



**AMRITA**  
VISHWA VIDYAPEETHAM  
UNIVERSITY

Established u/s 3 of the UGC Act 1956

**UNIVERSITY**

**RE-ACCREDITATION REPORT**

**PART – I**

Submitted to:

**NATIONAL ASSESSMENT AND ACCREDITATION COUNCIL**

P. O. Box. No. 1075, Nagarbhavi, Bangalore - 560 072

**December 2013**

# CONTENTS

## PART - I

Preface	3
A. Executive Summary	05
B. SWOC ANALYSIS	52
C. Profile of the University	70
D. Criterion-wise Inputs	
a. Criterion I - Curricular Aspects	98
b. Criterion II – Teaching, Learning & Evaluation	112
c. Criterion III - Research, Consultancy and Extension	146
d. Criterion IV - Infrastructure and Learning Resources	179
e. Criterion V - Student Support and Progression	196
f. Criterion VI – Governance, Leadership, & Management	226
g. Criterion VII - Innovative Practices	238
E. IQAC REPORT	248
F. Declaration by the Head of the Institution	

## PART - II

A. Evaluative Report of the Departments	
---	--

## Preface

*We are pleased to present this Re-Accreditation Report of Amrita Vishwa Vidyapeetham to NAtAc. From the time we received the "A" grade in 2009 subsequent to the 1<sup>st</sup> cycle of accreditation, we have collectively put in our best efforts, facilitated by the Internal Quality Assurance Cell (IQAc), to continuously progress in all aspects emphasized by NAtAc. It has been a collective effort involving dedication, love, inspiration, and integrity. NAtAc has provided a clear roadmap for the quality enhancement process. We have made sincere efforts to follow the road map, and we are hopeful that the success of our endeavors will come through clearly in this report.*

# Executive Summary & SWOC Analysis Report

## Executive Summary Report – Amrita University

Amrita Vishwa Vidyapeetham has had phenomenal growth ever since its inception in 2003, and this growth has continued past the first NAAC accreditation (with A grade) in 2009. Under the guidance of the university's Chancellor, Sadguru Sri Mata Amritanandamayi Devi (AMMA), who is one of the foremost humanitarian leaders of the world, the university's ascent has been remarkable by any standards: from 11,000 to 17,000 students enrolled, from 1400 to 1700 faculty members, from 96 to over 150 degree programs, and from around Rs. 44 crores (up to 2008) to over Rs. 180 crores (cumulative up to 2013) in research grants. The university has forged many international linkages and has appointed two Nobel Laureates (Lee Hartwell and R.K. Pachauri) as adjunct faculty.

Recognizing the immense talent, technical knowledge, dedicated faculty, and visionary leadership with a focus on service to society, the Government of India has awarded Amrita University numerous mission mode projects: AVIEW (Amrita Virtual Interactive E-learning World), Haptics-based vocational training and education for women's empowerment, Virtual Labs, MEDSIM, OLABS 2, Adaptive Learning & CCE (Comprehensive Continuous Evaluation), Academic ERP (Academic Enterprise Resource Planning), TIFAC-CORE for Cyber Security, TIFAC-CORE for Biomedical Engineering, National Knowledge Network (NKN) Global Classroom, National Pedagogy Project, etc.

AMRITA is a partner in various international bilateral governmental research programmes and initiatives, such as Indo-US Initiative (Cyber Security, Cyber Crimes, & Cyber Forensics), Indo-European Union (Erasmus Mundus, India4EU programs), Indo-Japan Initiative in Wireless Networks & Applications, Indo-Brazilian bilateral programme on Wireless Networks and Techniques with Applications to Societal Needs, Indo-Italy bilateral Science and Technology Co-operation in Robotics, and Indo-Brazil programme in Nanomaterials for Renewable Energy.

Based on the evaluation of all the campuses and programmes by a peer review committee, the university was accredited by National Assessment and Accreditation Council (NAAC) with 'A' grade in January, 2009.

Amrita Vishwa Vidyapeetham has also been ranked in the ivy league of Indian universities along with the top institutions in India like Indian Institute of Science, Bangalore; Tata Institute of Fundamental Research (TIFR), Mumbai etc. in the 2009 review of Deemed Universities constituted by the Ministry of Human Resource Development (MHRD) of the Government of India. AMRITA is placed in **Category A** in this review, which is popularly known in the media as the **Tandon Committee** report conducted by a high power committee consisting of reputed academicians.

These accomplishments have to be placed in the overall context of the university's vision and mission: "We envision a system, which is a healthy breeding ground for the sprouting, culturing, and dissemination of the whole

gamut of knowledge in a wholesome and holistic manner for the well-being of humankind.” The university’s mission is, “To provide value-based education and mould the character of the younger generation through a system of wholesome learning, so that their earnest endeavor to achieve progress and prosperity in life is matched by an ardent desire to extend selfless service to society, one complementing the other.” Thus, the university’s activities are based upon a deep understanding of our values and culture. This is in alignment with the educational outlook of our Chancellor, namely, “Education for life, not just education for a living.” The university is managed by a registered public charitable trust, the Mata Amritanandamayi Math, which has been recognized by the United Nations for its multifarious social, cultural, education, disaster relief, healthcare activities all over the world.

With this background, we now present a brief summary of the university’s structure, programmes offered, significant trends over the past five years (the report period), innovations & initiatives, and achievements & accomplishments at the university level, among the faculty, and among the students.

### **Courses and Programmes**

The university offers over 150 undergraduate, postgraduate and doctoral programmes in Engineering, Business, Medicine, Dentistry, Pharmacy, Nursing, Journalism, Biotechnology, Information Technology, Arts and Sciences, Health Sciences, Teacher Education, Microbiology, Hospital Management, Visual Media Studies, Mass Communication, Social Work, Nanosciences and Ayurveda.

### **Campuses**

The university has five campuses, spread across three states. They are:

- Kerala
  - Amritapuri (Kollam)
  - Kochi
- Tamil Nadu
  - Coimbatore
- Karnataka
  - Bangalore
  - Mysore

### **Constituent Schools**

The university consists of the following constituent schools:

- ❖ Amrita School of Engineering, Coimbatore
- ❖ Amrita School of Business, Coimbatore
- ❖ Amrita School of Ayurveda, Amritapuri
- ❖ Amrita School of Arts & Sciences, Amritapuri
- ❖ Amrita School of Engineering, Amritapuri
- ❖ Amrita School of Biotechnology, Amritapuri
- ❖ Amrita School of Arts & Sciences, Kochi
- ❖ Amrita School of Medicine, Kochi
- ❖ Amrita College of Nursing, Kochi
- ❖ Amrita School of Dentistry, Kochi

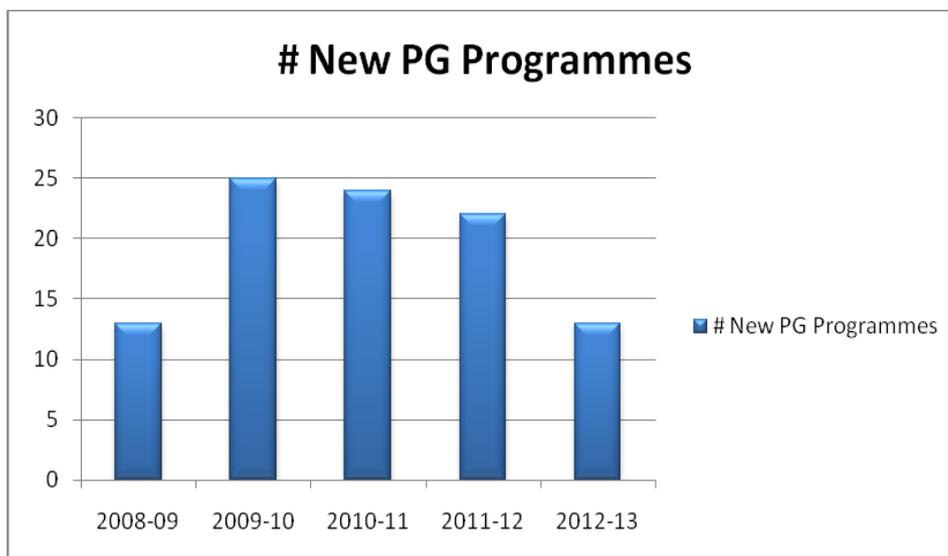
- ❖ Amrita School of Pharmacy, Kochi
- ❖ Amrita School of Engineering, Bangalore
- ❖ Amrita School of Arts and Sciences, Mysore
- ❖ Amrita School of Education, Mysore

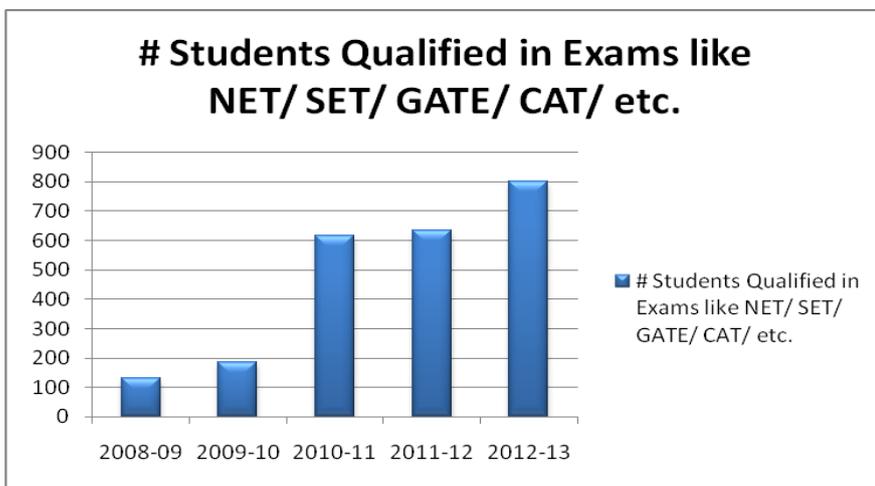
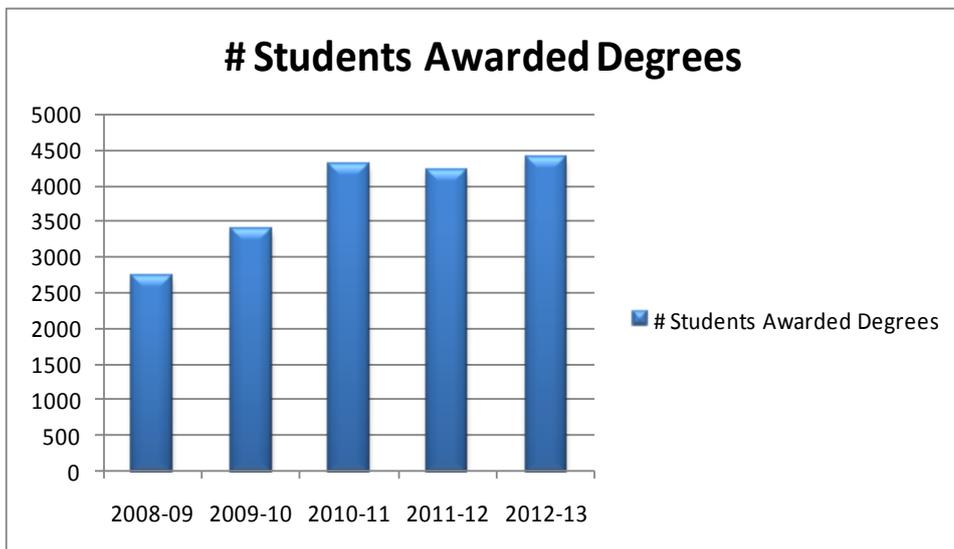
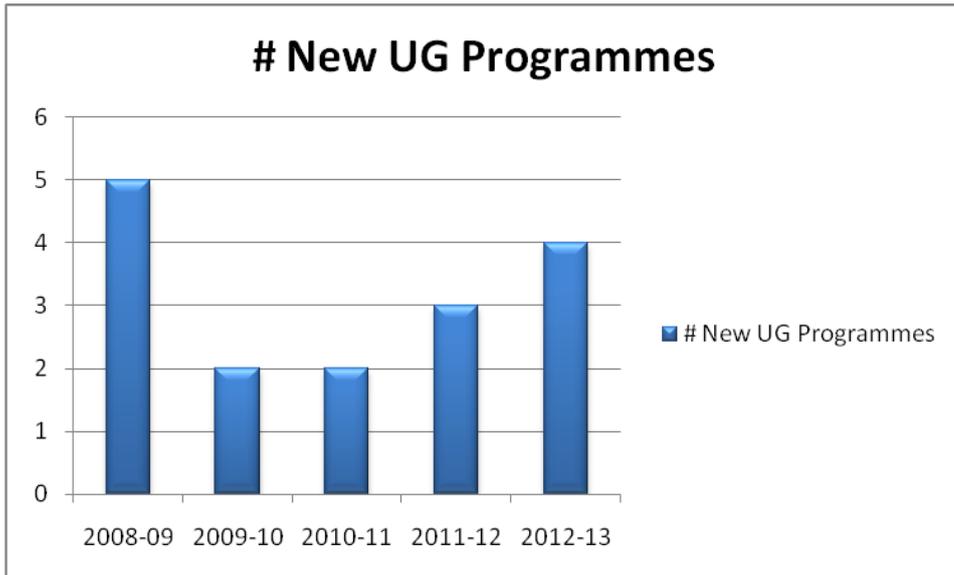
In addition to these schools, the university runs programmes directly through departments and centres, in Mass Communication, Business Management, Social work, and Nanosciences, which are not attached to the schools listed above.

### Basic Statistics & Infrastructure

The university had a beginning, in November 1994, as an Institute of Technology in the village of Ettimadai, at the foothills of Boluvampatty ranges of the Western Ghats in Coimbatore district of Tamil Nadu, with 120 students and 13 faculty members. Today, Amrita Vishwa Vidyapeetham spread over five campuses in three different states of India, has a student population of around 17,250 and a faculty strength of over 1700, conducting over 150 UG, PG, and Doctoral programmes. Presently, there are around 600 faculty members who hold Ph.D. or other highest degrees in their respective fields (e.g., DM) in the university, which is the best among private universities in India. The overall staff-student ratio in the University, which is about 1:10, is one of the best prevailing in the country and especially in the private universities. The university now has a total land area of about 1000 acres and built-up space of about 9 million square feet.

Some of the progressive trends over the past five years are presented below.





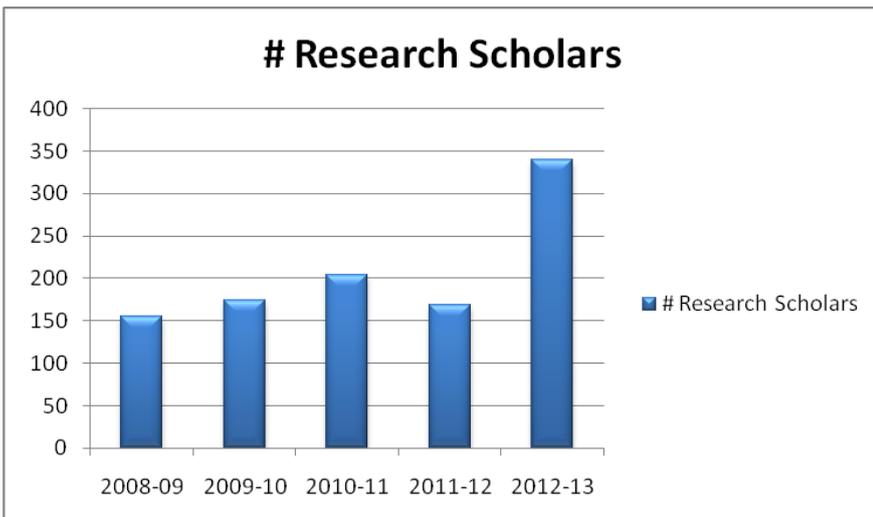
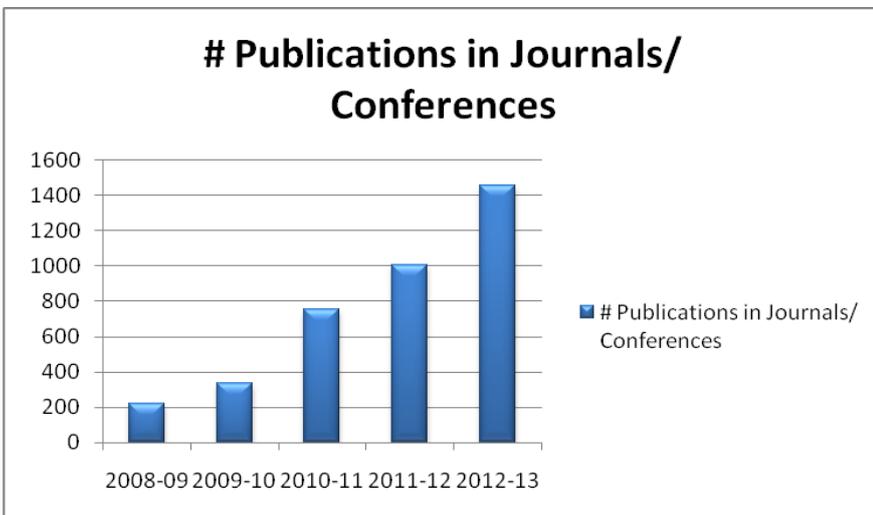
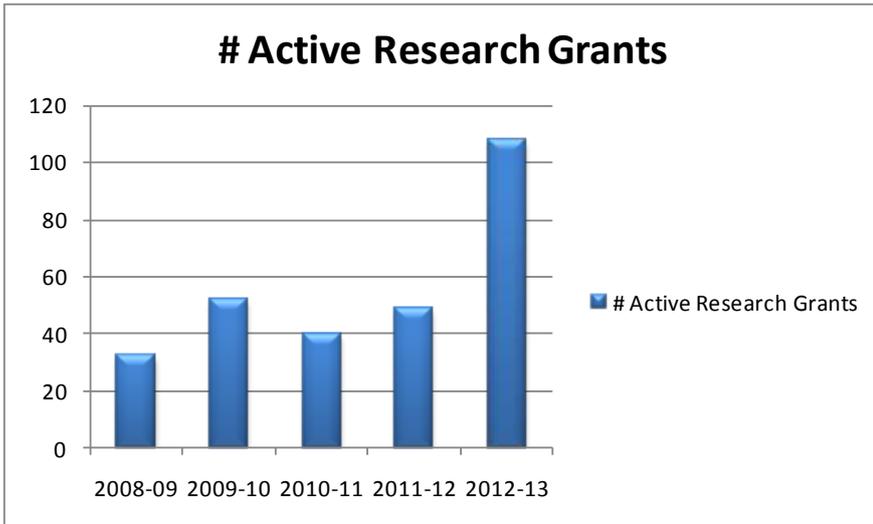
### Research Accomplishments

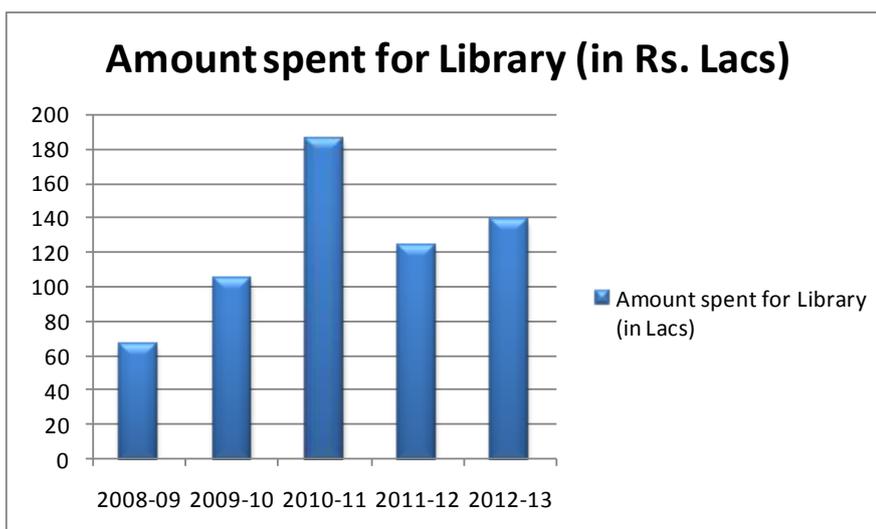
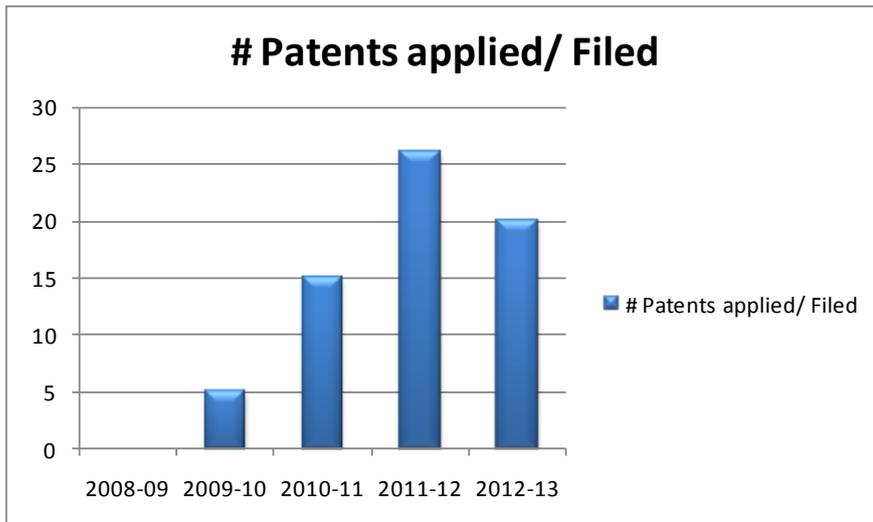
Only a small percentage of Indian higher educational institutions are active on the research front. India's share in terms of percentage of scholarly research publications is 3.5% which is a miniscule figure, when compared to USA or China.

With its aims set high, AMRITA has always given paramount importance to research. As directed by the Chancellor, AMMA, the research activities at AMRITA are directed towards societal, humanitarian, and community development, and relief. Many centres of excellence have been started in cutting-edge areas like Wireless Networks & Applications, Cyber Security, Computational Engineering & Networking, Virtual Labs, E-learning, Haptics, Educational Technologies, Nanosciences & Molecular Medicine, Biomedical Engineering, Cancer Prevention & Cure, Biostatistics, Environmental Sciences, etc., with the support of major national laboratories, industry leaders and agencies like TIFAC, DST, ICMR, ISRO, DRDO, DBT, DIT, DRDO, Microsoft, Hewlett Packard, Media Lab Asia, Infosys, MDS Pharma, Biocon etc. AMRITA is also a partner in the Indian government's Ministry of Human Resource Development's National Mission for Education using Information and Communication Technology (ICT) for various national projects in haptics, virtual labs, Educational Resource Planning, Natural Language Processing and interactive e-learning systems along with Indian Institutes of Technologies and Indian Institute of Science.

The faculty members of AMRITA have published more than 150 books, 300 book chapters, and 3000 research papers in reputed international and national journals in the past ten years. AMRITA has attracted grants from various Governmental and private funding agencies to the tune of more than Rs. 180 crores in the past ten years. There are more than 100 major funded projects underway with government and private agencies. AMRITA has also been awarded, or has applied for, fifty major patents and inventions in the past few years which include Adaptive and Automatic Insulin Pump, Wireless Telematics, Virtual Private Network (VPN), Amrita Hospital Information System (AHIS), etc.

A summary of information related to progress in the research area is presented in the graphs below.





#### [Research for Societal and Humanitarian Relief](#)

The research direction of Amrita University is to engage in technologies, projects, and solutions for societal and humanitarian relief as also to

conceptualize and develop low-cost technologies to solve scientific and societal challenges facing the world. These include pressing problems and issues like sustainable development, water scarcity, waste disposal, environmental protection, renewable energy etc. In fact, one initiative being pursued is forming inter-disciplinary teams from medical, engineering, management, social work, health sciences, biotechnology, nanotechnology, etc., to tackle issues in the thrust areas of Water, Waste, and Energy, with a special focus on the transformation and development of India's villages.

Some of AMRITA's research and development breakthroughs focused on Societal and Humanitarian objectives are as follows:

- **AMRITA's Centre for Nanosciences and Molecular Medicine** is India's first centre focusing on the use of nanotechnology for biomedical and biotechnology applications. This centre is recognized today as a leader in Nanotechnology, Molecular medicine and Solar Cell research. The Centre also hosts a Nano Solar Centre for Excellence which focuses on innovative product development in photovoltaics and storage devices using nanomaterials, which are primarily aimed at solving energy problems. Another thrust is to develop nano-technology in biomedical implants and low-cost biomedical devices.
- **AMRITA Center for Wireless Networking and Applications** has developed India's first-ever wireless sensor network system for predicting landslides at Munnar in Idukki district in Kerala. The system uses wireless sensor technology to provide advance warning of an impending landslide disaster, facilitating evacuation and disaster management. This system is being suitably modified to predict disease outbreaks, environmental pollution as well as other calamities. The Government of India has shown interest to deploy this system in all landslide prone areas including the Himalayas and the North-East Region, and tests are already in progress.
- **Amrita TIFAC-CORE for Biomedical Engineering Research & Amrita School of Biotechnology** formed an inter-disciplinary project team of researchers and successfully developed a low-cost semi-automated insulin pump for diabetic patients. This device, about the size of a mobile phone, can be attached to a patient's body, and in combination with glucose sensors (also being developed at AMRITA) would help in monitoring the glucose level in a patient's body and delivering the right dose of insulin. Efforts are on to have a commercial partner and make the device available at a fraction of the current cost of such devices in India.
- **AMRITA School of Biotechnology** has research programmes focused on preventive and therapeutic innovations. The research programmes span a wide spectrum of areas including Cell Biology, Cancer Biology, Wound Healing, Computational Neuroscience, Proteomics, Neurophysiology, Phytochemistry, Analytical Chemistry, & Venomics.
- **AMMACHI Labs** (Amrita Multi Modal Applications Using Computer Human Interaction), a research centre of AMRITA, partly supported by the United Nations (UN) is a centre of technological innovation breaking new ground in the field of computer-human interaction, developing applications designed to improve quality of life for the least fortunate among us. Even as India's economy booms, and the demand for skilled workers rises, vocational training in India is effectively paralyzed by social

stigma, budget constraints, and inadequate number of trainers and materials. The approach that AMMACHI Labs is taking to provide training is unique. It allows people from all walks of life, especially women, to get trained in various trades like plumbing, construction, etc., with proper application of modern technology. AMMACHI Labs aims to augment skill development and life enrichment education thereby contributing to women's upliftment and empowerment.

- In line with the trend of today's classrooms becoming virtual, global and personalized. **AMRITA E-Learning Lab** has developed a unique E-learning system, A-VIEW, "Amrita Virtual Interactive E-Learning World", which is cutting-edge video conferencing software, customized explicitly for Universities. A-VIEW is the preferred system for this national mission on education using ICT of the Government of India and is being currently deployed at all 600 universities and 30,000 colleges all over India free of cost. This system addresses the most pressing issue of higher education in India today, namely, the shortage of highly qualified teachers. A-VIEW brings classroom teaching, live from expert teachers and resource persons at reputed institutions as well as foreign universities to cater to the interested students at numerous locations all over India.
- The **Virtual Labs research centre** at Amrita focuses on intelligent development of virtual laboratories with state-of-the-art computer simulation technology to create real world environments and problem handling capabilities is required to bridge the gap between institutions or industries that retain the physical laboratory and distantly placed economically challenged educational institutions. A virtual laboratory is a tool for distance learning and/or experimentation that allows people to share knowledge, data, voice, video, tools, and many other resources. Amrita lab courses richly rely upon new up-to-date content and various techniques that require a new synergy of knowledge and experimental implementation. Hence a new kind of experimental science that can be brought as a virtual simulation based laboratory is proposed in this part of the proposal. As key part of the project, the Biotech school uses mathematical techniques in biology to study, hypothesize, and demonstrate complex biological functions. Other labs in biotechnology, physical and chemical sciences, nanoscience are the major contributions from Amrita. Amrita University jointly participates with IIT Delhi, IIT Kanpur, IIT Bombay, IIT Madras, IIT Kharagpur, IIT Guwahati, IIT Roorkee, IIIT Hyderabad, and Dayalbagh University.
- AMRITA University has been awarded mission-mode projects in the Government of India's **National Knowledge Network (NKN)** mission (under the Global Classroom group). AMRITA is developing and deploying a multi-site, multi-modal, multi-channel, high-definition, interactive and immersive classroom experience - a university without walls and borders. This will facilitate various institutions linked to the NKN to share their strengths and best practices. It will also link to several international institutions worldwide to build a co-operative entity for higher education and research. The classroom uses multiple audio and video streams with multiple perspectives, which are linked together real-time to create a seamless classroom experience.

- **Amrita Institute of Medical Science (AIMS)**, the hospital attached to the university, is a preferred location for multinational organizations to function as a centre in clinical trials. Numerous research protocols have been cleared/ongoing out of which around twenty are part of international clinical studies sponsored by multinational pharmaceutical organizations. National organizations like ICMR, Department of Biotechnology, Department of Science and Technology, and state level organizations like Kerala State Council of Science, Technology and Environment, CUPRD – Cochin, and State AIDS Control Society, are currently working with and supporting AIMS in various research programmes.
- **Centre for Cyber Security** is credited with introducing the first post graduate Cyber Security programme, M.Tech. in Cyber Security in India, as a TIFAC Centre of Excellence and Relevance (CORE). The centre is engaged in various cyber and information security projects of national importance with several government agencies. In addition to its strength in cryptographic systems and protocols, the centre has expanded into cyber security systems and networks with focus on cloud security, healthcare security, personal security devices, Internet of things, and Cyber Physical systems.
- **Centre for Computational Engineering & Networking** is a multi-disciplinary centre of excellence focusing on wireless sensor networks, software radio, natural language processing, computational drug designing, and advanced signal processing methods, like wavelet theory. The centre is pursuing research projects of national importance that investigate socially relevant issues such as plagiarism detection and language translation. A text book written by one of the faculty, was one of the few technical books from India translated into Chinese.
- **Centre for Research in Advanced Educational Technologies (CREATE)** applies innovative digital solutions to provide accessible and affordable educational technologies and instructional software for primary and secondary schools and builds solutions for universities with a focus on personalized assessment and learning, like National Faculty Expertise System, computer-based medical simulation software, language learning using immersion, and research grant management system, with a focus on personalized assessment and learning. An Intelligent Tutoring and Adaptive Assessment programme has been deployed in over 45 Indian schools in rural and small city neighborhoods. Indian Government's Central Board for Secondary Education (CBSE) has recommended the Online Labs (OLabs) for school experiments for all schools affiliated to this board, which is one of the largest in India.
- A **Centre of Excellence for Advanced Materials and Green Technologies** has been sanctioned by MHRD, with focus on R&D in frontier areas such as pyrolytic gasification, micro-reactors & heat exchangers, electrochemical sensors for detection of heavy metal impurities in water, green construction materials, etc.

Some of the futuristic research & development challenges being addressed at the university include development of nanomedicine applications, mobile applications for health care monitoring, alternative energy sources into miniaturized components for use in rural areas, nanostructured low cost

materials for water purification and sensors to test the quality of the water, bio-sensors, robotics, haptics technology for surgical assistance, medical simulation and training, etc. Faculty members who are seeking fulfillment through research get the unique opportunities to actively participate in social outreach, inspiration for which flows directly from the Chancellor of the university, AMMA.

### **Reverse Brain Drain and Selfless Service**

Historically, India has been plagued by brain drain, which has seen top professors, technologists, scientists, doctors and professionals immigrating to western nations for greener pastures. Many of them have left India early in their career for better facilities to pursue their professional and research interests. However, inspired by AMMA, several top ranking professors and doctors from the world's best universities like University of California, State University of New York, Berkeley, Harvard, Wharton, Kellogg, etc., have started returning, to join Amrita University. AMRITA offers the ideal ambience for them to return and pursue their interests towards developing technologies, solutions and services, aimed at addressing various pressing problems in India. AMRITA has therefore being influential in bringing about a significant Reverse Brain Drain.

One unique thing at AMRITA, perhaps not found in any university in the world is that inspired by AMMA, hundreds of faculty, doctors, and researchers are engaged in selfless service in the university and hospital, at all levels, including those among the senior administration.

One world-class technology developed primarily as a result of volunteering services is the AMRITA Hospital Information System (HIS), which transformed the 1450-bed super specialty Amrita Institute of Medical Sciences into an all-digital hospital. Today many hospitals across India in Punjab, Maharashtra and other states like BARC and JJ Hospitals in Mumbai, Punjab Medical Sciences, and BHU Hospital, are adopting and deploying this system. Today, AMRITA HIS competes with similar packages developed by multi-national companies like Siemens.

### **Convocation**

Eminent personalities who have addressed the convocation of AMRITA include Nobel Laureates, Dr. Martin Chalfie and Dr. Leland Hartwell; Dr. D. Purandeswari, the then Minister of State for Human Resource Development of Government of India; Dr. Gururaj Deshpande, renowned Silicon Valley entrepreneur and Co-Chair of the US President's National Innovation Council; Bharat Ratna Dr. C.N.R. Rao, eminent scientist and former director of Indian Institute of Science; Mr. S. Ramadorai, Advisor to Prime Minister of India on Skill Development and Vice-Chairman of Tata Consultancy Services (TCS); Mr. K. Venkataramanan, CEO, Larsen & Toubro; Mr. Kris Gopalakrishnan, CEO of Infosys; Dr. Srikumar Banerjee, Chairman, Atomic Energy Commission of India; Dr. T. Ramasami, Secretary, Department of Science and Technology of Government of India (GOI) and Mr. R. Chandrashekhar, Secretary, Ministry of Information Technology of GOI. The 10<sup>th</sup> convocation of AMRITA in 2013 saw 4385 candidates graduating, including 24 Ph.D.s.

During the 2012 convocation of AMRITA, Dr. D. Purandeswari, the then Minister of State for Human Resource Development of Government of India complimented AMRITA's efforts in higher education and research. She opined, *“From a humble beginning of around 120 students, Amrita University has grown from strength to strength and today it has 17,000 students enrolled in various disciplines. We appreciate and acknowledge the yeoman service that Amrita University is doing, to impart quality education to Indian children, which has been a focus area for our Government.”*

### **International Initiatives**

AMRITA has active tie-ups and collaborations with over 75 universities in USA, Europe, Australia, Japan, etc.

A Memorandum of Understanding was signed in 2005 between AMRITA and various US Universities, some of which are ranked among the best universities in the world, like Harvard, Purdue, State University of New York (SUNY) at Buffalo, Yale, Princeton, Columbia, Berkeley, Michigan, Maryland, University of California etc. for faculty and student exchange, collaborative programmes, research and cross-continental projects, centres of excellence and broadcast of distinguished lectures using EDUSAT to around 50 institutions and universities in the country. In the last eight years of this tie-up, there have been 15 full-fledged courses, numerous research projects, short-term courses and over 750 distinguished visitors. The then President of India, Dr. A.P.J Abdul Kalam launched the Indo-US Inter-University Collaborative Network for Higher Education and Research in New Delhi on 8 December, 2005. Earlier, on 20 July, 2005, five U.S. Universities including the University of California, campuses at Berkeley and San Diego, Carnegie Mellon University, Cornell University and State University of New York at Buffalo had inked the agreement during the visit of the Honorable Prime Minister of India, Dr. Manmohan Singh to Washington DC.

A striking example of the impact of the university's dynamic efforts towards launching international initiatives is the following: Dr. Lee Hartwell, Nobel Laureate, accepted an appointment as Adjunct Professor at Amrita University. Dr. Hartwell received the Nobel Prize in Physiology and Medicine for his discoveries of a specific class of genes that control the cell cycle, and therefore all aspects of cell growth and division, providing important clues toward understanding cancer.

AMRITA has completed a major European Commission funded project which resulted in the development of India's first Wireless Sensor Network system for landslide detection. AMRITA also has joint research projects, collaborative programmes and tie-ups with Vrije University Netherlands, EVRY France, Barcelona Tech Spain, University of Milan, University of Twente, Technical University of Munich, University of Groningen, Uppsala University, Royal Institute of Technology KTH-Stockholm Sweden, University of Montpellier France etc. Extensive faculty and student exchange programmes through Erasmus Mundus programme of the European Commission is also underway with over 200 faculty and students from

AMRITA deputed to various European universities in United Kingdom, Ireland, Italy, Sweden, Germany, Finland, Bulgaria and Netherlands for academic and research assignments in the last few years with full financial assistance. AMRITA also has collaborations with Australian Universities like Deakin University and Japanese universities like Doshisha, Tokyo etc. Twinning programmes are now underway with various foreign universities like Vrije University, Netherlands; State University of New York (SUNY), Buffalo; KTH-Royal Institute of Technology, Stockholm; University of New Mexico; Polytechnic University of Catalonia (UPC), Barcelona, etc.

### **Societal Commitment**

All the students of Amrita University have ample opportunities for orientation in yoga, meditation, and cultural education. Integrated Amrita Meditation (IAM) technique helps them achieve holistic development of mind and body. The students have also demonstrated their social commitment and community engagement by participating in disaster relief and rehabilitation activities after the Gujarat Earthquake in 2001; Tsunami relief operations in Tamil Nadu and Kerala in 2005-2006, flood relief operations in Bihar in 2009 and Karnataka in 2010. Since 2010, AMRITA students in all campuses have played an active role in the Amala Bharatham – Clean India awareness drive and campaign, in the communities, localities, and cities, near the respective campuses, as well as wholeheartedly participating in the cleaning of the Sabarimalai pilgrimage site, before and after the pilgrimage season, for the last three years.

### **Amrita University Management System**

Academic administration at AMRITA is completely automated using In-house developed academic ERP system, AUMS (Amrita University Management System) for academic and administrative purposes. Access to student and parent portals of AUMS for student performance & attendance result in increased rapport with stakeholders.

AUMS has the following modules:

- Academic Administration system which encompasses admission, timetable, course registration, placement management, hostel management, inventory and purchase management, facilities management, evaluation, grading, certificate generation, finance, budgeting and fee collection
- E-learning system
- Student relationship management systems
- Library Automation system
- Content Management system
- Alumni Management system

### **Virtual Campus**

Amrita Vishwa Vidyapeetham has the unique distinction of being the nation's first of its kind – fully interactive, multi-disciplinary, multi-media, virtual campus without geographical limitations, with all its campuses inter-linked. The satellite network for education and research that links all the campuses of the university has facilitated leading experts to have academic interaction live from a single centre to students, academicians, and researchers at other

campuses, done through state-of-the-art e-learning studios in all campuses. These studios are equipped with 130 seats for classroom instruction, 7 days a week, using satellite link provided by Indian Space Research Organization (ISRO).

### **Industry-Academia Interaction**

With a view to foster the employability of engineering graduates, Amrita Vishwa Vidyapeetham has entered into a number of Memoranda of Understanding with various companies and organizations. Setting up of Innovation Laboratory by Cognizant, Embedded Systems Laboratory by Microsoft; Best Student Project Awards and Institution of German Language Chair by Tata Consultancy Services (TCS), and Infosys Campus Connect programme for foundation training programmes, are some examples of corporate involvement for elevating the process of learning at AMRITA. Memoranda of Understanding with National Aerospace Laboratories (NAL), Tata Consultancy Services, Automotive Test Systems, Cognizant, Robert Bosch, and Infosys, have been signed in this direction. Organizations like L&T, Honeywell, Caterpillar, Microsoft, NAL, ISRO, Cognizant, HCL, Hewlett Packard, etc., have been regularly offering internships to our students. Various companies are also offering Faculty Development Programmes (FDP) for the benefit of the faculty members.

### **Super-Specialty Hospital**

The 1400-bed super-specialty hospital, Amrita Institute of Medical Sciences (AIMS) attached to the university, is a unique, state-of-the-art institution offering subsidized and free treatment of over Rs. 25 crores per year, to poor and needy patients. AIMS' extensive infrastructure comprises 60 departments, 24 modern operating theatres, 210 Well-equipped Intensive Care beds, a reference diagnostic clinical laboratory, including advanced Molecular Biology and Cytogenetics Labs, a state-of-the-art Diagnostic Imaging Centre and Research Facility. Patient care is enhanced by a fully computerized and networked Hospital Information System and a fully digitized Radiology Department. Since 1998, over 7.6 million patients have been treated of which 2.6 million received completely free treatment. Annual patient turnover touches an incredible figure of over 6,15,000 outpatients and nearly 54,800 inpatients. AIMS is among the top five hospitals in the country in Cardiac Care and Cancer Treatment, clinical programmes and education. Many Amrita Medical Education and clinical programmes like Endocrinology, Neurology, Neurosurgery, Pediatrics, Respiratory Disorders, Digestive Disorders, Ophthalmology, Kidney Disease, Ear, Nose & Throat, Urology, Psychiatry and Gynecology are rated among the top 10 in India. Undergraduate, Postgraduate and doctoral Students in healthcare get the opportunity to do internship in this super-specialty hospital, whose facilities are on par with the best hospitals in India like AIIMS, CMC Vellore, etc.

AIMS hosts one of the largest telemedicine networks in India with the support of Indian Space Research Organization (ISRO). The telemedicine service is connected to 60 major hospitals in India and 9 international centres, including remote locations in India like Lakshadweep, Leh etc. This is also one of the five centres selected by the Ministry of External Affairs, Government of India

for providing telemedicine, tele-consultations, tele-surgery and Continuing Medical Education (CME) and distant medical education programmes all over the world. There are extension centres and community centres of the hospital in various places like Mysore, Amritapuri, Njarackal, Kaloore as well as remote places like Kalpetta, Lakshadweep, Andaman and Nicobar Islands etc. Regular medical camps are organized all over India as well as tribal areas for the benefit of poor and aged people. Palliative home care services as well as special camps like dental or cleft lip are also organized. SOS medical camps and rehabilitation programme are organized on tsunami and earthquake calamities. Annually more than 150 medical camps are organized.

### **Corporate & Industrial Relations**

The Directorate of Corporate and Industrial Relations (CIR) is committed to providing opportunities to students to develop their professional skills through various activities, with the help of experts from within and outside.

The Learning and Development wing of CIR imparts objective oriented training to the students to improve their soft skill, communication skills, aptitude skills, and core competencies. Apart from this, preparation for competitive examinations like GATE, CAT, SSB, Civil Service Examinations, and Foreign Languages are also given due importance to add value to the academic and career goals of the students.

CIR has been able to establish excellent rapport with senior officials of Corporates, Government and semi Government undertakings through regular visits and other means of communication. Relentless efforts in this direction have paid rich dividends and MoUs have been signed with many companies and research organizations. Faculty Development Programmes organised by CIR enhance the technical knowledge & skill of the faculty and strengthen Industry – Academia relationship.

In addition, CIR also works with corporates to ensure that students are placed in companies of their choice and interest.

## **THE CHANCELLOR OF AMRITA VISHWA VIDYAPEETHAM**

AMMA is recognized as one of the foremost humanitarian and spiritual leaders in the world today with several global recognitions like Gandhi King Peace Award, James Parks Morton Interfaith Award. She regularly addresses global fora such as United Nations Alliance of Civilizations Regional Consultations for Asia-South Pacific, United Nations Global Peace Initiative of Women Religious & Spiritual Leaders and World Parliament of religions.

AMMA, Chancellor of Amrita Vishwa Vidyapeetham, was awarded honoris causa, a State University of New York (SUNY) Doctor of Humane Letters degree, at a conferral ceremony on May 25<sup>th</sup> 2010, in Slee Hall at the University of Buffalo, North Campus (USA). AMMA's SUNY honorary degree recognizes her extraordinary humanitarian service and commitment to expanding educational opportunities and international cooperation.

AMMA says, "Love is my religion." This is the spirit with which the Chancellor guides the quality improvement efforts of Amrita Vishwa Vidyapeetham. The university continuously provides opportunities to remind all the staff and students of this spirit, via a symbiotic integration of cultural, spiritual, academic, and professional activities organized through the year.

### **About AMMA**

The Chancellor of Amrita University, Sadguru Sri Mata Amritanandamayi Devi, has been the driving force and the key to its remarkable success. She has been an inspiring influence, steering the university to achieve every new heights in research, always with societal benefits. A very brief glimpse into AMMA's global presence is given below. Her impact can be partly gauged from noting that she has given darshan to over 33 million people across the world and has been invited to address global fora.

- **2012, Shanghai:** AMMA spoke on, "Co-existence and Engagement Between Cultures", for the conference on, "Harmony through Diversity and Dialogue", for the United Nations Alliance of Civilizations Regional Consultations for Asia-South Pacific.
- **2010, Buffalo, New York:** AMMA was conferred a honorary doctorate in humane letters by the State University of New York (SUNY). SUNY bestowed the doctorate upon AMMA in recognition of her tireless efforts on behalf of global peace, for her commitment to education and for the far-reaching impact of her charitable organizations in relieving poverty and human suffering in India and around the world. SUNY is one of the largest university systems in the USA with 64 campuses. In the University's 164 year history, only two other world leaders (with His Holiness the Dalai Lama being one of them) have been bestowed with this award, the University's highest.
- **2006, New York:** AMMA was presented with the Interfaith Centre of New York's 4th Annual James Parks Morton Interfaith Award after speaking on the topic "Understanding and Collaboration between Religions".

- **2005, Cannes:** A film on AMMA titled, “Darshan – The Embrace”, by renowned filmmaker Jan Kounen, was screened at the prestigious Cannes Film Festival.
- **2004, Barcelona:** AMMA delivered the Keynote Address at the Closing Plenary Session of the World Parliament of Religions.
- **2003:** In celebration of AMMA’s 50<sup>th</sup> Birthday celebrations (Amritavarsham 50), over 500,000 people including representatives from 191 countries gathered at Kochi for four days to pray for world peace and harmony.
- **2002, Geneva:** AMMA delivered the Keynote Address at the Global Peace Initiative of Women Religious & Spiritual Leaders at the United Nations (UN), after receiving the prestigious Gandhi-King Peace Award. Past winners of the award include former South African President late Nelson Mandela, Secretary General of the UN Kofi Annan, and the world renowned primatologist, Dr. Jane Goodall.
- **2000, New York:** AMMA delivered the Keynote Address at the Millennium Peace Summit, UN General Assembly.
- **1995, New York:** AMMA addressed the Interfaith Celebration at the 50<sup>th</sup> Anniversary of the UN.
- **1993, Chicago:** AMMA spoke at the World Parliament of Religions, 100<sup>th</sup> Anniversary, exactly hundred years after Swami Vivekananda gave his historic address.

## FACULTY ACHIEVEMENTS

### International Awards & Recognitions

- Senior faculty and doctors at the health sciences campus like Dr. Sudhindhran N. S., Professor of GI Surgery have been conferred **FRCS**.
- Dr. Shantanu Bhowmick, Professor of Aerospace Engineering at Coimbatore campus has secured **Research Award of Brain Pool of Korea** in 2013.
- Dr. Krishnakumar R., Clinical Assistant Professor in the Department of Orthopaedics at the Amrita School of Medicine was recently selected for two prestigious international travel fellowships. He became the first Indian citizen to receive the **SICOT Danish Travelling Fellowship in Spine Surgery** as well as the International Group for Advancement in Spinal Sciences (**IGASS**) **International Travelling Fellowship**, both within a span of one year.
- Heads of State, Ministers, World Bank Managing Director and over 2,600 leaders, experts and policy makers from around the world convened for one common cause – Surviving Natural Disaster at the World Reconstruction Conference and Global Platform for Disaster Risk Reduction conference held in Geneva, Switzerland during May 8-13, 2011 Representing Amrita at the world’s foremost gathering endeavoring to reduce disaster risk, were Dr. Maneesha V. Ramesh (Director of the Amrita Wireless Network and Applications Research Centre) and Prof. Bhavani Bijlani (Head - Amrita Multi Modal Applications Using Computer-Human Interaction Lab) who shared Amrita’s commitment, investment and advances in disaster preparedness.
- The 2009 World Congress in Computer Science, Computer Engineering, and Applied Computing (WORLDCOMP’09) is one of the world’s largest annual gathering of researchers. Over twenty international conferences such as those on Bioinformatics, Internet Computing, Security, Computer Graphics, Wireless Networks are all conducted simultaneously so as to promote interdisciplinary exchange of ideas. The conference organizers have invited Amrita’s Dr. Maneesha Ramesh to chair two sessions in the International Conference on Wireless Networks. Dr. Maneesha leads Amrita’s Indo-European research centre for wireless networks.
- An international workshop was conducted in Bangkok, Thailand during December 18 – 20, 2009. Amrita’s Dr. Maneesha Ramesh was one of only two institutional representatives from India, invited to attend. This invitation-only workshop on, “The Establishment and Sustenance of a Network for Education and Research in Disaster Risk Management”, in South-East Asia was attended by all key players from Asia.
- Amrita’s Dr. S. Thirumalini became the second person from India to be honored with the **SAE Ralph R. Teetor Educational Award**, in Mar 2010. She was chosen along with six other distinguished professionals world-wide for the 2010 awards. In April 2010, Dr. Thirumalini travelled to the SAE 2010 World Congress in Detroit, Michigan, where she received the award. She joined 800-odd engineering educators from over 200 universities world-wide that have received the award since its inception in 1953.

- On March 5, 2010, Dr. K. K. Haridas of Amrita was conferred the title of **Fellow of Royal College of Physicians**, Ireland in Dublin. He was one of seven recipients world-wide to have received the honor this year. Dr. Haridas joined Amrita in 1998, when the super-specialty hospital Amrita Institute of Medical Sciences was inaugurated in Kochi. He was given the responsibility of leading Amrita's Heart Institute.

### National Awards & Recognitions

- Marking a notable achievement in the history of the young Amrita Vishwa Vidyapeetham, its Dean of Research, Dr. Shantikumar Nair received the prestigious **National Research Award** from the Ministry of Science and Technology in New Delhi on February 28, 2011. This award given to one scientist in India every year was bestowed upon Amrita's Dr. Nair for his spectacular contributions to the emerging field of nanosciences and nanotechnology. The award was handed over to Dr. Nair by Professor C. N. R. Rao, Honorary President of the Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR) and Scientific Advisor to the Prime Minister of India.
- **NABARD Rural Innovation Award** for Amrita: Dr. Maneesha V. Ramesh, Director, Amrita Centre for Wireless Networks and Applications received the Runners-Up Award for Rural Innovations from National Bank for Agriculture and Rural Development (NABARD). NABARD chose Amrita's Real Time Landslide Monitoring and Detection System that was deployed in Munnar, Kerala in 2009 from among thirty other short-listed innovations in the category of Academic/Research Institutions for the honor. Dr. Maneesha received the award from Shri. P. Chidambaram, Honorable Union Finance Minister on October 17<sup>th</sup> 2012, in a ceremony organized at the Municipal Convention Centre in New Delhi, on behalf of the Amrita Centre for Wireless Networks and Applications. There are five categories in which NABARD invites nominations viz. Public Sector/Government, Private Sector, Academic/Research Institution, NGO/Trust and Individual. This year, over 1400 entries were received in the five categories combined.
- Amrita is proud that our Dean of Research, Dr. Shantikumar Nair, joined luminaries such as Mr. Narayana Murthy, founder of Infosys Technologies and Dr. Kasthuri Rangan, former chairman of ISRO, at **CNN-IBN's Face the Nation programme** hosted by veteran journalist Sagarika Ghose, on Jan 6th 2011.
- **Innovative Young Biotechnologist Award** for Amrita Faculty: In June 2013, Dr. Manitha Nair, Assistant Professor, Amrita Centre for Nanosciences and Molecular Medicine, Kochi, received the prestigious Innovative Young Biotechnologist Award. Instituted by the Department of Biotechnology, under the Ministry of Science and Technology, the award is given every year to outstanding young scientists in India to undertake innovative research in the area of biotechnology. The award carries a cash prize of Rs. 3,00,000 as well as additional financial support for research for up to three years. Dr. Manitha was selected for the award in recognition of the potential of her work in the area of Bone Tissue Engineering.

- Prof. Sudhakar Achath from Amrita was awarded the Association of Indian Management Schools (AIMS) **International Distinguished Service Award** 2010, at the Eighth AIMS International Conference conducted at IIM-Ahmedabad in April 2011.
- **Energy Conservation Awards** are given out in Kerala every year by the State Government's Energy Management Centre, in order to encourage and recognize energy conservation activities in the state. In 2009, Amrita's Dr. K. K. Sasi was selected to receive a commendation certificate by the award committee for his research and innovation efforts. Dr. Sasi is Professor and Vice-Chair of the Department of Electrical and Electronics Engineering at the Amrita School of Engineering at Coimbatore. Dr. Sasi received the award from the Electricity Minister of Kerala, Shri. A. K. Balan, at a function organized in Kannur to commemorate the National Energy Conservation Day on December 14th. He was one of two individuals selected state-wide, to be honored in the awards' "Research and Innovation" category.
- Amrita's Dr. V. Balakrishnan was honored with a **Lifetime Achievement Award** by the Indian Society of Gastroenterology in 2009. One of two individuals selected for this honor, Dr. Balakrishnan and his colleague, Dr. Habibullah, were India's first DMs in Gastroenterology. The award was presented to them at the Annual Conference of Gastroenterology, India's largest gathering of physicians and researchers, in the field of Gastroenterology, Hepatology, Endoscopy and Gastrointestinal Surgery. This year marked the golden jubilee celebrations of this annual conference.
- Prof. Sudhakar Menon Achath of the Amrita School of Business was chosen this year by the award jury for the **Dewang Mehta Best Teacher Award** instituted in the memory of the late NASSCOM chief. The jury honored Prof. Achath with the award for Operations Management.
- Amrita School of Pharmacy's Dr. B. Prabha Rao, was honored with the **Bharat Shiksha Ratna Award** on January 18, 2010 during the 30th National Seminar on Individual Achievements and National Development organized by the Global Society for Health and Educational Growth.
- On May 4<sup>th</sup> 2010, Dr. K. S. Balaraman, Distinguished Professor of Chemical Engineering and Material Sciences at the Amrita School of Engineering in Coimbatore, was in Mumbai to receive an award for outstanding achievement at the World Expo 2010. Dr. Balaraman was one of the few individuals chosen from all over India to receive the 2010 **Leadership and Excellence Awards**. He was felicitated for his achievements and contributions in the energy conservation sector.
- Dr. Deepthy Menon, Associate Professor at the Amrita Centre for Nanosciences and Molecular Medicine, was chosen for the prestigious **BOYSCAST fellowship award**, in Mar 2010. The BOYSCAST (Better Opportunities for Young Scientists in Chosen Areas of Science and Technology) fellowship, instituted by the DST is awarded each year to select Indian scientists for conducting advanced research in overseas research institutes of their choice.
- Mr. Prashant R.Nair, Vice-Chairman – IT, Amrita School of Engineering, Coimbatore has secured the Computer Society of India (CSI) **Academic Excellence Award** in 2011 and 2013.

- Dr T. K. Sindhu, Associate Professor in the Electrical and Electronics Engineering Department of the School of Engineering at Coimbatore was selected to receive the **Young Engineers Award from the Institution of Engineers of India (IEI)**. Every year, IEI selects individuals who have excelled in engineering research and technology development and transfer for these Young Engineer Awards. Many author the best papers published in their journals.
- Dr. L. Srinivas, a second year fellow in the Department of Pediatric Cardiology at Amrita School of Medicine, Kochi, won the **AV Gandhi Award for Excellence in Cardiology** in April 2009. The award carries a citation, a gold medal and a cash award of Rs. 1 lakh for the candidate and Rs 50,000 for the department.
- Dr. Nayana Rao from the Amrita School of Ayurveda was honored with the **Rashtriya Chikitsak Ratan Award** in June 2009. Translated as the, “*National Gem of Physicians*” Award, this award is given annually for excellence in the fields of Ayurveda and Yoga by the Nation’s Health and Education Development Association. This year the award ceremony was organized during a seminar by the Nation’s Economic Development & Growth Society.

#### Invited Talks at Prestigious Events

- Amrita Presents at American Physical Society Meeting: Dr. Shantikumar Nair, Professor and Director, Amrita Centre for Nanosciences and Dean of Research, Amrita Vishwa Vidyapeetham delivered an oral presentation at the largest international physics gathering in the world. Organized by the American Physical Society (APS), the congress was convened in Denver, Colorado during April 13 -16, 2013. Dr. Shanti’s paper was titled Relativity of Scale: Emergence of Quantum Behavior from Space-Time Geometry and Its Implications. This Amrita talk was the only presentation from India. It was scheduled in the session titled, Classical and Quantum Gravity.
- Amrita’s Dr. M. Aravindakshan, Head, Centre for Environmental Studies at Amrita’s Coimbatore campus delivered an invited lecture at the International Conference on Society, Technology and Sustainable Development (in June 2011), on sustainable waste management, elaborating on his experience with liquid waste management at the campus. The Amrita Coimbatore campus has rainfall only at the level of a desert, but in this desert, we have been able to create an oasis. During the past twelve years, we have planted hundreds of thousands of trees. We received a certificate of appreciation from the United Nations Environmental Programme for participating in the one-million tree planting programme.
- Dr. Pooja Sharma of the Department of Mangement, Bengaluru, was invited to deliver a lecture at the State University of New York, Buffalo, in May 2011. The lecture was titled, “*Reaching the Rural Indian Market through Creative Advertising*”. Dr. Pooja’s lecture was part of the Asia at Noon series, sponsored by the Asian Studies programme on the Buffalo campus that regularly hosts visiting faculty from Asian nations.

- Amrita's Dr. R. Jayakumar was in Malaysia in December 2009 for an invited talk titled Novel Natural Biopolymeric Nanomaterials in Medicine. As Associate Professor at the Amrita Centre for Nanosciences and Molecular Medicine, Dr. Jayakumar conducts research on the development of biodegradable polymeric nanomaterials, nanofibers, gels, scaffolds and membranes for tissue engineering and drug delivery and wound dressing applications. Accordingly, he was invited to speak at the International Conference on Nanotechnology — Research and Commercialization, in Malaysia during December 14-17, 2009. Emerging Nanotechnology Enabling Scientific Discoveries and Innovations for Wealth Creation was the theme of this conference organized by the Advanced Materials Research Centre (AMREC) and SIRIM BERHAD.
- At the Amrita School of Biotechnology, researchers are studying the phenomenon of wound healing and among other things, modeling it mathematically. Dr. Bipin Nair, Dean of the School, was invited to deliver a talk on this subject at the University of Milan in Italy. The talk was organized by the Department of Mathematics at the Università degli Studi di Milano (University of Milan), on Nov 17, 2008. It was open not only to mathematics faculty and students but also those from other multi-disciplinary areas at the university. The talk focused on the interaction of mediators like growth factors, nitric oxide, matrix metalloproteinases and their individual roles in wound healing.
- Prof. Satish K. Manocha of Amrita School of Engineering at Bangalore, delivered the Inaugural Address at the launch of the 5th Annual Convention of ITU-APT Foundation of India (IAFI) - a sector member of the International Telecom Union (ITU) - organized in April 2009 at New Delhi, where the theme was, "Providing Connectivity to the Unconnected". Prof. Manocha was part of the Department of Electronics and Communication Engineering at Amrita. His research focuses on Telecommunications, Mobile Communications and Digital Communications.

### Scientific Breakthroughs

- Nanotech Breakthrough by Amrita Alumnus: Amrita alumnus Dr. Vijay Prasad Sivan along with other researchers at Royal Melbourne Institute of Technology (RMIT) recently made a breakthrough that is expected to significantly advance research in soft electronics and industrial sensing technologies. Together, the team working at RMIT's Platform Technologies Research Institute developed droplets of liquid metal coated with nanoparticles. Dr. Vijay graduated from the Amrita's Coimbatore campus in 2001 with a BE degree in Electrical & Electronics Engineering. Dr. Vijay has published the results of his research in several international journals. He has also presented the same at international conferences around the world. The results of the nanotech breakthrough were first reported in the January 2013 issue of the peer-reviewed scientific journal, Advanced Functional Materials.
- Dr. Sheela Nampoothiri, known worldwide for her outstanding work in the field of rare genetic and metabolic disorders recently received yet another accolade for her research. She described a new syndrome which was

hitherto undiagnosed. The details were published in the American Journal of Medical Genetics as a paper titled, “Macrostomia, Thin Upper Vermilion Border, Long Philtrum, Broad Halluces and Intellectual Disability in Two Sibs”. This genetic defect was first described by her and it now carries her name.

### Appointment to High-Profile Committees

- Amrita Ayurveda Medical Director in CCIM-UGC: The Central Council for Indian Medicine (CCIM) is a professional council under the University Grants Commission (UGC) that monitors higher education in the Indian systems of medicine such as Ayurveda, Siddha and Unani in India. The council unanimously selected Br. Dr. Sankara Chaitanya, Medical Director, Amrita School of Ayurveda as its honored board member in May 2013.
- IEEE Nominations and citations: Two faculty member of Amrita Vishwa Vidyapeetham have received prestigious national appointments to the Institute of Electrical and Electronic Engineers (IEEE). The IEEE nominated Amrita’s Professor Raghu Raman to be the Chair of the India wide IEEE Education Society in 2012 and Prof. Prashant R. Nair, Vice Chair, in 2013. Both of them received IEEE citations when IEEE Education Society India council won global chapter achievement award of IEEE. At Amrita, Prof. Raghu leads the Centre for Research in Advanced Technologies for Education (CREATE). Inspired by Chancellor Amma’s vision of education for all, by integrating research and practice, CREATE at Amrita works to develop accessible and affordable educational technologies.
- Dr. T.S.B. Sudarshan, Professor & Chairman, Department of Computer Science & Engineering, Amrita School of Engineering, Bangalore has been appointed as Chairman of the Internet Society (ISOC), Bangalore Board in June, 2013.
- Dr. Dhanesh G. Kurup and Mr. Alok Kumar Jha, faculty members at Amrita School of Engineering, Bangalore have been nominated as Executive Members of IEEE Bengaluru Chapter including India Council and Nanotechnology Sections in February, 2013.
- Research articles of the faculty members from department of mathematics at Amrita School of Engineering, Bangalore, Dr. K.V. Nagaraja and Dr. B. Venkatesh in reputed journals have crossed 50 citations.
- Faculty are in international and national leadership positions for various national task forces, national missions and professional bodies like Dr. Shantikumar Nair, Director, Amrita Centre for Nanosciences & Molecular Medicine is on Nano Task Forces of DST, DBT and ICMR and Food Authority of India, Dr. V. V. Pillay was appointed as a member of the Peer Review Committee of the International Programme on Chemical Safety (IPCS) of the World Health Organization, Prof. Raghu Raman and Prof. Kamal Bijlani are in the Standing committee, National Mission on Education using ICT of Government of India, Prof. Bhavani Bijlani is in the steering committee to revamp vocational education in India, Prof. Prashant R. Nair, Vice-Chairman - IT is on national committees of IEEE and Computer Society of India and Dr Sherry Peter, Dept of Head & Neck

Surgery elected as Secretary of Indian Society for Facial Plastic and Reconstructive Surgery.

- In April 2012, Dr. Balagopal Varma, Vice-Principal of dental school was awarded membership to the Royal Australasian College of Dental Surgeons (MRACDS) in the special field stream of Paediatric Dentistry.
- Dr. Vinayan K. P., Clinical Professor in the Department of Neurology at the Amrita School of Medicine, was appointed as a member of an international task force for epilepsy in April 2010. As a part of the International League against Epilepsy, the task force will strive towards advancing and disseminating knowledge about epilepsy, especially in children, and promoting research, education and training for its management.
- Belarus, a small country in Europe, part of the erstwhile Soviet Union, was the venue for the 1st Euro-Asian Head and Neck Cancer Congress in July 2009. Dr. Subramania Iyer, MS, MCh, FRCS from the Amrita School of Medicine was invited as Scientific Co-chairman of the congress. Dr. Iyer is HoD, Department of Reconstructive Surgery, at Amrita. In November 2008, he was felicitated at the National Conference in Varanasi of the Association of Plastic Surgeons of India for his path-breaking work in reconstruction of orbit maxillary tissue using TFL osteomyocutaneous flap. Under his leadership, the department has won growing recognition nationally and internationally. At Varanasi, the department received the most coveted Peet Prize, for the third consecutive year. Dr. Iyer is a Craniofacial Fellow in Mexico and a UICC Fellow at the Centre Oscar Lambrette in Lille, France. He has been trained in Plastic Surgery and Head and Neck Surgery in UK.

#### **Paper Presentations at Prestigious Scholarly Events**

- Faculty from Department of Mass Communication, Chairperson and Assistant Professor Ms. Sudha Venkataswamy and Assistant Professor Sreedevi Purayannur presented papers at an international conference during June 24-27, 2012 organized by the Asian Media Information and Communication Centre in Hyderabad, exploring the conference theme, “Taking Stock of Media and Communication Studies: The Challenges and Opportunities of Globalization”, New Media and Rise of Asia. After the paper presentations, the two faculty members participated in a post-conference workshop on UNESCO Model Curricula in Journalism Education.
- At BADR CARDIOCON (June 2011), the interventional cardiology CME recently organized in Muscat, Oman, senior faculty from the Amrita Department of Cardiology played a key role. Senior Amrita doctors provided an overview of CME topics that included all aspects of interventional cardiology. Dr. K. K. Haridas presented an overview of adult cardiac interventions while Dr. Balu Vaidyanathan spoke on the scope of pediatric cardiac interventions. Current developments in cardiac electrophysiology were summarized by Dr. K. U. Natarajan and a lecture on trans-radial interventions was delivered by Dr. T. Rajesh.
- Over a thousand nurses from all over the world gathered recently at the 38th Annual Convention of the Infusion Nurses Society (INS) in

Louisville, KY. Amrita was represented by its Chief Nursing Officer, Bri. Saibala. As one among the hundred foreign delegates from nearly twenty nations, she had received a travel scholarship of \$ 5000 to attend this conference. The scholarship is given to only two international delegates every year; Bri. Saibala was the first person ever to be nominated from India to receive this scholarship.

- Assistant Professor Rajesh Kannan Megalingam led a research initiative with his B.Tech. (ECE) students, viz., Mithun Muralidharan Nair, Rahul Srikumar, Venkat Krishnan Balasubramanian and Vineeth Sarma, that involved developed of a novel method for digital image watermarking and digital image compression that has several advantages over methods currently in use. The work of this Amrita team, already presented and published as research papers\*, was made available as part of a MATLAB book, ISBN # 979-953-307-124-3, published by InTech Open Access Publishers, University Campus, STeP Ri, Croatia.
- A paper titled Organized Retail: The Hub for Evolving Ecosystems? was presented at an international conference on Global Impact of Indian Management organised at Oxford College of Engineering, Bengaluru (April 2011). The paper was presented by Assistant Professor of Business, Dr. S. Usha Nandhini from the Department of Mangement, Bengaluru, who led the study.
- On April 29 and 30, 2011, Prof. Raghu Raman (Head – Amrita CREATE Lab) attended a conference sponsored by IAJC (International Association of Journals and Conferences) and ASEE (American Society for Engineering Education), at Hartford, U.S.A., where he presented two papers illustrating the merits of Virtual Learning (VL): (1) Virtual Labs Collaborative and Accessibility Platform (VLCAP) and (2) Computer Assessment of Practical Skills (CAPS) Using Scaffolding Methodology as Enabler of Learning.
- An Amrita research paper titled, “*Real-Time Monitoring and Detection of Heart Attack using Wireless Sensor Networks*”, was awarded the best paper at SENSORCOMM 2010, the 4th International Conference on Sensor Technologies and Applications. Authored by Kala John K., third semester M. Tech. student of Amrita’s Wireless Networks and Applications programme and Dr. Maneesha V. Ramesh, Head of the Department, the research paper was selection for publication in IEEE Xplore. Dr. Maneesha traveled to Venice in Italy during July 18 – 25, 2010 to present the paper at the conference.
- Amrita’s paper Real-Time Wireless Sensor Network for Landslide Detection was awarded a top paper award in the conference SENSORCOMM 2009 held in Athens, Greece. This Third International Conference on Sensor Technologies and Applications was co-sponsored by IARIA (International Academy, Research and Industry Association), specifically its “Workgroup on Sensors” and the IEEE Computer Society, Greece Chapter. The author, Dr. Maneesha Ramesh, was in Athens in June 2009 to present the paper.
- A paper titled, “*Effectiveness of Adaptive Learning with Interactive Animations and Simulations*”, was presented at the 2nd International Conference on Computer Engineering and Applications (ICCEA 2010) in

Bali Island, Indonesia, in March 2010, by Mrs. Prema N. of Amrita's CREATE Labs, Amritapuri.

- Dr. Sheela Nampoothiri, HoD, Department of Pediatric Genetics at the School of Medicine, was invited to present a paper titled, "*Lysosomal Disorders in Kerala – Experiences from AIMS,*" at the Asia Pacific Lysosomal Storage Disorder Conference held at New Zealand, 20th-23rd November 2008. The paper won wide appreciation on account of its reporting on the largest series of lysosomal storage disorders from India.
- Dr. Shyam Diwakar from Amrita School of Biotechnology traveled to Singapore in June 2010, to speak at Neuro Talk 2010, a world congress of neuroscientists. Dr. Shyam's talk was part of the Neuromathematics, Neurophysics, Neuroinformatics and Computation Neurobiology track at the conference. Dr. Shyam was one of only eight speakers from India.

### Memoranda of Understanding & Linkages

Over the years Amrita Vishwa Vidyapeetham has developed working relationships with many of the best universities in the world. Amrita Center for International Programs plays a developmental, strategic and co-coordinating role in the university's international work, seeking to provide quality support both internally and externally. Strong collaboration with national and international organizations is the hallmark of all research carried out at Amrita University and to this extent the center has developed a broad range of international partnerships around the world. The university is putting in place a range of institutional links which support key international activities such student exchanges, dual degrees, remote teaching, joint academic programmes, co-guiding PhD students, high-end research collaboration and other collaborative initiatives. In 2012, the university was chosen as the Co-Coordinator of the prestigious European Union Project i.e. Erasmus Mundus II (3 Million Euro Project) along with Politecnico Di Torino, Italy.

A partial list of the MoUs signed is given below:

- international MoUs signed
  - University of California, Davis, USA
  - University of New Mexico - Dual Degree program
  - Telecom Sudparis, France
  - University of Catalonia, Spain
  - Deakin University, Australia
  - University of California ,Davis (India Research Internship Program Working Agreement )
  - University of California, Davis (Global Study Program Working Agreement )
  - University of New Mexico, Dept. of Electrical and Computer Engineering
  - University of Marymount
  - University of Massachusetts
  - Munich University of Technology, Germany
  - Uppsala University – Collaborative Initiative on Higher Education and Research

- Willpower (Master's & Ph.D. Programs) – University Libres des Bruxelles, Belgium; Ecole Centrale Nantes, France; Ecole Centrale Paris, France; Supelec, France; Technical University of Munich, Germany; Politecnico de Milano, Italy; Università Degli Study di Padova, Italy; Politechnika Warszawska, Poland; Universidad de Sevilla, Spain; Universitat Politecnica de Catalunya, Spain;
- India4EU - Politecnico di Torino, Italy; Alma Mater Studiorum - Università di Bologna, Italy; Grenoble Institute of Technology, France; Royal Institute of Technology of Stockholm (KTH), Sweden; Politecnico di Milano, Italy; Aachen University (RWTH), Germany; Helsinki University of Technology (TKK), Finland; University of Trento, Italy; Universidad Politécnica de Madrid (UPM), Spain;
- Vrije University, Netherlands - Parallel and Distributed Systems (Dual Degree Masters Program)
- Roma Tre University, Faculty Of Engineering - Cultural And Scientific Cooperation Executive Protocol Between The Faculty of Engineering Of Roma Tre University and Amrita Vishwa Vidyapeetham

A sample of the industrial linkages is given below.

<b>MoUs signed by Center for Corporate and Industrial Relations (CIR)</b>					
#	Company	Subject	PERIOD OF MoU		
			From	Till	Tenure
1	Infosys Technologies Limited	Campus Connect	11.01.2005	10.01.2008	3 years
2	Tata Consultancy Services	TCS Sangam etc.	31.07.2006	31.03.2009	3 years
3	Tata Consultancy Services	TCS German Language Chair	24.08.2006	23.08.2009	3 years
4	National Aerospace Laboratories	Cooperative programme in Academic training & research	08.12.2007	07.12.2010	3 years
5	Robert Bosch Engineering & Business Solutions	Strategic linkage bet. ASE & RBEI, Research topics etc.	15.09.2011	14.09.2014	3 years
6	Wipro Limited	Understanding between Wipro & ASE	April, 2005	April, 2007	2 years
7	Kriatec Services (P) Ltd	To improve skills of Engg. students etc.	10.03.2010	Till completion of 2 batches	2 years

8	Microsoft Corporation (I) Pvt. Ltd.	Microsoft Embedded System - Student Scholarships	29.06.2005	28.06.2011	6 years
9	IMS Learning Resources Pvt. Ltd.		21.08.2006	20.06.2007	1 year
10	Cognizant Technology Solutions India Pvt. Ltd.	Setting up of Cognizant - ASE Innovation Lab	31.10.2011	30.10.2016	5 years
11	Triumphant Institute of Management Education (TIME)	Training programme	27.08.2008	Till Trg. Prog. Is over	
12	Automotive Test Systems (ATS), Pune	Establishment of Automotive Technology Centre etc.	01.03.2012	28.02.2015	36 months
13	ATMEL (MCU Centre Application Form)	Establishment of ATMEL Micro-Controller Unit at AVVP	03.03.2012	NA	
14	Aspiring Minds Assessment Pvt. Ltd.	Proposal for imparting pre-employment skill assessment program for 2013 batch students of AVVP	04.04.2012	Till completion of training to 2013 batch	
15	Aspiring Minds Assessment Pvt. Ltd.	Proposal for conduct of AMCAT test for ASAS students of all campuses	27.02.2013	Till completion of training & test	
16	Mango Technologies Pvt. Ltd., Bangalore	Joint innovation in the field of mobile application and allied solutions	02.09.2010	01.09.2013	3 years
17	Cranes Software International Ltd. (Univ. Prog. Partner of Texas Instruments India)	To establish a teaching/ research lab in the area of Analog System Design	23.08.2011	not mentioned	not mentioned

18	Freescale Semiconductor	Help Amrita develop solutions using Freescale Technologies for student training & to provide facilities for the development of products and solutions using technologies	10.9.2012	9.9.2017	5 years
19	CISCO	Corporate Research Gift Agreement	24.04.2012		2 years
20	HCL Technologies Ltd.	Collaboration for mutual benefit, in areas expalined in Annexure to the Agreement	30.09.2012	29.09.2015	3 years
21	Info Edge India Ltd. (SHIKSHA.COM)	Agreement with Shiksha.com for online solutions for ASB	08.12.2011	15.06.2012	9 months
22	Info Edge India Ltd. (NAUKRI.COM)	Agreement with Naukri.com for online solutions for ASE	01.10.2012	30.09.2012	1 year
23	Larsen & Toubro (L&T)	Confidentiality Agreement with L& T Valves	28.09.2012	27.09.2017	5 years
24	Mingle Box	MoU for Online Advertisement of ASB			
25	Inzane Labs pvt. Ltd. (PagulGuy)	MoU for Online Advertisement of ASB	18.09.12		
26	TCY Online.com	MoU for Online Advertisement of ASB			
27	ROOTS Industries India Ltd.	Confidentiality Agreement	01.11.2012	31.10.2014	2 years

28	Tata Consultancy Services	TCS Research Scholar Sponsorship programme	12.10.2012	11.10.2020	8 years
29	Crane Software Intl. (Texas Instruments)	a) Setting up of Embedded Center on Beagleboard at Amrita	09.11.2012		
		b) Setting up of Analog Teaching Lab at Amrita	09.11.2012		
		c) Setting up of Teaching / Research Lab at Amrita	09.11.2012		
		d) Setting up of Teaching / Research Lab at EEE Dept	29.01.2013		
		e) Setting up of Analog Teaching Lab at EEE Dept	29.01.2013		

To illustrate the impact and benefits of the MoU, a few samples are given below.

- On December 7, 2010, Dr. P. Venkat Rangan, Vice Chancellor of Amrita University and Prof. Paolo Collini, Director, School of International Studies, University of Trento, signed a Memorandum of Understanding (MoU) between the Amrita School of Business and the University of Trento, Italy. The memorandum marked the beginning of a two-year collaborative partnership designed to foster academic excellence. The cooperative venture included programmes for student exchange, internships and possibly a dual degree offering.
- Texas Instruments offered to help set up an analog system design lab at the qualifying engineering colleges; Amrita University signed a MoU to establish a teaching/research lab facility on campus. The lab will provide students the ability to perform analog system design experiments as part of the basic circuit design lab. Using the ASLKv2010 Starter Kit as well as other analog kits, students will be able to easily build advanced applications.
- The India-Sweden Joint Working Group on Science and Technology promotes collaborative research. Now it will support a project at Amrita School of Engineering (Coimbatore) to be undertaken in partnership with the KTH, Sweden. This project on Energy Management on Smart Grid using Embedded Systems started on January 1, 2011. Funding will be provided for a period of three years. Dr. Sasi (Prof. Dept. of Electrical & Electronics Engineering), will be joined by his colleagues Dr. T. B. Isha, Dr. T. N. P. Nambiar, Prof. A. T. Devarajan and Prof. P. Supriya, in carrying out the project.

- A delegation from Amrita Vishwa Vidyapeetham traveled to the École Polytechnique Fédérale de Lausanne (EPFL) in Switzerland. The Amrita team including Dr. Krishnashree Achuthan, Dr. Maneesha Ramesh and Dr. Shyam Diwakar met with faculty in several areas, in Oct 2010.

### Faculty Visits / Exchange Programs - International Institutions

A sample of the faculty visits, faculty exchange, and student exchange activities is given below.

- Ms. Smrithi Rekha, faculty, Department of Computer Science and Engineering at the Coimbatore campus, was nominated from Amrita Vishwa Vidyapeetham to participate in the, “MIUR Young Indian Researcher Mobility to Italy”, programme. In Italy, Ms. Smrithi carried out research on, “Software Architecture Based Testing”, at the University of L’Aquila, Italy. She stayed there for a period of one year.
- Ms. Sabitha M., Vice Principal and Assistant Professor at the Amrita School of Pharmacy spent one month in the United States at the Hospitals and Health Centres, and College of Pharmacy attached to the University of Michigan (July 2010). Considered as one of the best colleges in the world for medical and pharmaceutical training, the University of Michigan invited Ms. Sabitha to undergo advanced training in the practice of clinical pharmacy. She was one of only two scholars invited from India.
- As part of the India 4 EU programme Dr. Zeena S. Pillai, Chairperson, Department of Chemistry, Amritapuri Campus, had the opportunity to work at the University of Bologna in Italy for two months in June-July 2010. Considered as one of the world’s top research groups in the field of Supramolecular Chemistry, the group includes, among other eminent scientists, Profs. Vincenzo Balzani, Paola Ceroni and Margherita Venturi.
- Dr. Biresh Sahoo is a Professor of Economics at the Amrita School of Business. He has taught classes in core subjects such as Microeconomics and Macroeconomics to MBA students as well as offered elective courses in subjects such as Econometrics. In 2008, he was awarded a prestigious 9-month postdoctoral fellowship by the Department of Economics at Vienna University. Wirtschaftsuniversität Wien (WU-Wien), known also as the Vienna University of Economics and Business Administration is the largest university in Europe for business administration and economics. His research project was titled “*Extended DEA Models for Scale Economies and Eco-efficiency*”.
- Dr. K. Somasundaram, Associate Professor of Mathematics at the School of Engineering in Coimbatore, went on a post-doctoral research fellowship at the Department of Computer Science in the University of Turku, Finland, in April 2009. Dr. Somasundaram and his collaborator, Prof. Juha Plosia, focused on developing a routing architecture and routing algorithm that minimizes congestion over the network. The research project spanned a period of minimum 9 months. The fellowship opportunity was made available to Dr. Somasundaram through the Eureka project under EC’s EMECW programme.
- Dr. Manzoor K., Professor at the Amrita Centre for Nanosciences, spent a year in Europe on the prestigious Marie Curie fellowship that funds top scientists from around the world to work on short- and long-term projects

in various European institutions to develop new technologies in advanced scientific areas.

- 30 students, as part of the India 4EU program, under the broader umbrella of Erasmus Mundus, the extensive faculty-student exchange program funded by the European Commission, went to Europe. The students from B.Tech, M.Tech. and M.B.A. programs in Amrita Vishwa Vidyapeetham. They complete part of their coursework in European Universities in Finland, France, Germany, Italy and Sweden. The students spent up to ten months at the host university, taking classes in their respective areas.
- Students from Amrita Center for Nanosciences participated in an Indo-US exchange program for research – with University of California, Stanford, and Rice University (USA).

### **Best Paper, Best Poster & Best Thesis Awards**

- Ms. Anita Rajah, Clinical Assistant Professor in the Department of Clinical Psychology, presented a poster titled, “Cognitive and Behavioural Profile of Children with Average Scholastic Performance”. The poster won first prize in the 37th National Annual Conference of the Indian Association of Clinical Psychologists in Gujarat (May 2011).
- Dr. Bindu S. and Dr. Prashant M. Kedari of the Department of Pediatric Surgery at Amrita School of Medicine made their alma mater proud by winning the first prize in an All India Quiz Competition in Pediatric Surgery. The competition was conducted as part of the Pediatric Surgery Update 2011 at Maulana Azad Medical College, New Delhi.
- Dr. Amalendu Jyotishi, Professor at the Department of Management, Bengaluru campus, received the V. K. R. V. Rao Memorial Prize for best doctoral dissertation, studying shifting agriculture in Orissa, in March 2011.
- At the fourth annual conference of the Gujarat Society of Head and Neck Oncology (G-SHNO), March 2011, Dr. Mayuri M. Rajapurkar of the Department of Head and Neck Surgery and Oncology at the Amrita School of Medicine won several honors. She won the awards for the best paper and the best poster; the former was conferred for her paper titled Orbital Floor Reconstruction in Maxillectomy and the latter for a poster titled The Preserved Eye in Malignant Sinonasal Tumors.
- ASB Dean and Professor Dr. Gurumurthy Kalyanaram and ASB Professor Dr. Deepak Gupta, authored a paper titled, “The Effect of Direct Advertising to Consumers (DTCA) on Market Share and Quantity in Pharmaceutical Drugs and Consumer Welfare”. The two professors collaborated with faculty from Kazakhstan Institute of Management, Economics and Strategic Research, Alma Alpeissova and Dilbar Gimranova to present the paper at the 47th Annual MBAA International Conference in Chicago during March 23rd-25<sup>th</sup>, 2011. The paper received the 2011 **Best Paper Award** in Pharmacoeconomics, Pharmaceutical Industry and Wellness Track.
- Amrita’s HoD of Retinal Services (Amrita School of Medicine), Dr. Gopal S. Pillai, won the first prize for his paper presentation in the posterior segment free paper session at Drishti 2009, the 34th Annual Conference of the Kerala Society of Ophthalmic Surgeons, conducted in Kannur on

- November 29, 2009. The paper was titled, “*Results of Small Gauge Vitrectomy for Retinal Diseases: A Retrospective Analysis of 586 Cases*”.
- Dr. Alice Kurien of the Amrita School of Dentistry was felicitated at the Indian Dental Association’s Kerala Conference at Calicut in Dec 2009. The Bulletin of the Indian Dental Association received the Best Dental Journal Award at the Conference. Dr. Alice, the Bulletin’s editor, received this award from the Honorable Health Minister, Smt. Sreemathi Teacher.
  - Faculty members from Amrita School of Medicine’s ENT Department were recently honored at the 8th Annual Conference of the Association of Otolaryngologists of India, Kerala State Branch.
    - Dr. Vineeth Viswam’s paper, “*Stones, Bones, Moans ... and Beyond*”, was adjudged the best among eight consultant papers.
    - Out of 30 PG papers, the Gold Medal for best paper was won by Dr. Deepthi for her paper — FESS – Are our patients satisfied?
    - Dr. Deepthi was recognized a second time, winning the Best Poster award for her poster on Kashima’s, “*The Balancing Act*”.
  - At the State Orthopaedics Conference at Palakkad held in Jan 2010, Dr. Ranjith Unnikrishnan of Amrita was awarded the Prof. T. K. Surendran memorial gold medal for his paper titled Anterior Vs Posterior Surgery in Thoracolumbar and Lumbar Adolescent Idiopathic Scoliosis: A Prospective Randomized Study. At the same conference, Amrita’s Dr. Jiss Joseph Panakkal, Sr. Resident in Orthopaedics was a member of the winning team that won the first prize in the Kerala Ortho quiz.
  - Amrita’s Dr. Ajit Kumar Varma was awarded the oration medal, a certificate and a plaque at the Dr. S. C. Mishra Memorial Oration Contest, conducted in Jan 2010 by CSM Medical University, previously King George Medical College, Lucknow. The contest was part of the 55th Foundation Day celebrations of the University. Dr. Varma was invited by the Head of Department of Surgery to take part in the contest. His 30-minute talk was titled, “*Diabetic Foot — An Overview*”.
  - Dr. Anupama, Assistant Professor in the Obstetrics and Gynecology Department at the Amrita School of Medicine, won the best paper prize in oncology at the Obstetrics and Gynecology Conference in Guwahati, in Jan 2010.
  - Amrita School of Medicine’s Dr. Sebind Kumar, was awarded the 2nd place for his poster at the 3rd South Asian Regional Symposium on Evidence Informed Healthcare recently conducted at the Christian Medical College, Vellore, in Jan 2010. Dr. Sebind, MBBS, DPM, DNB, is Clinical Assistant Professor of Psychiatry at the Amrita School of Medicine. Titled, “*Modafinil for clozapine induced adverse effects in people with schizophrenia and schizoaffective disorders in remission: a randomized, placebo-controlled trial*”, Dr. Sebind’s poster was selected from 53 other posters on various medical topics, from India and abroad.
  - In May 2010, at the Delhi Ophthalmic Society Conference, Dr. Sujithra H. of the Department of Ophthalmology was awarded the best video presentation award for her video, Amritakiranam. Amritakiranam depicts a tele-ophthalmic approach to management of diabetic retinopathy in remote areas.
  - Dr. Shikha Tripathi presented a paper titled, “*Unified 3GPP and 3GPP2 Turbo Encoder FPGA Implementation Using Run-time Partial*

*Reconfiguration*”, at the 9th Wireless Telecommunications Symposium organized in Tampa, Florida, USA during April 21-23, 2010. Dr. Shikha undertook this research work with undergraduate students, Rishi Mathur and Jyoti Arya. At the conference, the paper won the best paper award in the category of contribution by undergraduate students.

- Dr. Binu Sasidharan, Fellow at the Department of Orthopedics won the Prof. P. A. Alexander Memorial Gold Medal at ARTHROCON 2010, an International Knee Symposium convened in Calicut in Jun 2010. The gold medal was awarded for his paper titled, “Analysis of Valgus Angle following Navigation for Total Knee Arthroplasty (TKA)”, which was adjudged as the best paper in the conference.
- Dr. Tufela Shafi, Vitreo-Retinal Fellow at the Department of Ophthalmology won the best paper award in the 61st Delhi Ophthalmic Society Conference at New Delhi, in May 2010. Her paper was titled, “*Core Vitrectomy versus Near Total Vitrectomy with PVD induction and retinal surface cleaning in the visual outcome of postoperative endophthalmitis*”.
- “*Fast Dual-Radio Cross-Layer Handoffs in Multi-Hop Infrastructure-Mode 802.11 Wireless Networks for In-Vehicle Multimedia Infotainment*”, this research paper was presented by Mr. Sudharsan of ARL (Amrita Research Labs) at the 2nd IEEE International Symposium on Advanced Networks and Telecommunications Systems (ANTS) held during December 15-17, 2008 at IIT Mumbai. Co-authored by Mr. Jayaraj, Mr. Sriram, and Mr. Ranjith, all from ARL, this paper received an honorable mention in the conference. It was deemed the best paper in the Non-Telecom category. The four authors were invited to attend the conference next year free of cost. They are part of the team that developed and deployed an In-Vehicle Multimedia Infotainment System at Amrita University.
- At three major national conferences conducted in the past few months, our doctors won the top honors for their paper and poster presentations.
  - Foundation for Head and Neck Oncology 8th National Conference in Bhubaneswar, Dec 2008, Dr. Surij Salih, Head and Neck Institute, School of Medicine won gold medal for best paper presentation: Paper Title — Tensor fascia lata osseomusculocutaneous free flap for orbito-maxillary defects.
  - Dr. Naveen, Head and Neck Institute, School of Medicine won gold medal for best poster presentation: Poster Topic — Lateral arm free flap for oral tongue defect reconstruction, 3rd World Ayurveda Congress, December 2008, Jaipur, Rajasthan, India.
  - Dr. B. Rajeev, Honorary Consultant, Holistic Medicine won second prize for paper presentation and best poster presentation award Topic — Scope of Ayurveda in Geriatric Healthcare ECON 2008 — 9th Joint Annual Conference of the Indian Epilepsy Association and Indian Epilepsy Society Oct 2008, New Delhi, India.
  - Dr. Vinayan K.P., Clinical Professor, Department of Neurology won 2nd best poster award for his clinical series presentation of a rare epileptic syndrome, a first for India, for the topic — A study of

- the clinical and electrographic characteristics of Angelman syndrome.
- Listed below are some honors won by doctors from Amrita School of Medicine during the first two months of 2009.
    - 63rd IAPM Kerala Chapter Meeting at AIMS, Kochi on Feb 14, 2009  
Dr. Sunil P.V., DNB Trainee from the Dept of Pathology won the Best Case Presentation Award in the neuropathology slide seminar session for his presentation of the case titled — Giant Cell Ependymoma of the Filum Terminale.
    - Neurological Society of India, Kerala Chapter Meeting at Trichur, February 14-15, 2009: Neurogenic Dysphagia in Acute Ischemic Stroke – Incidence, Severity and Outcome: A Clinical Study. This paper by Dr. Pravin Thomas won the Best Paper Presentation Award in Neurology. The paper was co-authored by Dr. Anand Kumar, Dr. Suresh Kumar, Dr. Sreekala, Dr. Siby, Dr. Vinayan, Dr. Bindu and Dr. Arun Grace.
    - Indian Society of Gastroenterology, Annual Conference of Kerala Chapter at Kovalam, Feb 2009: Dr. Gaurav Pandey of Department of Gastro Medicine, won the second place in the free paper session for his presentation — Experience with Living Donor Live Transplantation. Dr. Supriya Sharma of Dept of Gastrointestinal Surgery also won the second place for her poster — Rodenticide Induced Fulminant Hepatic Failure: An Unappreciated Problem.
    - State Orthopaedics Conference (KOACON), Perinthalmanna on Feb 1, 2009; Dr. Kiran R. and Dr. Dnyanesh Girish Lad of the Orthopaedics Department won third prize in the Quiz Competition.
    - Annual Conference of Association of Surgical Gastroenterologists, Kerala Chapter at Calicut, Jan 25, 2009: Dr. Murali Jayaraman from the Department of GI Surgery won the Best Poster Award for his poster titled — Bariatric Surgery – Definitely a Metabolic Surgery.
    - National Conference USICON 2009 at Indore, Jan 22-25, 2009: Dr. Kamlesh Maurya from Department of Urology won first prize for Uro Quiz Competition. (Dr. Vinod of the same department was the winner last year; Amrita has won the first prize in the quiz competition two years in a row.)  
Acute Page Kidney – Unusual Presentation of Renal Allograft Biopsy — This poster by Dr. Ginil Kumar, Dr. Kamlesh Maurya, Dr. Georgie Mathew, Dr. Sanjay Bhat and Dr. Appu Thomas won the second prize for poster presentation.
  - Three faculty members from the Department of Mechanical Engineering at Bangalore (Vinod Kotebavi, Ravi Kumar V., Phanibhushana M.V.) participated in the National Conference on Trends and Developments in Renewable Energy Sources organized at Hosur in Karnataka, in Feb 2009. Their research paper titled, “*Comparison of Performance and Emissions from Diesel Fuel and its Blends in C.I. Engines*”, won the best paper award.
  - At the Second Annual Conference of the Society of Periodontologists and Implantologists of Kerala, Dr. Angel Jacob from the Amrita School of

Dentistry's Department of Periodontics, received the Best Paper Award for her work on patient compliance with periodontal therapy. Entitled, "*Compliance with recall visits by patients with periodontal disease: Is the practitioner responsible?*", the scientific presentation was made at the Travancore Heritage Centre in Trivandrum, May 02-03, 2009.

### Other Awards

- State Orthopaedics Conference (KOACON), Perinthalmanna on Feb 1, 2009; Dr. Kiran R. and Dr. Dnyanesh Girish Lad of the Orthopaedics Department, Amrita School of Medicine, won third prize in the Quiz Competition.
- In Dec 2008, the first batch of second year DNB (Diplomate of National Board) students of Pathology — Dr. Bindhu M. R. & Dr. Mohana S. N. — cleared the DNB exam. In January 2009, Dr. Sashidhar, DNB student in the Department of Anesthesia, was awarded a gold medal for his performance in the DNB Anesthesia Exam. Another gold medal was bagged by Dr. Bharat N.S., of ENT Dept. The National Board of Examinations had selected him based on his performance in the academic session ending June 2008. He was specifically nominated for the otorhinolaryngology specialty within ENT. Amrita's DNB students excelled at other forums too. At a nation-wide scholarship exam conducted by Torrent Pharmaceuticals, second year Endocrinology DNB students claimed the two top prizes. Dr. R. Bharat stood first and received a scholarship amount of Rs. 1 lakh. Dr. Anish Ahmed came in second and received an amount of Rs. 50,000.
- Amrita School of Medicine's Dr. Sandeep Sreedharan, was awarded the second prize for the 2010 Niyamathullah Memorial Essay Competition, conducted by the Indian Society of Nephrology. The competition, open to post-graduate students (MD/DNB) of general medicine and pediatrics, saw participation from hundreds of young doctors from around the nation. Dr. Sandeep received the prize on February 14, 2010 from Dr. A.P.J. Abdul Kalam, at the Society's Annual Conference at JIPMER, Pondicherry.
- Dr. Shikha Goyal from the Department of Radiotherapy, Dr. Yatheesha B. L. from the Department of Pediatrics and Dr. P. Velammal from the Department of General Medicine were all recently honored with gold medals in April 2010.

## STUDENT ACHIEVEMENTS

- In the academic year 2010-2011, a team of students from Amrita School of Engineering, Bangalore developed a “Vertical Take-off and Landing Micro Unmanned Aerial Vehicle (VTOL-MUAV). The students, Akshay Khurana, Kiran G., Pradeep M.M. and Supreeth G. Bharat were fully funded by the university, for this exciting aerial vehicle, which has a wide range of applications including those for civil and military purposes.
- Saurabh Rai (ECE), Anirudh M.M. (EIE) and Sai Kiran G.S. (CSE) of the 2007-2011 batch B.Tech. students from the Bangalore campus stood second in the national competition “Cisco India Net Riders”. They were selected to represent India in Cisco SAARC Net Riders competition, where they finished fifth in the competition among several other teams from India, Bangladesh and Sri Lanka.
- Four students from 2008-2012 batch B.Tech of Amrita School of Engineering, Bangalore, K. Kedar (ECE), Aaditya Sriram, Rohan Prabhu and Nikhil Nandagopal from CSE, participated at the ‘Berkeley Mobile International Collaborative (BMIC 2012)’, a University Mobile Challenge Contest held at Barcelona, Spain in February 2012, wherein they presented their project. Their team was in the 5th position out of the 40 teams that participated all over the world. Aaditya Sriram also represented Amrita University in the “University Mobile Challenge” 2011 held at Mobile World Congress, Barcelona. India was represented by two Universities, Amrita Vishwa Vidyapeetham and IIT Kharagpur.
- Mr. Pranjal Kaustubh and Mr. Nishank Vaish, students of the 2009-2013 batch B.Tech ECE, presented a technical paper on “Self Charging Electric Vehicles” at the International Conference on ‘Industrial and Commercial Use of Energy’ held at Cape Town, South Africa on 15th & 16th of August, 2012. The conference was organized by Cape Peninsula University of Technology and IEEE.
- Mr. Deepak Jose and Mr. Pilanku Savyajit both from M.Tech. (VLSI) have submitted a project proposal titled “EHSAS: Energy Harvesting Smart ASIC System” for Amrita Technology Business Incubator's Amrita-TIDE innovation awards. The proposal is one among the 7 proposals shortlisted from a list of more than 90 submissions. It has been selected as ‘Bright Idea’ and also for ‘Innovation Seed Grant’. Novel Eco-Friendly Vehicle: Amrita team of B.Tech. students from the Amritapuri campus. The team won the first prize for their creation in the inter-collegiate design competition EFFI-CYCLE 2012 organized by the Society of Automobile Engineers, North India Section in Chandigarh during October 12-14, 2012.
- In 2012, Kuruvachan K. George, Junior Research Fellow at Amrita School of Engineering, Coimbatore, received Tata Consultancy Services (TCS) Research Fellowship wherein the best forty applicants from all over India are annually sponsored for doctoral programmes. He has undertaken his doctoral research as part of a project titled Robust Features for Text/Language Independent Speaker Recognition funded by the Defense Research and Development Organization.
- A group of Amrita Vishwa Vidyapeetham engineering students at the Coimbatore campus, combined innovation with ingenuity to tap into a carbon free energy resource. The easy-to-assemble, affordable wind turbine is made from PVC pipes that can be fixed to a rooftop to harness

wind energy. The wind turbine developed is 50cm in diameter and generates enough energy to charge a cell phone, or night lamps. Since wind energy is not continuous, one can connect a battery that gets charged over a period of time. The prototype cost a mere Rs 100, and team comprises Raja Rajan Balasubramanian and Swathi G.K., from Amrita School of Engineering – Coimbatore.

- Amrita's Master of Social Work (MSW) students, presented their research at the International Conference on Society, Technology and Sustainable Development (in June 2011), offering many diverse perspectives. Gahana P., presented her paper titled, Measuring Disaster Resilience: A Study on Urban Flood Management in Kerala, India, which she authored along with Dr. Sunil D. Santha, Chairperson, Amrita Department of Social Work. Another MSW student, Nimmy Rajan, presented a paper titled, "Impact of Disasters on Children: A Case Study", that she co-authored with her faculty guide, Renjith Pillai.
- The Computer Society of India (CSI) student chapter of Amrita School of Engineering, Coimbatore has secured a hat-trick achievement by being adjudged as the best CSI student chapter in India in 2010, 2011 and 2012. This is a significant achievement considering the fact that there are over 600 premier colleges and universities in India with CSI student chapters.
- CodeTeasers to Educate, Inform: Final-year students of Bachelor of Computer Applications (BCA) at ASAS, Kochi hosted a website to teach fundamentals of Java programming (June 2011).
- Kiran Krishnan Kutty and Soumya Swaminath, third-year B.Tech. students from the Department of Electrical & Electronics Engineering in Coimbatore, were selected for the final round of the Go Green in the City contest which will be conducted in Paris during June 23-24, 2011. Theirs was one of the 25 teams short-listed for the international challenge from over 100 teams worldwide. A case challenge for university students to propose clever energy management solutions, Go Green in the City is conducted by the French global company Schneider Electric.
- Dr. Sachin U. Chavre, postgraduate scholar at the Department of Plastic and Reconstructive Surgery at the Amrita School of Medicine won the best paper award at the 24th Annual Conference of the Kerala Plastic Surgery Association (KPSA) conducted in Thrissur (in April 2011). The award was given for his paper titled, "Fibula flap donor site defect closure by propeller flap", in the paper presentation category for postgraduate students.
- B.Tech. (ECE) graduate, S. Bharadwaj, Amrita School of Engineering – Coimbatore, received admission to the highly competitive Integrated Ph.D. programme in TIFR, Mumbai (April 2011).
- Over three hundred students at the Amrita Mysore campus initiated the Amala Bharatam Campaign, organizing the first cleaning drive at Chikkagadiyara Circle, Mysore in April 2011.
- MBA-MS students, Vijay Nagarajan and Kripa Ramesh, at the Bengaluru campus conducted an in-depth analysis of India's macroeconomic policies post Union Budget of 2011. Their efforts won them the first prize at an interactive discussion among B-School students in Bengaluru on the topic. The event titled, "Pratibimb", was organized by Narsee Monjee Institute of Management Studies (NMIMS) on March 11, 2011.

- Students from Amrita Centre for Nanosciences, Nitya, Giridharan, and Praveen, were selected to participate in an Indo-US exchange programme for research – between Amrita and University of California, Stanford, and Rice University (USA) – for summer 2011.
- Nikhil Krishnan, final-year student of B.Tech. (ECE) at Amrita School of Engineering, Amritapuri, secured fourth rank in the nation in the GATE (Graduate Aptitude Test in Engineering) exam for admission to M.Tech. programmes.
- A team of undergraduate engineering students from Amrita School of Engineering, Coimbatore campus, participated in the national-level BAJA SAEINDIA's competition to build an all-terrain vehicle, three years in a row. This year, Amrita's vehicle was selected as one among the top five vehicles that were displayed at the inaugural event. The model also won the second prize for the most cost-effective design; the students' efforts being richly rewarded with a cash prize of Rs. 40,000.
- Anitha Kaveri, second-year MBA student at the Amrita School of Business, Coimbatore recently won the top award in a contest conducted by TCS and The Smart Manager magazine (Dec 2010). The award, that included a prize money of Rs. 25,000, was presented to Anitha for a case analysis titled, "Sweet Salvation". Anitha's analysis recommended strategies that a regional packaged sweets and snacks company could adopt to counter competition and the onslaught of new brands. Anitha's winning analysis was published in the September-October issue of The Smart Manager magazine. This bi-monthly business magazine conducts this case competition regularly, publishing all winning entries in its successive issues.
- Seven second-year students from the Amrita School of Business embarked on a trip to the University of Trento in Italy (Nov 2010). The students stayed in Italy for ten months, attended classes and completed project and field work. Then, upon their return, they graduated with an MBA from Amrita. The students were chosen as part of the prestigious India 4 EU programme.
- Five final-year B.Tech. students of Electronics and Instrumentation Engineering (Amrita Coimbatore campus), developed a novel Human Computer Interface that effectively bridges the gap between man and machine (Oct 2010). Chosen as best project from the department, the Human Computer Interface was conceived as a low-cost yet efficient gesture recognition system. The system detects, identifies and responds to hand gestures via changes in biosignals. Of the many biosignals available, Electro Myo Gram (EMG) signals are used for their accuracy. The system then mimics the gestures using a robotic manipulator.
- An Amrita research paper titled Real-Time Monitoring and Detection of Heart Attack using Wireless Sensor Networks was awarded the best paper at SENSORCOMM 2010, the 4th International Conference on Sensor Technologies and Applications. Authored by Kala John K., third semester M. Tech. student of Amrita's Wireless Networks and Applications programme and Dr. Maneesha V. Ramesh, Head of the Department, the research paper will be included in IEEE Xplore. Dr. Maneesha traveled to Venice in Italy during July 18 – 25, 2010 to present the paper at the conference.

- Students from the Amrita School of Engineering at Amritapuri were recently awarded a gold medal for their project – a gesture-based wheelchair. Besides being honored by the special Intel employer’s award for best project, they were placed third at the Intel India Embedded Challenge (Aug 2010). The company provided Intel Atom kits and funding of Rs. 5000 to each of the selected teams including Amrita. The Intel research centre prepared a case study on their efforts.
- 30 students, as part of the India 4EU programme that comes under the broader umbrella of Erasmus Mundus, the extensive faculty-student exchange programme funded by the European Commission, went to Europe. The students include those studying for their B.Tech., M.Tech. and M.B.A. degrees in Amrita. They completed part of their coursework in European Universities in Finland, France, Germany, Italy and Sweden. The students spent about ten months at the host university, taking classes in their respective disciplines and also participating in field and research projects.
- A student paper authored by B.Tech. (ECE) students of Amrita’s Bangalore Campus was accepted for presentation at the Third International Conference on Anti-counterfeiting, Security, and Identification in Communication (ICASID 09) held at the City University of Hong Kong, August 20-22. Amrita students, B. Sriram and R. Prashanth Iyer, travelled to Hong Kong in August 2009 to present their paper titled, “Mark Sheet Authentication using 2D Barcodes and Digital Signatures”.
- Amrita students and faculty recently traveled to Beijing in China to present five papers at the 2nd IEEE International Conference on Computer Science and Information Technology (ICCSIT) in Aug 2009.
  - Rajesh Kannan Megalingam, Shekhil Hassan T, Vivek P, Ashwin Mohan and Tanmay Rao M, Power Consumption Reduction in CPU Datapath using a Novel Clocking Scheme.
  - Rajesh Kannan Megalingam, Nived Krishnan, Arjun Ashok V and Arunkumar M, Highly Power Efficient, Uncompromised Performance Cache Design Using Dual-Edged Clock.
  - Rajesh Kannan Megalingam, Deepu K B, Iype P Joseph and Vandana Vikram, Phased Set Associative Cache Design For Reduced Power Consumption.
  - Aswathy Prasad, Kamyia Krishnan, Karthika, Parvathy and Rajesh Kannan Megalingam, Low Power Lossless Compression of Real Time Mpeg4 Video Encoding And Decoding Using Vhdl And Matlab.
  - N. Lalithamani, Dr. K. P. Soman An Effective Scheme for Generating Irrevocable Cryptographic Key from Cancelable Fingerprint Templates.
- Amrita’s Chakshuyaan, (vehicle-with-eyes), was adjudged the best project at TechTop 2009, a national contest for engineering students organized in Thiruvanthapuram. Over 200 teams participated from all over India, in Aug 2009. Amrita’s team (Shreyas Narsipur-ME, Shibesh Dutta-ECE, Vandana Vikram-ECE, Raghu Menon-EEE, Apoorv Singhal-BBM and Sashi Sekhar-BBM) from the Amritapuri Campus won the top prize. The team carried home a cash award of Rs. 1 lakh.

- In Aug 2009, final year Polymer Engineering students C. Raja Sundar, M. Aravind and B. Arun received the first prize and a cheque for Rs. 50,000 for their Design Project / Model titled, Design and Fabrication of a Spin Coater Machine for Thin Film Coating and its Potential Applications. The competition, organized by Bannari Amman Institute of Technology, Erode District in Tamil Nadu, drew 92 contestant teams from all over India. Subsequently, the Spin Coater Machine also bagged the first prize in a Project Design Contest at SHASTRA 09, an International Symposium organised by IIT Madras during Sep 30 – Oct 4, 2009. This time the students received a cash award of Rs. 15,000.
- Students from four Amrita campuses won several prizes in the Computer Society of India's 25th National Student Convention (CSI-NSC) at Coimbatore on September 24 and 25. First prize in Code Debugging Contest, first prize in Logical Reasoning Competition, second prize in Technical Quiz — all these were won by Amrita students. Nearly 750 students from over 100 colleges nation-wide participated. Reverse Engineering — a paper written by Amrita Murali, Anjali Balakrishnan and Sreedhu Krishnan of the Department of Computer Science, Amritapuri won the best paper award in the Software Engineering track. Amrita engineering students won second best paper awards in the Research Scholar track as well as the Networking and Cybersecurity tracks. In addition, Apoorva Prabhu and Divya S. N., students of BCA (Bachelor of Computer Applications) in Mysore won the third best paper award for their paper on Image Processing Techniques in the Soft Computing track.
- Arjun Menon, Sanju Sajan and Abhinav R., second-year students of B. Tech. (Mech.) from Amrita's Coimbatore campus were awarded the first prize in the Aero Modeling Competition conducted as part of the Convention of the Society of Automotive Engineers (SAE), in Oct 2009.
- Athira Krishnan, 2nd year BBM student at Amritapuri, published "Ente Ezhuthamaykku", a collection of 27 poems and a short story in Malayalam. It was released at a special function organized at the Amritapuri campus on November 3, 2009. Athira has won several awards in district and state level competitions. She was thrice honored by the Kavyodhaya award that has been instituted to encourage new poets.
- Dr. Dnyanesh Lad and Dr. Kiran, post-graduate students at the Amrita School of Medicine in Kochi, won laurels for their alma-mater when they placed second in the nation-wide orthopedics quiz at Bhubaneswar, in Nov 2009.
- Mr. Kannappan, MBBS student won the Best Poster Award (titled "Isolation and validation of biomarker MMP1 from salivary transcriptome for early diagnosis and prognosis of oral cancer") during the: ACBICON - 2009, the National Conference of Association of Clinical Biochemists of India, held from 5-11-2009 TO 7-11-2009.
- The work presented as a poster titled, "Gold Nanoparticles Modified TiO2 Nanotube Arrays for the Selective Determination of Ascorbic Acid", at the International Conference on Advanced Nanomaterials and Nanotechnology (ICANN-2009) conducted at IIT Guwahati during December 9-11, received the best poster award. The work was co-authored by Mr. T.G. Satheesh Babu (Faculty, Amrita School of Engineering, Coimbatore) and Mr. P.V. Suneesh, Ph.D. student.

- The Baja SAE contest, open to all engineering students, is a contest for designing an all-terrain vehicle. Amrita students from the Coimbatore campus competed in the contest with 80 other teams from across the country. Amrita received a prize for their Silver Light Car; it was the second-most economical car entered in the contest, held in February 2010. The students made this winning model under the leadership of their faculty mentor, Dr. Thirumalini.
- Final-year students, Venkat Krishnan and Vineeth Sharma of B.Tech. (ECE), Amrita School of Engineering, Amritapuri, won the first prize in a contest to determine the Best Hardware Engineer, defeating nearly 30-40 other student teams that competed in a tech fest conducted by SCMS Engineering College, Kochi, in February 2010.
- Twenty-four students from three Amrita campuses — Amritapuri, Bangalore and Coimbatore were selected in February 2010 to spend up to ten months at various European Universities, as part of the European Union's India4EU programme. Selected Amrita students were to study at University of Trento (Italy), University of Bologna (Italy), Politecnico di Milano (Italy), Aachen University (Germany), Helsinki University (Finland), Helsinki University of Technology (Finland), Grenoble Institute of Technology (France) and KTH, Royal Institute of Technology (Sweden).
- IEEE student members of the Amrita School of Engineering won the first and second prizes at the "Humanitarian Technology Challenge Student Poster Competition", conducted as part of International Conference on Humanitarian Technology Challenges of the 21st Century, held in Feb 2010. ECE students, Amrita School of Engineering, Amritapuri, Hareesh S, Navneeth K, Akash P and Vivek Vijayan won the first prize that included a cash award of Rs. 5000/- and a certificate of appreciation. The students' poster depicted a Robotic Coconut Tree Climber. Ramesh N Nair and Sai P Manoj, also ECE students, were awarded the second prize, a cash award of Rs. 3000/- and a certificate of appreciation, for their Wireless Vehicular Accident Detection and Reporting System.
- Sowmya Narayan graduated from the Amrita School of Engineering at Amritapuri with a B.Tech. degree in Electronics and Communication Engineering in 2008. Unlike many of her peers who joined the IT industry, In Feb 2010, she was awarded the Wipro Prodigy Award for excellence at work. Only two or three new hires are given this award of the thousands of the people Wipro recruits annually. The only requirement is that they should have made some extraordinary contribution, while working on a project. Soumya was part of the VLSI (Very Large Scale Integrated Circuits) Team at Wipro that was working on a client project for NEC Global, one of the world's leading providers of Internet, broadband network and enterprise business solutions.
- Ms. Beena presented her work as a paper titled, "New PVC Membrane Sensor for Neodymium (III) Based on N1, N2 Bis (Salicylidine) Butane-1, 4-Diamine", at the 15th National Convention of Electrochemists, at VIT, Vellore, in March 2010. The presentation received the best paper award at the conference.
- B.Tech Chemical Engineering students at the Amrita Coimbatore campus, N. Vijayalakshmi, Harihara Subramaniam and M. Suhanya, exhibited

their innovation in designing a novel heat exchange system that won them the 3rd prize in the event “DELTA T” conducted as part of the technical festival “Pragyan” at NIT Trichy, in February 2010.

- Balagopal R., who just graduated from the Amrita School of Engineering at Amritapuri with a B.Tech. degree in Information Technology, was awarded the Huygens Scholarship, in May 2010, that enabled him to complete a two years masters’ programme at Vrije University (VU) in Amsterdam.
- Best paper awards were won by Dr. Mahija Janardhanan and Dr. Tina Elizabeth Jacob of the Amrita School of Dentistry at the 7th National Conference of Indian Association of Forensic Odontology convened in Chennai, in May 2010.
- Third-year students of Computer Science, Arjun Vasudevan, Asha S. Benny, Niranjan S. Nair and Shabana K.M., developed Karshik 2.0, a new web application that works to allow a farmer to select his/her location from a map where he/she plans to start farming. The application suggests crops that can be grown in the area considering the nature of the soil and climatic conditions. Also information is provided about the nearest Centre from where seeds can be obtained. The students’ project has already attracted the attention of many. It was profiled in several leading newspapers including The Hindu Business Line, Economic Times and Malayalam Manorama.
- Three students of our Cisco Networking Academy participated in the Asia-Pacific NetRiders Skills Competition conducted by CISCO at Bangalore in Nov 2008. They cleared three rigorous rounds of hands-on skills and theory tests and were selected to represent India in the final round. The final round was conducted virtually using Cisco’s web technologies on Nov 26 and 27, 2008. Teams from 15 different countries in the Asia-Pacific Region competed, including the team from Amrita.
- A team of students from the Amrita School of Dentistry won the 2nd overall championship prize in “Fusion Chettinad,” an inter-collegiate cultural fest in Chennai in Dec 2008. Twenty six teams from medical and dental colleges in Andhra Pradesh, Karnataka, Kerala, Pondicherry and Tamil Nadu had participated.
- A Comparative Study of CMOL Technology and FPNI Technology, High Speed and High Responsivity CMOS Image Sensors, Study of Variation in Process Parameters and Supply Voltage in Various CMOS Technologies, Effects of Substrate Coupling in Mixed Signal ICS — these are the titles of four papers that were submitted by Amrita students and accepted for presentation at the 2008 Regional Student Conference on Research and Development to be held on 26th and 27th of November, 2008. Nine students of 3rd year ECE (Electronics and Communication Engineering), from Amritapuri Campus travelled to Malaysia, with their teacher and mentor, Br. Rajesh Kannan. One of their papers titled High Speed and High Responsivity CMOS Image Sensors was awarded the best paper prize in the conference. It was chosen for this honor from nearly forty papers submitted by teams of undergraduate students from the best universities in the sub-continent. The paper was co-authored by Venkat Krishnan, Mithun M, and Rahul Srikumar, all ECE students currently

- enrolled in the 3rd year ECE degree programme. The student team was guided and mentored by Br. Rajesh Kannan.
- Megha Agarwal from the Amrita School of Business became the only Indian delegate at a Market Research Conference held in Singapore in 2008. The conference was organized by ESOMAR, the European Society for Market Research.
  - Amrita University became an active partner to the European Union initiative, The Erasmus Mundus External Cooperation programme. In this consortium of European and Indian universities, Amrita sent over fifty students and faculty in 2008-09 to different universities in Europe to participate in short-term and long-term research projects.
  - B.Tech. (ECE) students from the Amritapuri campus, Shibesh Dutta and Sivaramakrishnan R, spent their final semester at IIT Bombay, conducting research in the cutting edge of nano device fabrication. The students spent 8 weeks at IIT Bombay. Dr. Bala Shankar and Dr. Sundar (faculty mentors from Amrita School of Engineering, Amritapuri) also traveled to IIT Bombay at different times to guide the students. The students fabricated and studied the electrical characteristics of MOSCAPs made of titanium oxide and hafnium dioxide stacks. The results from the work already completed were accepted for presentation at the IEEE International Nanoelectronics Conference (INEC 2010) in Hong Kong.
  - Thirteen papers from the Computational Chemistry Group of Computational Engineering and Networking (CEN) (Coimbatore campus), were accepted for presentation at the National Symposium on Mathematical Methods and Applications (NSMMA-09). Being organized to celebrate the birth anniversary of the gifted Indian mathematician Srinivasa Ramanujan, the Symposium will bring together renowned mathematicians and researchers from reputed institutions worldwide at IITM-Chennai on December 22, 2009. The contributing students were from CEN and the Departments of Computer Science and Engineering, Electronics and Communication Engineering, Mechanical Engineering.
  - Ms. Amulya Bharadwaj, BBM (Amrita School of Arts & Sciences, Mysore), was selected for the Karnataka State Gymnastics Team.
  - Engineering students from the Amritapuri campus Varun Ramani, Amreth C., Ajith and Aravind R. were placed first among students from all colleges in Kerala, and sixth among students from all colleges in India in the 2008 Great Mind Challenge Contest. The contest saw participation from over 15000 teams from all over India. The Amrita students designed and built an Online Crime Reporting System. Christened IRIS v1.0, their system was based on the J2EE platform.
  - Student members of Amrita Sanjeevani, the seva association at the Amritapuri Campus, put up a stall in the 3<sup>rd</sup> week of Dec 2008, on the ashram premises, to sell X-Mas and New Year greeting cards. The stall remained open during Amma's darshan hours on Saturday and Sunday. Over Rs. 12,000 was raised, which was used to fund the education of poorer students. Several students from all 4 schools at the campus — Arts & Sciences, Ayurveda, Biotechnology, Engineering — had worked over one month making these products. On most evenings they had gathered at the Amrita Sanjeevani workshop from 5:00pm to 6:00pm, helping to convert waste into something useful.

- Shilpa Dinesh Nair, a third year ECE student at the Amrita School of Engineering in Coimbatore was selected as the Best Speaker of Business English at a National Level ESOL Competition organized by the Cambridge University in association with the British Council of India (Dec 2008). Students from over 50 colleges in the country were invited to participate in the final round held in Chennai. They were each asked to give a short presentation on how to promote India as a tourist destination. Among all 24 students finally short-listed, Shilpa of Amrita bagged the top honors. Shilpa attended the Asia Region International Finals in Singapore in February 2009. As the Indian national level winner, she was also eligible for a fully sponsored one - week finance course at the London Metropolitan University, supported by the London Mayor's office.
- Second year B.Tech. Mechanical Engineering students (Praveen R., Abhijith Vijayan and Sreerag S.R.) from Amrita School of Engineering (Amritapuri campus), won the first prize at a tech fest organized at NIT Trichy in Feb 2009, for their innovative design to cool water without using electricity. They won the top prize after defeating teams from over 50 engineering colleges that also participated in the contest.
- Varrun Ramani, final-year student of B.Tech. Computer Science and Engineering at the Amritapuri campus was awarded the first prize in the IBM XML Superstar Contest in March 2009. He was ranked first in an Inter-Amrita ACM coding contest. His team qualified in two successive years to participate in the Asia Regionals of the ACM-ICPC, and was 32nd in Asia in 2008 and 20th in 2009. His team placed 6th in India for developing a project titled "Online Crime Reporting System" in IBM's Great Mind Challenge 2008, defeating 15000+ teams.
- During the second week of February 2009, Vignesh K. and Ganapathy Raman K., 2<sup>nd</sup> year ECE students (Amrita School of Engineering, Coimbatore), participated in a technical symposium at the Coimbatore Institute of Technology. The team competed with over 50 teams, and won the first place in an event named, "Yours Digitally". Based on Signal Processing, the event included quiz rounds with questions on network functions, convolutions, structure of filters and functions and graphs.
- In Feb 2009, Karthik D. and Sai Pramod U., 2nd year ECE students (Amrita School of Engineering, Coimbatore), participated in a national level technical symposium conducted by the IEEE Student Branch of PSG Institute of Technology. The team beat nearly 70 teams to emerge as the overall winner in Circuit Design.
- In March 2009, several Amrita School of Engineering (Coimbatore) students participated in a fest, billed as an international eco-friendly event, at the PSG Institute of Technology. Balasubramanian R. and Vignesh K. won the second prize in a programming contest based on MATLAB, defeating nearly 150 other teams. R. R. Shrihari and Rahul R. M. won the third prize in a puzzles contest. Ganapathy Raman K. won the second prize in Mathemagic.
- Harish Dixit, Kartheek Kota and Aditya Nair, 2nd MBA students from Amrita School of Business (Coimbatore), went to the University of Paderborn as exchange students in April 2009. All three are engineers, with B.Tech. degrees in Mech., Electrical & Electronics, and Computer Science & Engg., respectively.

- Merin Cherian, Rajasree PH, Vibha M, Aneesh, Aneesh TP, Sonal Sekhar M, Indian Herbal Drug for General Healthcare: An Overview, National Conference on Novel Concepts in Pharmaceutical Research, Kerala, February 21-22, 2009. Awarded 1st prize.
- Mohamed Hisham, Sathyanarayanan S, Aneesh TP, Sonal Sekhar M, Secrets of Anti-Aging Science, National Seminar on Recent Trends in Pharmaceutical Sciences and Education, November 28, 2008. Awarded 2nd prize.
- Kishore Kopparapu, a second-year M.Tech. student at the Amrita School of Engineering, Coimbatore, was awarded the top prize for a paper written by him and his faculty guide, A. Baskar, at the National Conference on Information Sciences (NCIS 2009) organized by the Manipal Centre for Information Science, Manipal University on April 24, 2009. The paper was titled, “Fusing SAR Images using "A Trou" Algorithm Based Wavelet Decomposition”.
- Swati B., 3rd year student of Electrical and Electronics Engineering at Amritapuri, received a fellowship for her internship at the Swiss Federal Institute of Technology (ETH) in Zurich, one of the foremost research institutions in Europe, in the summer of 2009. Swati worked in image processing in Zurich. Her internship was under the guidance of Dr. Ivo F. Sbalzarini, who heads an interdisciplinary research group at ETH that focuses on the analysis, modeling and simulation of complex real-world systems, particularly from cell biology.
- Four students from Amrita School of Business, Coimbatore — Gajanan Sapate, Kiran Sekhar, Sarthak Behura and Varun Handa — spent two months (April & May 2009) at Sofia University, the oldest and largest scientific centre in Bulgaria, along with Prof. Prashant R. Nair (Professor deputed from Amrita Vishwa Vidyapeetham to Sofia University, as visiting faculty).
- Avinash Joshi, a final-year B.Tech. student of Information Technology at the Amritapuri Campus, was chosen in June 2009, as the only student from India to attend the JavaOne 2009 Developer Conference in San Francisco, his travel and participation expenses fully sponsored by Sun Microsystems.
- For the third consecutive year, students from the Amrita School of Dentistry won the overall championship in stage events at the inter-state dental students’ fest organized by the Kerala Dental Association, in June 2009.
- Vivek P. Eswar, Kartick S. and Sarath Vijayan went to Singapore in July 2009 for graduate studies. The three graduated from Amrita with their B. Tech. degrees in EEE, and got admitted to the M.S. Computer Control and Automation programme at Nanyang Technological University (NTU) in Singapore. NTU’s engineering programme is ranked 15th in the world.

## Special Recognitions – Quotations

It is natural that Amrita University's phenomenal growth, with uncompromising high standards, has been noticed in India and across the world, and accolades have poured in. A sample of the recognitions received from some very eminent personalities is given below:

*"Amrita University has a major role to play in transforming our society into a knowledge society through its unique value-added education system."*  
Dr. APJ Abdul Kalam, Former President of India, Bharat Ratna and Distinguished Scientist.

*"I congratulate Amrita and IIT Bombay for training 10,000 teachers nationally in one workshop using A-VIEW, institutes should collaborate like this with a national effort to make India the nation it deserves to be."*  
Shri Kapil Sibal, Union Minister for Communications & Information Technology, Government of India.

*"At AMRITA, There is this atmosphere of people, who are dedicated to a cause, people who want to do something for the community, people who want to serve humanity."*  
Dr. C.N.R. Rao, Bharat Ratna, National Research Professor Linus Pauling Research Professor, & Honorary President - Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore.

*"It is extraordinary what AMRITA has been able to accomplish in its short history. To have developed in the space of only 15 years, a first-class research institution with the highest accreditation rating from the national accreditation agency is remarkable. I know of no other institution in India with a comparable record of achievement."*  
Dr. Satish K. Tripathi, President, State University of New York at Buffalo.

*"When I look at what AMRITA is, its mission, the hospitals, the various campuses, there is a close synergy between what Princeton wants to do and what AMRITA is doing."*  
Dr. Maria Klawe, Former Dean-Engineering, Princeton University & President, Harvey Mudd College.

*"As a young institution that is unburdened by history and full of bold ideas for the future, AMRITA has much to teach its older counterparts. Truly, you are building a world-class university for the 21st century, and my SUNY colleagues and I are deeply impressed by the success that you clearly already are achieving."*  
Dr. John Simpson, Former President, State University of New York at Buffalo.

*"Amrita provides a holistic education to students. With divine blessings, I am sure that the university will bring laurels to the country and become an important model in higher education. Across the global level, we need to have Indian institutions in the academic ranking lists. Amrita has all the ingredients and the critical mass to move forward and aspire to a rank in the global lists".*  
Director of NAAC, Prof. H.A. Ranganath, who was the chief guest for the Campus Day of Amritapuri campus in April, 2013.

## AMRITA STRENGTHS

### Curricular Aspects

- AMRITA Vishwa Vidyapeetham has a multi-disciplinary, multi-campus structure offering the entire gamut of educational programmes with 150 undergraduate, postgraduate and doctoral programmes in Engineering, Business, Medicine, Dentistry, Pharmacy, Nursing, Journalism, Biotechnology, Information Technology, Arts and Sciences, Health Sciences, Teacher Education, Microbiology, Hospital Management, Visual Media Studies, Mass Communication, Social Work, Nanosciences and Ayurveda.
- AMRITA Vishwa Vidyapeetham has taken a lead in introducing several innovative and interdisciplinary programmes, some of which are the first of their kind in India. Some of the innovative programmes include M.Tech. in Cyber Security; M.Tech. in Nanomedical Sciences; M.Tech. in Molecular Medicine; M.Sc. in Medical Informatics; M.Sc. in Bioinformatics; Master of Medicine in Emergency medicine; PG Diploma in Clinical Research, etc.
- Strong post graduate programmes in medicine like MD, MS, MCh, DM, Fellowships, etc., in super specialty and inter-disciplinary areas, which are rated best among the programmes in India.
- M.Sc. and B.Sc. programmes in allied health sciences are becoming increasingly popular.
- Participation of industry in curriculum development with members in Board of Studies
- Joint development of elective courses with Infosys, Tata Consultancy Services (TCS), HCL, Robert Bosch, etc.
- Value Added courses like Cisco Certified Network Administration (CCNA), Red Hat Certified Engineer (RHCE), Tally ERP, CFD and CNC programming using Edge CAM.
- Special courses and electives like Communicative English, Technical Communication, Business Communication (Elective), English for Professional Communication, Indian Thought through English (Elective), Indian Thought through English for all engineering and humanities programmes to improve communication skills and thereby employability.
- “Life Skills”, a 3-credit course covering Logical & Analytical Reasoning Skills, Verbal & Communication Skills and Soft Skill, is offered for all programmes except Health Sciences. The curriculum has been designed with industry input and is regularly reviewed based on corporate feedback. This empowers the students to think logically, communicate effectively, and perform well in campus placement, and makes them industry ready and employable.
- Courses on Cultural Education, Yoga, and Meditation, which according to our alumni, develop their emotional maturity to face complex situations in the work place.
- Optional courses in foreign languages like German, French, and Japanese, provided in the curriculum empower students to take up global careers.

- Semester-long Internship in leading national research agencies and industries and Semester-long studies in top universities abroad, have been facilitated for various academic programmes.
- Research-oriented UG and PG projects providing early exposure to research culture due to the extensive projects with various national agencies.
- Variety of options like summer courses, runtime redo, and contact courses, for slow learners.
- Mandatory requirement for every PG student to publish a good quality paper in either a Scopus listed international journal with high impact factor, or at least a Scopus listed conference.
- Mandatory requirement for every Ph.D. research scholar to publish a good quality paper in either a Scopus listed international journal with high impact factor or at least a Scopus listed conference every year, after advancing to candidacy and completing the comprehensive examination.
- Amrita Institute of Medical Sciences (AIMS) hospital attached to the university is among the top five hospitals in the country in Cardiac Care and Cancer Treatment, Clinical Programmes, and Education.
- Many Amrita Medical Education and clinical programmes, like Endocrinology, Neurology, Neurosurgery, Pediatrics, Respiratory Disorders, Digestive Disorders, Ophthalmology, Kidney Disease, ENT, Urology, Psychiatry, and Gynecology, are rated among the top 10 in India.
- The Diabetic Foot Care programme offered in Amrita Institute of Medical Sciences is the most comprehensive programme of its kind, covering all aspects of foot care, from prevention to surgery, prescribing appropriate foot wear for almost 6000 outpatients per month, and 80-100 major diabetic foot surgeries performed per month.
- AMRITA is the only centre in India offering programmes like Fellowship in Diabetic Foot Surgery, MS/Ph.D. in Diabetes Sciences and Diploma in Diabetes Education.
- Active environmental studies programme with course on Environmental Studies being taught for approximately 2000 students every year throughout the university.
- The specialization, “Child Rights and Child Protection”, first of its kind in India, with close field work supervision, is part of the Social Work programme.
- Twinning and collaborative programmes with various foreign universities like Vrije University, Netherlands; State University of New York (SUNY), Buffalo; KTH-Royal Institute of Technology, Stockholm; University of New Mexico; Polytechnic University of Catalonia (UPC), Barcelona, etc,

### **Teaching-Learning and Evaluation**

- Qualified, experienced, motivated and dedicated team of faculty members with a balanced blend of teaching and research interests, and diversity in terms of experience (teaching, research, administration and industry)
- Almost 35% of faculty members possess doctoral qualification or terminal medical degree, which is the best among private universities in India.
- Most of the faculty members without a doctoral degree are pursuing a Ph.D. programme either in Amrita Vishwa Vidyapeetham or outside.

- Excellent staff-student ratio of 1:10 is one of the best prevailing in the country in the private universities.
- AMRITA has influenced a Reverse Brain Drain. Inspired by the Chancellor, Sadguru Sri Mata Amritanandamayi Devi (AMMA), top ranking professors and doctors from the world's best universities like Oxford, Harvard, Berkeley, Stanford, Purdue, State University of New York (SUNY), Buffalo; University of California, San Diego (UCSD), University of California, Irvine; University of Illinois, Urbana Champaign; University of Texas, Dallas; University of California, Los Angeles (UCLA); Cornell University; University of Massachusetts, Amherst; Stern School of Business, New York University; University of Southern California, Los Angeles; University of Texas, Austin; Simon Fraser University, Canada; Michigan State University; INSEAD-France, National University of Singapore, Iowa State University, University of Berne, etc., have returned to serve the country, joining Amrita Vishwa Vidyapeetham. AMRITA offers the ideal ambience for them to pursue their interests in developing technologies, solutions and services, which can be deployed to address various pressing problems in India.
- Faculty members who have joined Amrita School of Medicine from centres of healthcare excellence like Memorial Sloan Kettering, New York University, Oxford University, Stanford University, UCLA, University of Calgary, University of Michigan, Washington University, Alabama Heart Institute, Birmingham University, Cambridge University, CCMB, Cleveland Clinic, Harvard University.
- Availability of highly accomplished adjunct faculty members from top universities in the world through Amrita Center for International Programmes. This includes Nobel Laureate Dr. Leland H. Hartwell, who is a Distinguished Adjunct Professor at Amrita Vishwa Vidyapeetham, in the School of Engineering and School of Biotechnology since 2011. He visits our university every year to deliver a series of lectures for researchers, faculty, and students.
- To promote research culture among faculty, it is mandated that they publish a good quality paper(s) in a Scopus listed international journal(s) with high impact factor or Scopus indexed conference(s) every year.
- An attractive pay structure for enhances our chances and competitiveness in hiring new faculty, in a market scenario where there are a limited number of highly qualified, experienced, and research oriented teachers.
- Generous policy of sponsoring faculty members for international and national seminar, conferences, and workshops in premier institutions, to expose them to latest technological & research developments.
- Faculty members are in international and national leadership positions for various national task forces, national missions and professional bodies like Nano Task Forces of DST, DBT, ICMR, Food Authority of India, Standing Committee, National Mission on Education using ICT of Government of India, Steering Committee to revamp vocational education in India, CCIM, IEEE, SAE, and CSI.
- Very low staff turnover.

- Each school of the university organizes Faculty Development Programmes (FDP) for professional enrichment as well as orientation programmes for newly joined faculty members.
- Extramural and distinguished lecture series in various schools of the university.
- Eminent personalities have addressed the convocation of AMRITA like Nobel Laureates, Dr. Martin Chalfie and Dr. Leland Hartwell; Dr. D. Purandeswari, the former Minister of State for Human Resource Development of Government of India; Dr. Gururaj Deshpande, renowned Silicon Valley entrepreneur and Co-Chair of the US President's National Innovation Council; Dr. C.N.R. Rao, Bharat Ratna, eminent scientist and former director of Indian Institute of Science; Mr. S. Ramadorai, Advisor to Prime Minister of India on Skill Development and Vice-Chairman of Tata Consultancy Services (TCS); Mr. K. Venkataramanan, CEO, Larsen & Toubro; Mr. Kris Gopalakrishnan, CEO of Infosys; Dr. Srikumar Banerjee, Chairman, Atomic Energy Commission of India; Dr. T. Ramasami, Secretary, Department of Science and Technology of Government of India (GOI) and Mr. R. Chandrashekhar, Secretary, Ministry of Information Technology of GOI.
- Faculty involvement and participation in all academic, research and administrative bodies and decision making processes of the university.
- High employee retention ratio by way of an effective employer-employee communication path, transparent management, scheduling of staff meetings, inviting constructive feedback and encouraging / complimenting staff members of their achievements.
- Industry involvement in FDPs and Faculty Enablement Programmes with Infosys, HCL, Tata Consultancy Services (TCS), National Aerospace Laboratories (NAL) offering FDPs on latest trends and competencies.
- A well planned formal system of creating a course outline and course evaluation has been created.
- Bright and heterogeneous students from all the parts of the country.
- Excellent ambience that encourages creativity and participation in a variety of social, co-curricular and extra-curricular activities, thereby nurturing talent in a disciplined atmosphere.
- Transparent admission process through competitive entrance examinations.
- Strong demand for admission to various programmes. Over 30,000 students appear for the B.Tech. entrance examination for around 2000 seats available. Over 5000 students appears for the MBBS entrance examination for 100 seats available.
- Amrita Entrance Examinations - Engineering and Medical are conducted in various centres all over India. The entrance examination is held in over 75 cities including remote locations like Andaman and Nicobar Islands.
- A wide range of under graduate assistantships and scholarships are available to support like Amritavidyanidhi scholarship scheme for B.Tech. students.
- Department of Student Welfare & Affairs in each campus provides counseling support for students with the help of trained counselors and psychologists. This department also engages with parents of students.

- Extensive ICT usage for facilitating teaching-learning process using in-house developed academic ERP system, AUMS (Amrita University Management System) using the module, Academic Administration system which encompasses course registration, management & evaluation, grading, results and certificate generation across all campuses and programmes with central monitoring at the University headquarters.
- Systematic evaluation process supported by AUMS allows timely publication of results, i.e., within 10 to 12 days from the last day of the end semester examination.
- Slow learner coaching programme.
- Academic rigor and discipline reflected in the system of Continuous Assessment enabling close monitoring of students performance.
- Various super-specialty procedures and surgeries at Amrita Institute of Medical Sciences (AIMS) hospital like Liver Transplant, Kidney Transplant, Heart Surgeries (Surgery of Aortic Aneurysms, Complex Lungs and Esophageal Resections, Complex Vascular Reconstructions, VAT, Congenital Cardiac Surgery, Arterial switch operation, Ross & Rastelli operations, Partial Median Sternotomy, Limited Posterior Thoracotomy), Peripheral Vascular Surgery, Laparoscopic Surgery, Prenatal Surgery, Neurosurgery and Stereotactic Nerve Surge provide health sciences students unique exposure and access to cutting-edge tertiary medical care education.

### **Research, Consultancy and Extension**

- Right from inception, research has been a very significant activity at Amrita Vishwa Vidyapeetham and AMRITA Institute of Medical Sciences (AIMS). The research activities at AMRITA are directed towards societal, humanitarian and community development & relief.
- Many Centres of Excellence have been started in cutting-edge areas like Nanosciences & Molecular Medicine, Advanced Materials & Green Technologies, E-learning, Haptics, Biostatistics, Biomedical Engineering, Environmental Sciences, Virtual Labs, Wireless Networks & Applications, Computational Engineering & Networking, Cyber Security, Cancer Care, Educational Technologies, etc., with the support of major national laboratories, industry leaders and agencies like TIFAC, DST, ICMR, ISRO, DRDO, DBT, DIT, DRDO, Microsoft, Hewlett Packard, Media Lab Asia, Infosys, MDS Pharma, Biocon, etc.
- AMRITA is also a partner in the Indian government's Ministry of Human Resource Development's National Mission for Education using Information and Communication Technology (ICT) for various national projects in Haptics, Virtual Labs, Educational Resource Planning, Natural Language Processing, and interactive e-learning systems, along with Indian Institutes of Technologies and Indian Institute of Science (IISc).
- The faculty members of AMRITA have published more than 150 books, 300 book chapters and 3000 research papers in reputed international and national journals in the past ten years.

- AMRITA has received grants from various governmental and private funding agencies to the tune of more than Rs. 180 crores in the past ten years.
- AMRITA has more than 100 major research projects funded by government and private agencies.
- AMRITA has also bagged or filed fifty major patents and inventions in the past few years which include Adaptive and Automatic Insulin Pump, Wireless Telematics, Virtual Private Network (VPN), Amrita Hospital Information System (AHIS) etc. The university also has centralized support for patent applications and processing.
- Research and development accomplishments with societal focus include an adaptive insulin pump for the benefit of diabetic patients, which is to be made available for a fraction of the cost of similar devices currently available in the market; innovative product development in photovoltaics and storage devices using nanomaterials, which are primarily aimed at solving energy problems; low-power wearable wireless ECG monitoring device; low cost wearable safety device for women; India's first-ever wireless sensor network system for predicting landslides at Munnar in Idukki district in Kerala, etc.
- AMRITA's Tele-medicine Network is one of the largest networks in India established with the support of Indian Space Research Organization (ISRO). The telemedicine service is connected to 60 major hospitals in India and 9 international centres, including remote locations in India like Lakshadweep, Leh etc. This is also one of the five centres selected by the Ministry of External Affairs, Government of India for providing telemedicine, tele-consultations, tele-surgery and Continuing Medical Education (CME) and distant medical education programmes all over the world.
- In line with the trend of today's classrooms becoming virtual, global and personalized, AMRITA has developed a unique E-learning system, "Amrita Virtual Interactive E-Learning World", A-VIEW, a cutting edge video conferencing software system, customized for universities. This system is the preferred one for the National Mission on Education using ICT of the Government of India, and is being currently deployed at 600 universities and 30,000 colleges all over India free of cost. The system addresses the most pressing issue of higher education in India today, namely, the shortage of highly qualified and experienced teachers. A-VIEW brings classroom teaching, live from expert teachers and resource persons at reputed institutions as well as foreign universities to cater to students at numerous locations all over India.
- As part of institutional outreach, extensive outreach and support to many educational institutions all over India through participation in national distance learning programs (Online Gurukul, Ask a Question, Talk to a Teacher etc.), some inroads have been made towards R&D and/or applications of MOOC, Blended Learning, and Game-based learning.
- AMRITA's Centre for Nanosciences and Molecular Medicine is India's first centre focusing on the use of nanotechnology for biomedical and biotechnology applications. This centre is recognized today as a leader in Nanotechnology, Molecular Medicine, and Solar Cell research. The Centre also hosts a Nano Solar Centre for Excellence which focuses on innovative

product development in photovoltaics and storage devices using nanomaterials, which are primarily aimed at solving energy problems. Another thrust is to develop nano-technology in biomedical implants and low-cost biomedical devices.

- AMRITA has developed India's first-ever wireless sensor network system for predicting landslides at Munnar in Idukki district in Kerala. The system uses wireless sensor technology to provide advance warning of an impending landslide disaster, facilitating evacuation and disaster management. This system is being suitably modified to predict environmental pollution, disease outbreaks, and other disaster management situations. The Government of India has shown interest in deploying this system in all landslide prone areas, including the Himalayas, and the Konkan Region.
- An in-house Educational Technology Development Cell, Centre for Research in Advanced Educational Technologies (CREATE), applies innovative digital solutions to provide accessible & affordable educational technologies and instructional software for primary & secondary schools. It also builds solutions for universities with a focus on personalized assessment and learning such as the National Faculty Expertise System (NFES), computer-based medical simulation software, language learning using immersion, and a research grant management system. An intelligent tutoring and adaptive assessment program developed at CREATE has been deployed in over 45 Indian schools in rural regions and small cities in the neighborhoods. Government of India's Central Board for Secondary Education (CBSE) has recommended the Online Labs (OLabs), also developed by CREATE, for school experiments for all schools affiliated to this board, which is one of the largest in India.
- Another institutional research outreach programme is the Virtual Labs Research Centre, which focuses on intelligent development of virtual laboratories with state-of-the-art computer simulation technology, to create real world environments and problem solving capabilities. This is required to bridge the gap between institutions or industries that retain the physical laboratory, and economically challenged educational institutions in remote areas.
- A research centre of AMRITA, supported by the United Nations (UN) is AMMACHI Labs (Amrita Multi Modal Applications Using Computer Human Interaction). This is a centre of technological innovation breaking new ground in the field of computer-human interaction, developing applications designed to improve quality of life for the least fortunate amongst us. Even as India's economy booms and the demand for skilled workers rise, vocational training in India is effectively paralyzed by social stigma, budget constraints and inadequate numbers of trainers and materials. The approach that AMMACHI Labs is taking to provide training is unique. It allows people from all walks of life especially women to get trained in various trades like plumbing, fabric painting, etc., with innovative application of Haptics technology. AMMACHI Labs aims to augment skill development and life enrichment education thereby contributing to upliftment and empowerment of women.
- AMRITA has an established tradition of conducting high quality conferences, seminars and workshops by each department of the

university. This provides numerous opportunities for the faculty members to network with researchers / industry professionals / academicians, and to establish links with other professional societies.

- AMRITA has active tie-ups, MoUs and collaborations with over 75 universities in USA, Europe, Australia, Japan, etc., for joint research, collaborative centres of excellence, cross-continental projects, faculty, student and researcher exchange, broadcast of distinguished lectures using EDUSAT to several institutions and universities in the country. Some of these universities are among the best in the world like Harvard, Berkeley, Tokyo, University of California, Trento, Uppsala, etc.
- Seed funding and research initiation grants are provided for research promotion.
- Extensive support to research scholars and students to pursue Ph.D.
- Sabbatical leave for faculty members to pursue higher studies and research.
- Faculty members can do part of their research or Ph.D. abroad, leveraging the international programmes and MoUs of the university.
- In-house research journals and working paper series in medical, dental and business schools.
- A centre for spiritual studies launched with the objective of offering credit based academic programmes in all aspects of Sanatana Dharma, spirituality, and culture, at undergraduate, post graduate and doctoral levels, and also for engaging in research activities like the study of Sanskrit language and literature, study of the scriptures – Vedas, Upanishads, Bhagavad Gita, Shad Darshanas, etc., and study of arts, science, technology, literature and astrology from a spiritual perspective, thereby reinforcing that underlying principles in these disciplines are expressions of spirituality.
- As part of institutional outreach, facilities at the state-of-the-art Amrita Clinical Skills Simulation Centre and Medical Illustration department are being used by medical colleges all over India.
- AIMS has one of the nation's largest centres for liver and kidney transplants, and performs the third largest number of liver transplants in India.
- AIMS with a 100 bed international patients facility has become a centre for medical tourism with several foreigners availing the tertiary medical care facilities. Various major surgeries are performed at one tenth of the cost for similar surgeries in USA or Europe.
- Diagnosis of Inborn Metabolic Disorders (IMD) has been a long neglected necessity in India. It is estimated that 1 in 1500 neonates may be affected with this class of disorders. AIMS has understood the need for such a facility and now has a state-of-the-art Metabolic Disorders Laboratory. The centre, to date, has been instrumental in screening nearly 3000 newborns for IMD and has diagnosed rare disorders in nearly 2% of them. The laboratory is chosen as a part of the national newborn screening programme proposed by the Indian Council for Medical Research (ICMR).
- AIMS is a preferred location by multinational organizations to function as a centre in clinical trials. Numerous research protocols have been cleared/ongoing, out of which around twenty are part of international

clinical studies sponsored multinational pharmaceutical organizations. National organizations like ICMR, Department of Biotechnology, Department of Science and Technology, and state level organizations like, Kerala State Council of Science, Technology and Environment, CUPRD - Cochin, and State AIDS Control Society, are currently supporting AMRITA in various research programmes.

- Amrita Diabetic Welfare Association (ADWA) and Amrita Heart Foundation (AHF) have been established for the benefit of the general public.
- Extension centres and community centres of the hospital have been set up in various places like Mysore, Amritapuri, Njarackal, Kaloor as well as remote places like Kalpetta, Lakshadweep, Andaman and Nicobar Islands, etc.
- Regular medical camps are organized all over India as well as tribal areas for the benefit of poor and aged people. Palliative home care services as well as special camps like dental or cleft lip are also organized. SOS medical camps and rehabilitation programmes are organized on tsunami and earthquake calamities. Annually more than 150 medical camps are organized.

### **Infrastructure and Learning Resources**

- The University today has a total land area of about 1000 acres and built-up space of about 8 million square feet.
- Self-sufficient campuses are evolving into townships with all supplementary facilities like hostels, primary & secondary school, post office, hospital or dispensary, bank, ATM counters, shopping complex, travel desk, day Care facility for children of staff, canteens, guest houses, stores, sports facilities, medical stores, book stall, Stationary/Fruit/juice stalls, etc.
- The 1450-bed super-specialty hospital, Amrita Institute of Medical Sciences (AIMS) attached to the university, is a unique, state-of-the-art institution offering subsidized and free treatment of over Rs. 25 crores per year, to poor and needy patients. Its extensive infrastructure comprises 60 departments, 24 modern operating theatres, 210 well-equipped intensive care beds, a reference diagnostic clinical laboratory, including advanced Molecular Biology and Cytogenetics Labs, a state-of-the-art Diagnostic Imaging Centre and Research Facility. Patient care is enhanced by a fully computerized and networked Hospital Information System and a fully digitized Radiology Department. Since 1998, over 7.6 million patients have been treated of which 2.6 million received completely free treatment. Annual patient turnover touches an incredible figure of over 6,15,000 outpatients and nearly 54,800 inpatients. State-of-the art equipment and facilities in all medical departments on par with the best hospitals in India like AIIMS, CMC Vellore etc.
- Several inter-disciplinary Centres of Excellence in Nanosciences & Molecular Medicine, E-learning, Haptics, Biostatistics, Biomedical Engineering, Environmental Sciences, Virtual Labs, Wireless Networks & Applications, Computational Engineering & Networking, have been set up

with facilities being used by Faculty members across various campuses and disciplines in the university.

- Advanced laboratories set-up as part of the Centres of Excellence and research funded by national agencies like Landslide simulation laboratory (first of its kind in Asia), Wireless Sensor Network Laboratory, Cloud Security Laboratory, Cyber Physical Systems Security Laboratory, Ethical Hacking Laboratory, Multi-dimensional Data Analytics, Biometrics Laboratory, etc
- Industry sponsored labs in association with Agilent Technologies has set up a cutting-edge analytical centre named Amrita Agilent Analytical Research Centre at Biotechnology School, Amrita Cognizant Innovation Laboratory for Computer Vision & Image Processing , Microsoft sponsored Embedded Systems Laboratory; Robert Bosch - Automotive Electronics Laboratory; Atmel and ARM Micro-controller Unit Labs, etc., at Amrita School of Engineering, Coimbatore.
- Well-equipped central libraries in each campus with adequate books, journals, project reports, back-volumes, magazines, CD/DVDs and e-books. Subscription to Online Journals, Conference Proceedings & Standards viz., PubMed, MD Consult, IEEE, Science Direct, JGate, ASTM, ASME, ASCE, Access Engineering, ACM and Springer Link.
- State-of-the-art E-learning Studios in all campuses with satellite and A-VIEW connectivity to multiple institutions in India and abroad.
- Separate hostel facilities in all campuses for boys and girls. These hostels are equipped with hygienic mess halls, TV halls, night snack stations, indoor game facilities, phone booths, solar water heaters etc. Almost 80% of the students reside in hostels. For example, in Coimbatore campus, **there are nine hostels, two for girls and seven for boys, which can accommodate 6400 students. There are 1900 single rooms, 984 four-seater rooms, and 202 two-seater rooms in the hostels. PG students and final year UG students are allotted single rooms.**
- Access to the digital library of State University of New York (SUNY) at Buffalo, as part of the collaborative initiative.
- Fully computerized language labs to improve communication skills and employability of students.
- Unique Amrita Clinical Skills Simulation Centre and Medical Illustration department promoting hands-on medical education to help improve clinical skills of educators and students.
- AMRITA Hospital is the first in Asia to implement latest imaging technology, Picture Archiving and Communication System (PACS), as early as 1998.
- AMRITA Hospital is one of the first in India to implement Electronic Medical Campus (EMR).
- A Centre of Excellence for Advanced Materials and Green Technologies has been sanctioned by MHRD at Coimbatore campus.

### **Student Support and Progression**

- AMRITA Vishwa Vidyapeetham provides a holistic approach to provide 'Education for Life' in addition to 'Education for Living'. In addition to

providing the best possible education in terms of academic excellence, facilities, ambience, pedagogy and infrastructure, the education one receives at AMRITA instills and inculcates both values & virtues, while sensitizing them to the essential principles of spirituality.

- Orientation in Yoga, Meditation, and Cultural Education is provided to all students. This helps them achieve holistic development of mind and body.
- Strong co-curricular engagement of students through the conduct of national level inter-university tech fests and management fests like Anokha, Pragati (Coimbatore campus), Vidyut (Amritapuri campus), Asthra (Kochi campus), Aykya (Bangalore campus), etc.
- Students are encouraged to take membership and start student chapters of all major professional bodies in India and abroad, such as Confederation of Indian Industry (CII), IEEE, Society for Automotive Engineers (SAE), Association for Computing Machinery (ACM), Computer Society of India (CSI), Institution of Electronics and Telecommunication Engineers (IETE), Indian Welding Society, Student Nurses Association of India (SNAI), Petrotech Society, and Indian Institute of Chemical Engineers. CII Young Indians, CSI, and IEEE student chapters are nationally recognized with CSI student chapter being adjudged as the best in India among 600 odd colleges and universities for three consecutive years.
- Opportunity for students to demonstrate their social commitment and community engagement. AMRITA students have actively participated in disaster relief and rehabilitation activities after the Gujarat Earthquake in 2001; Tsunami relief operations in Tamil Nadu and Kerala in 2005-2006, flood relief operations in Bihar in 2009 and Raichur in Karnataka in 2010. Since 2010, AMRITA students in all campuses have played an active role in the Amala Bharatham – Clean India awareness drive and campaigns in their communities, as well as wholeheartedly participating in the cleaning of the Sabarimalai pilgrimage site, before and after the pilgrimage season.
- A rich cultural life exists in the university campuses, with celebrations for Indian festivals like Gokulashtami, Guru Purnima, Navarathri, etc., to help students to develop an integrated personality along with soft managerial/leadership skills.
- Directorate of Corporate & Industry Relations (CIR) with centres in all campuses focuses on meeting requirements of students from diverse disciplines for building competencies in domain areas as well as in life skills. CIR focuses on Learning and Development, Corporate Relations, Career Facilitation, Entrepreneurship Development, Alumni Networking, Corporate Communication, and Corporate Training.
- Training programmes for various competitive examinations like GRE, CAT, GATE, and GMAT are facilitated with the help of experts in the respective areas.
- Well planned industry academia collaboration activities are in place, with more than 200+ companies for placements. MoUs have been signed with many well reputed national and international companies covering various aspects related to industry and academia.
- Almost 100% placement has been achieved for B.Tech. and MBA students, for many years, with many of them securing multiple offers as well as overseas placements.

- Industry involvement in student activities has provided several benefits: Tata Consultancy Services (TCS) instituted Ph.D. Research Fellowship Programme, Best Student & Best Project Awards, and Research Assistantship for M.Tech. students from Cisco.
- Promotion of research culture among students by engaging in good quality student projects undertaken at UG/PG level, some of which have led to journal publications.
- Promotion of cultural and sports activities like Talent Search for first year students, Intramural Competitions for all students, Annual Culture Meet, Annual Sports Meet, Inter-Campus Tournaments, Summer and Winter Coaching Camps including Swimming and friendly matches at Intra and Inter Departmental Level in each campus.
- Technology Business Incubator (TBI) for aspiring innovators & entrepreneurs to kick start their ideas.
- Centre for Entrepreneurship (ACE) set up to promote entrepreneurship amongst students.
- Centre for Environmental Studies and Nature Club engaged in tree planting, forest protection, liquid and solid waste management, vermicomposting, medicinal plant cultivation and afforestation activities with active involvement of students. In the Coimbatore campus, by the year 2010 about 1 lakh of trees belonging to 210 species were planted in the campus and the UNEP (United Nations Environmental Programme) issued to the Centre an appreciation certificate for this achievement as a part of the 1 billion tree planting programme. Around 13 lakh litres of waste water released every day from hostels, residences, canteens and other sources are fully recycled through bio-remediation and utilized for horticulture & gardening.
- Various student clubs and organizations focused on social awareness and community engagement like Amrita Sanjeevani, Amrita Prakrithi Samrakshana Samit (Nature club), Green Friends, Amrita Blood Collectors and Donors (ABCD) Forum, Anti-Tobacco Movement at Amrita (ATMA), etc.
- Students are given the opportunity to participate in various medical, dental, and special camps, organized by the university in various locations, as well as in camps at sites of disaster relief and rehabilitation like Tsunami. Annually over 150 camps are being organized.
- Full-time Resident wardens available at all hostels to attend to student needs.

### **Governance, Leadership and Management**

- Chancellor of Amrita Vishwa Vidyapeetham, world renowned humanitarian leader, Sri Mata Amritanandamayi Devi is accessible to anybody and everybody.
- Amrita Vishwa Vidyapeetham is managed by a registered public charitable trust with United Nations recognition, which is involved in multifarious social, cultural, education, disaster relief, healthcare activities all over the world. The Economic and Social Council (ECOSOC) of the United Nations (UN) has given the distinguished Special UN consultative status to

Mata Amritanandamayi Math in 2005. Subsequently in 2008, the UN Department of Public Information (DPI) has awarded associate status to the Mata Amritanandamayi Math to help its work of disseminating information and research into humanitarian issues. Along with its international charitable arm, Embracing the World (ETW), the Math has engaged in disaster relief activities and rehabilitation to the tune of US \$60 million in India, USA, Japan, Sri Lanka, Haiti, Kenya, and other countries, since 2004. US \$70 million has also been provided towards healthcare charity.

- Amrita Vishwa Vidyapeetham has been graded in the 'A' category by the Deemed University Review Committee of Ministry of Human Resource Development. AMRITA is placed in the ivy-league of Indian universities along with Indian Institute of Science, TIFR, NIMHANS, BITS, etc.
- Amrita Vishwa Vidyapeetham was the first self-financing institution to get university status under Section 3 of UGC act within nine years of its inception.
- One unique thing at AMRITA, perhaps not found in any university in the world, is that inspired by AMMA, hundreds of faculty members, doctors and researchers are engaged in selfless service in the university and hospital.
- An in-house academic ERP system, AUMS (Amrita University Management System), has been developed for academic and administrative purposes. Access to student and parent portals of AUMS for ascertaining student's progress and attendance results in increased rapport with stakeholders. AUMS can be accessed through the web with appropriate security safeguards.

AUMS has the following modules:

- Academic Administration system which encompasses admission, timetable, course registration, placement management, hostel management, inventory & purchase management, facilities management, evaluation, grading, certificate generation, finance, budgeting and fee collection.
- E-learning system
- Student relationship management systems
- Library Automation system
- Content Management system
- Alumni Management system
- AUMS has been instrumental in allowing the university to conduct the entire academic administration process with a minimum number of administration and support staff.
- Amrita Centre for International Programmes (ACIP) has been set up and has been immensely successful in meeting its objectives. Its purpose is to support, coordinate, develop, and manage all international initiatives, like student, researcher and faculty exchange, dual degrees, remote teaching, joint academic programmes, co-guidance of Ph.D. students and research scholars, high-end research collaboration and memoranda of understanding with premier universities across the globe.
- Amrita Institute of Medical Sciences Hospital attached to the university is accredited by NABH, NABL and ISO 9001-2008.

- Amritians - Amrita University Alumni Network – has been functioning well to harness professional expertise and experience of alumni to benefit students in the campus with chapters in all campuses.
- Amrita Institute of Medical Sciences (AIMS) has constituted an Institutional Research and Ethics Committee (IRB) and Institutional Animal Ethics Committee in compliance with guidelines of Indian Council of Medical Research (ICMR) and Committee for the Purpose of Control and Supervision of Experiments on Animals (CPCSEA). IRB meets at least once in a month to critically review the research protocols, which are cleared by core committees like Pre-clinical, Para-clinical, Medical, and Surgical specialties.

### **Innovations and Best Practices**

- Huge opportunity for students to get hands-on experience through live-in labs by participating in Amrita Self-Reliant Villages (Amrita SeRVe), an initiative launched during AMMA's 60<sup>th</sup> Birthday celebrations in September, 2013. This is a village adoption program through which the Mata Amritanandamayi Math (MAM) has selected 101 villages throughout India with the goal of helping them establish the required infrastructure to become self-reliant role model villages for the country. With the goal of holistic development, the Amrita SeRVe project will provide assistance to each of the 101 villages in the following focus areas: 1) Infrastructure & Facilities, 2) Healthcare, 3) Energy, 4) Skill-Development, Vocational Training & Sustained Livelihood, 5) Disaster Preparedness, 6) School Education & Adult Literacy, 7) Environmental Protection & Afforestation, 8) Self-Empowerment, 9) Communication & Monitoring.
- Orientation in Yoga, Meditation and Cultural Education is provided to all students. This helps them achieve holistic development of mind and body as well as emotional maturity.
- Variety of remedial options like summer and winter courses, runtime redo courses, contact course, supplementary second-chance examinations, etc. for slow learners to help them clear backlogs, so as to help them avoid losing an academic year of study.
- Research focus is to engage in technologies, projects and solutions for societal and humanitarian relief as also to conceptualize and develop low-cost technologies to solve scientific and societal challenges facing the world. These include issues like sustainable development, water scarcity, sanitation & waste disposal, environmental protection, renewable energy etc.
- Interdisciplinary centres of excellence and research with inter-disciplinary project teams of researchers working on problems like adaptive insulin pump project, which draws researchers from medical, biotechnology & engineering schools and Virtual Labs, which draws researchers from sciences, biotechnology, computer sciences etc. These centres along with departments have attracted funded projects worth Rs. 180 crores in the last ten years. Many of these funded projects have been completed successfully.
- Faculty members are deputed full-time for some of the sponsored projects of national importance.

- Lectures by eminent professors from across the world including Nobel Laureates through A-VIEW benefiting hundreds of colleges and universities all over India.
- Complete automation of all academic and administrative activities using in-house developed academic ERP system, Amrita University Management System (AUMS), which is being continuously upgraded.
- Full-fledged directorate of Corporate & Industry Relations (CIR) with centres in all campuses building life skills for students by focusing on Learning and Development and Career Facilitation. Other activities include Corporate Relations, Entrepreneurship Development, Alumni Networking, Corporate Communication and Corporate Training
- A dynamic team in the Amrita Centre for International Programmes (ACIP) to coordinate various international initiatives:
  - Student, researcher, and faculty exchange
  - Twinning, joint, and dual degree programmes
  - Remote teaching
  - Co-guidance of Ph.D. students and research scholars
  - High-end research collaboration including centres of excellence and research projects
  - Memoranda of Understanding with premier universities across the globe.
- Unique facilities and amenities like production unit of Ayurvedic Medicine attached to the school of Ayurveda.
- Engagement with industry based on Corporate Action Plan, which covers various interaction areas relevant to Industry, Faculty and Students.
- Dream placement option to promote placement of students in core companies.
- Twinning and collaborative programmes with various foreign universities like Vrije University, Netherlands; State University of New York (SUNY), Buffalo; KTH-Royal Institute of Technology, Stockholm; University of New Mexico; Polytechnic University of Catalonia (UPC), Barcelona etc. For the twinning programme with SUNY Buffalo, courses are equally divided among AMRITA and Buffalo faculty. AMRITA awards MBA and SUNY Buffalo offers MS degrees in this collaborative programme.
- Distinguished, Adjunct and Emeritus professors and Faculty members to help research scholars.

### AMRITA WEAKNESSES

- The level of research activities and funded projects in various schools like arts & sciences, education, dental, nursing and pharmacy needs to be increased.
- Need for expansion of on-campus accommodation for faculty members in Bangalore, Mysore, and Amritapuri campuses.
- Lack of significant engagement with Amrita alumni to involve them in various activities of the university.
- Inadequate level of Executive Development Programmes (EDP) and Management Development Programmes (MDP) for industry.
- PG programmes in some disciplines, like education are yet to be offered.

### OPPORTUNITIES FOR AMRITA

- Some of the futuristic research & development challenges posed by the Chancellor of Amrita Vishwa Vidyapeetham include projects with wide-ranging societal, humanitarian application and benefit. These are excellent opportunities for multi-disciplinary research teams drawn from various schools of the university to work on. Some of these include development of low-cost sanitary napkins, nano medicine applications, mobile applications for health care monitoring, Alternative energy sources into miniaturized components for use in rural areas, nanostructured low cost materials for water purification and sensors to test the quality of the water, Robotics and Haptics technology for surgical assistance, medical simulation and training etc.
- AMRITA has active tie-ups and collaborations with over 75 universities in USA, Europe, Australia, Japan, etc., for joint research, collaborative centres of excellence, cross-continental projects, faculty, student and researcher exchange. There is a huge opportunity to leverage these collaborations and linkages. For example, give every student of AMRITA an international experience; Joint Ph.D. programmes, cross-continental centres of excellence, etc.
- Competition with a large number of international universities as well as institutions of national importance being set up in India will automatically force Indian universities to raise its standards to international levels. It may also bring in new focus on innovation.
- There is immense opportunity to have more diversity in the student community; university could try to attract more students from northern and north-eastern parts of India through appropriate advertising and awareness about the programmes.
- Government of India is taking big steps towards promoting skill development and research focusing on low literacy populations on which the research centre, AMMACHI Labs can capitalize based on ongoing projects. Huge opportunity considering the need for 2000 plus vocational courses and 500 million plus people waiting to get trained in India.
- Every year, around 50 international medical students from various universities in the world such as University College London Medical School, MEI University School of Medicine Japan, University of Cologne, Pavol Jozef Safarik University in Kosice Slovak Repub, Medical School of University Autonoma de Barcelona, University of Oxford UK, RUHR University of Bochum Germany, University of Bonn Germany, University of Nottingham UK, Des Moines University - Iowa, New York University School of Medicine, etc., visit our university for short term training. These numbers could be expanded as also we could attract more foreign students in other disciplines like engineering, biotechnology, etc.
- The large databank of alumni, can be leveraged for multiple purposes like student mentoring, student development programmes, corporate relations, etc.
- Establishment of chair professorships by industries.
- Attain leadership in environmental studies and sustainability area leveraging existing environmental initiatives. Future plans include

M.Tech. programme on sustainability, and carrying out a number of educational activities including the development of an Interpretation Centre on Western Ghats Biodiversity, teaching laboratories, a demonstration Ecohouse, and conducting public awareness campaigns.

### **CHALLENGES FOR AMRITA**

- Commoditization of education in many disciplines like engineering and management, across the country and globe, will create bigger challenges for the university in the long term. We will need to have continual sustained efforts to distinguish our programmes.
- Competition with new higher educational institutions like IIMs, IITs, and IISERs being set up in the governmental sector for faculty members and student selection.
- Advent of foreign universities starting campuses in India, coupled with a nationwide shortage of high quality and experienced faculty.
- Government regulations, resulting in lack of autonomy for deemed universities to function.
- Market conditions and global recession along with poor economic growth.
- Over - riding short term (job seeking) goals of parents and students, limit the commitment of the students for undertaking rigorous academic and scholarly pursuits.
- The university needs to build more middle level faculty members with sufficient teaching, research, and administrative experience, who can take over responsibilities when the senior faculty members retire.
- Lack of private industry participation in various research, developmental and extension initiatives of the university.
- Increased lead time in securing grants from governmental agencies for various research projects, initiatives and centres. Differential treatment in fund disbursement to self-financing deemed universities.
- Even though there is a concerted effort to promote placement of students in core engineering companies, number of vacancies in manufacturing companies like L&T, Caterpillar, etc., are only a fraction of the vacancies in IT companies like Infosys, Cognizant, etc. Salaries offered by manufacturing companies are significantly lower than those offered by IT companies.
- Expansion of consultancy assignments hampered due to new service tax structure and rules of the Government of India.
- Attracting large numbers of international students to the university.
- Nationwide dearth of adequate talented candidates who are interested in the pursuit of Ph.D. and post-doctoral research.
- Attracting talented students for degree programmes in humanities and basic sciences – societal bias towards professional programmes.
- Inspiring students to look at education as a lifelong process, and shaping their conduct accordingly.
- Inspiring students & parents to undertake and accept the increased academic rigor and higher standards so as to prepare them for more challenging careers in the industry and R&D organizations
- Attracting public sector companies to come for campus recruitment.

# Profile of Amrita University

## B. Profile of the University

### 1. Name and Address of the University:

Name:	<b>Amrita Vishwa Vidyapeetham,</b> Amritanagar PO	
Address:		
City: Coimbatore	Pin: 641112	State: Tamil Nadu
Website: www.amrita.edu		

### 2. For communication:

Designation	Name	Telephone with STD code	Mobile	Fax	Email
<b>Vice-Chancellor</b>	Dr. P. Venkat Rangan	O: (0422) 2685888 R: (0422) 2685280	9488 2377 77	(0422) 265221 Telefax	venkat@amrita.edu
<b>Pro-Chancellor</b>	Brahmachari Abhayamrita Chaitanya	O: (0422) 2685101 R: (0422) 2656353	9443 2177 77	(0422) 265221 Telefax	abhayamrita@amrita.edu
<b>Registrar</b>	Dr. S. Krishnamoorthy	O: (0422) 2685110 R: (0422) 2604473	9443 3844 73	(0422) 265221 Telefax	sk@amrita.edu
<b>Steering Committee / IQAC Coordinator</b>	Dr. Sriram Devanathan	O: (0422) 2685554 R: (0422) 2652145	9943 9844 98	(0422) 26562 74	sriram@amrita.edu
<b>Steering Committee / IQAC Co-Coordinator</b>	Prof. Prashant R. Nair	O: (0422) 2685701 R: (0422) 2685284	9943 9844 83	(0422) 26562 74	prashant@amrita.edu

3. Status of the University:

State University	<input type="checkbox"/>
State Private University	<input type="checkbox"/>
Central University	<input type="checkbox"/>
University under Section 3 of UGC (Deemed University)	<input checked="" type="checkbox"/>
Institution of National Importance	<input type="checkbox"/>
Any other (please specify)	<input type="text"/>

4. Type of University:

Unitary	<input checked="" type="checkbox"/>
Affiliating	<input type="checkbox"/>

5. Source of funding:

Central Government	<input type="checkbox"/>
State Government	<input type="checkbox"/>
Self-financing	<input checked="" type="checkbox"/>
Any other (please specify)	<input type="text"/>

6. a. Date of establishment of the university: ...13/01/2003... (dd/mm/yyyy)

b. Prior to the establishment of the university, was it a/an

- i. PG Centre Yes  No
- ii. Affiliated College Yes  No
- iii. Constituent College Yes  No
- iv. Autonomous College Yes  No
- v. Any other (please specify) .....

If yes, give the date of establishment ...27/10/1994... (dd/mm/yyyy)

7. Date of recognition as a university by UGC or any other national agency:

Under Section	dd	mm	yyyy	Remarks
i. 2f of UGC*				
ii. 12B of UGC *				
iii. 3 of UGC #	13	01	2003	
iv. Any other ^ (specify)				

\* Enclose certificate of recognition.

# Enclose notification of MHRD and UGC for all courses / programmes / campus/campuses.

^ Enclose certificate of recognition by any other national agency/agencies, if any.

**REFER TO ATTACHMENTS AT THE END OF THIS SECTION  
(UNIVERSITY PROFILE)**

8. Has the university been recognized

a. By UGC as a University with Potential for Excellence?

Yes  No

If yes, date of recognition : ..... (dd/mm/yyyy)

b. For its performance by any other governmental agency?

Yes  No

If yes, Name of the agency

Ministry of Human Resource Development (MHRD) Review of Deemed Universities (Tandon Committee report)

and, date of recognition: ...19/10/2009

9. Does the university have off-campus centres?

Yes  No

If yes, date of establishment : ..... (dd/mm/yyyy)

date of recognition : ..... (dd/mm/yyyy)

Kochi Campus	January 2003 during conferring of deemed university status
Bangalore campus	June 2004
Mysore campus	September 2006
Amritapuri (Kollam) campus	August 2003

#### AMRITA VISHWA VIDYAPEETHAM TIMELINE

2002	Inspection by UGC Team for the award of Deemed University status	
Jan, 2003	<p><b>Deemed University Status Awarded</b> by MHRD to the following constituent colleges run by Mata Amritanandamayi Math</p> <ul style="list-style-type: none"> <li>• Amrita Institute of Technology and Science, Ettimadai Campus, Coimbatore, Tamilnadu</li> <li>• Amrita Institute of Management Ettimadai Campus, Coimbatore, Tamilnadu</li> <li>• Amrita School of Medical Sciences and Research, Kochi Campus</li> <li>• Amrita Institute of Pharmaceutical Sciences, Kochi Campus, Kerala and</li> <li>• Amrita Institute of Nursing Sciences, Kochi Campus, Kerala</li> </ul>	<p><b>AMRITA VISHWA VIDYAPEETHAM</b> (Deemed University established under section 3 of the UGC Act, 1956, vide notification No. F-9-25/2000-u.3 dt. January 13, 2003 of Government of India, Ministry of HRD, Department of Secondary and Higher Education)</p>
	<p><b>Inclusion of the Institution run by Mata Amritanandamayi Math under the ambit of Amrita Vishwa Vidyapeetham</b></p>	<p><b>Month &amp; Year</b></p>
2003	Amrita Institute of Computer Technology, Amritapuri, Kollam, Kerala	Aug 2003

<b>Name of the New Institutions Established under the ambit of Amrita Vishwa Vidyapeetham</b>		<b>Month &amp; Year</b>
2004	Amrita College of Dentistry, Kochi Campus, Kerala, Approved by DCI	July 2004
2004	Amrita Ayurvedic Medical College, Amritapuri Campus, Kollam, Kerala	Sep 2004
<b>Inclusions of the Institutions run by Mata Amritanandamayi Math under the ambit of Amrita Vishwa Vidyapeetham.</b>		
June 2004	Amrita Institute of Technology and Sciences, Bangalore Campus, Karnataka	
June 2004	Amrita Institute of Technology and Sciences, Amritapuri Campus, Kollam, Kerala	
<b>Inclusions of the Institutions run by Mata Amritanandamayi Math under the ambit of Amrita Vishwa Vidyapeetham with a change of Name</b>		
Sep 2006	Amrita Institute of Computer Technology, Amritapuri Campus, Kollam, Kerala	Amrita School of Applied Sciences, Amritapuri Campus, Kollam, Kerala
Sep 2006	Amrita Mahavidyala – Mysore Campus, Karnataka, Affiliated to University of Mysore, Mysore, Karnataka.	<b>Amrita School of Arts and Science, Mysore Campus, Karnataka</b>
Sep 2006	Amrita Shikshana Mahavidyalaya, Affiliated to University of Mysore Campus, Mysore, Karnataka	<b>Amrita School of Education, Mysore Campus, Karnataka</b>
	<b>Name of the new Institutions Established under the ambit of Amrita Vishwa Vidyapeetham</b>	<b>Month &amp; Year</b>
2007	<b>Amrita School of Biotechnology, Amritapuri Campus, Kollam, Kerala</b>	June 2007
2007	<b>Amrita School of Arts and Sciences, Kochi Campus, Kerala.</b>	June 2007
<b>Change in the Nomenclature of the Constituent Schools of Amrita Vishwa Vidyapeetham</b>		
<b>Year</b>	<b>Existing Name</b>	<b>Approved New Name</b>
July 2005	Amrita Institute of Nursing Sciences, Kochi Campus, Kerala	<b>Amrita College of Nursing, Kochi Campus, Kerala</b>
June 2006	Amrita Ayurvedic Medical College, Amritapuri Campus, Kollam, Kerala	<b>Amrita School of Ayurveda, Amritapuri Campus, Kollam, Kerala</b>
June 2006	Amrita College of Dentistry, Kochi Campus, Kerala	<b>Amrita School of Dentistry, Kochi Campus, Kerala</b>
June 2006	Amrita Institute of Technology and Science, Ettimadai Campus, Tamilnadu	<b>Amrita School of Engineering, Ettimadai Campus, Coimbatore</b>
June 2006	Amrita Institute of Management, Ettimadai Campus, Tamilnadu	<b>Amrita School of Business, Ettimadai</b>

		<b>Campus, Coimbatore</b>
June 2006	Amrita School of Medical Sciences and Research, Kochi Campus, Kerala	<b>Amrita School of Medicine, Kochi Campus, Kerala</b>
June 2006	Amrita Institute of Pharmaceutical Sciences, Kochi Campus, Kerala	<b>Amrita School of Pharmacy, Kochi Campus, Kerala</b>
Sep 2006	Amrita Institute of Technology and Science, Amritapuri Campus, Kollam, Kerala	<b>Amrita School of Engineering, Amritapuri Campus, Kollam, Kerala</b>
Sep 2006	Amrita Institute of Technology and Science, Bangalore Campus, Karnataka.	<b>Amrita School of Engineering, Bangalore Campus, Karnataka</b>
Dec 2006	Amrita School of Applied Sciences, Amritapuri, Kollam, Kerala	<b>Amrita School of Arts and Sciences, Amritapuri, Kollam, Kerala</b>
<b>New Constituent units</b>		
2007	<b>Amrita Centre for Nanobiosciences, Kochi</b>	
2009	<b>Department of Management, Amritapuri</b>	
2009	<b>Department of Management, Bangalore</b>	
2009	<b>Department of Management, Kochi</b>	

10. Does the university have off-shore campuses?

Yes  No

If yes, date of establishment : ..... (dd/mm/yyyy)

date of recognition : ..... (dd/mm/yyyy)

11. Location of the campus and area:

	Campus	Land Area (Acres)		Built-up Area (sq. m)	
i.	University Headquarters (Ettimadai, Coimbatore)	Amrita School of Engineering, Coimbatore	338.5	Amrita School of Engineering, Coimbatore	1,99,213
		Amrita School of Business, Coimbatore	14.96	Amrita School of Business, Coimbatore	6,560.16
		Total	338.5	Total	2,05,773
ii	Satellite campus I area (Amritapuri, Kollam)	Amrita School of Engineering, Amritapuri	48.27	Amrita School of Engineering, Amritapuri	1,02,027.00

		Amrita School of Arts and Sciences, Amritapuri		Amrita School of Arts and Sciences, Amritapuri	
		Amrita School of Biotechnology, Amritapuri		Amrita School of Biotechnology, Amritapuri	4,960.00
		Amrita School of Ayurveda, Amritapuri	25.00	Amrita School of Ayurveda, Amritapuri	16,393.00
		Total	59.41	Total	88,915.60
iii	Satellite campus II area (Kochi)	Amrita School of Medicine, Kochi		Amrita School of Medicine, Kochi	92,019.00
		Amrita School of Dentistry, Kochi		Amrita School of Dentistry, Kochi	14,312.27
		Amrita College of Nursing, Kochi	93.32	Amrita College of Nursing, Kochi	6587.65
		Amrita School of Pharmacy, Kochi		Amrita School of Pharmacy, Kochi	6,802.00
		Amrita School of Arts & Sciences, Kochi	3.32	Amrita School of Arts & Sciences, Kochi	8,645.14
		Total	93.32	Total	2,24,062
iv.	Satellite campus III area (Bangalore)	Amrita School of Engineering, Bangalore	44.80	Amrita School of Engineering, Bangalore	1,13,874.23
		Department of Management, Bangalore		Department of Management, Bangalore	
v.	Satellite campus IV area (Mysore)	Amrita School of Arts and Sciences. Mysore	5.00	Amrita School of Arts and Sciences. Mysore	3,396.57
		Amrita School of Education, Mysore		Amrita School of Education, Mysore	3,026.20
	TOTAL		5.00		6,504.83
	GRAND TOTAL		534.48		5,72,654

NOTE: The Kochi & Bangalore campuses are in urban areas, and the

remaining campuses in rural areas.

12. Provide information on the following: In case of multi-campus University, please provide campus-wise information.

- Auditorium/seminar complex with infrastructural facilities
- Sports facilities
  - \* playground
  - \* swimming pool
  - \* gymnasium
  - \* Any other (please specify)
- Hostel
  - \* Boys' hostel
    - i. Number of hostels
    - ii. Number of inmates
    - iii. Facilities
  - \* Girls' hostel
    - i. Number of hostels
    - ii. Number of inmates
    - iii. Facilities
  - \* Working women's hostel
    - i. Number of hostels
    - ii. Number of inmates
    - iii. Facilities
- Residential facilities for faculty and non-teaching
- Cafeteria
- Health centre – Nature of facilities available – inpatient, outpatient, ambulance, emergency care facility, etc.
- Facilities like banking, post office, book shops, etc.
- Transport facilities to cater to the needs of the students and staff
- Facilities for persons with disabilities
- Animal house
- Incinerator for laboratories
- Power house
- Waste management facility

**NOTE:** Amrita University provides all these facilities in a comprehensive way. Due to the vast and complex nature of the university set up, the data is bulky and is not included here, for brevity. As per the guidelines provided in the NAAC manual this data is included in the individual “Evaluative Report of the Department” – this is being provided at the level of each constituent school and university department of the university.

**NOTE:** Items 13, 14, and 15 b, c, d, e, f, g, h, i, j, and k are omitted as per instructions given in NAAC Manual, as Amrita Vishwa Vidyapeetham is a unitary university.

15. Furnish the following information:

Particulars	Number	Number of Students
a. University Departments		
Undergraduate	30	
Post graduate	122	
Research centres on the campus		

16. Does the university conform to the specification of Degrees as enlisted by the UGC? Yes  No   
If the university uses any other nomenclatures, please specify.

17. Academic programmes offered by the university departments at present, under the following categories: (Enclose the list of academic programmes offered)

ACADEMIC UNIT	Number of Programmes						
	UG	PG	Integrat ed Masters	M. Phil	Certificate	Dipl oma	PG Diplo ma
Amrita School of Arts & Sciences, Kochi	4	5	1				
Amrita School of Arts & Sciences, Mysore	3	3					
Amrita School of Ayurveda, Amritapuri	1						
Amrita School of Business, Coimbatore		1					
Amrita School of Biotechnolog y, Amritapuri	2	3					
Amrita School of Engineering, Bangalore	5	5					

Amrita Department of Management, Amritapuri		1					
Amrita Department of Management, Bangalore		2					
Amrita College of Nursing, Kochi	2	1					
Amrita School of Pharmacy, Kochi	1	5					
Amrita School of Engineering, Amritapuri	5	10			1		
Amrita School of Arts & Sciences, Amritapuri	2	5	3				
Amrita School of Engineering, Coimbatore	8	15	4				2
Amrita Department of Management, Kochi		1					
Amrita School of Medicine, Kochi	14	60		1			15
Amrita School of Dentistry, Kochi	1	9				1	
Amrita School of Education, Mysore	1						
Amrita Department of Communication, Coimbatore	1	2					1
Total	50	128	8	1	1	1	18

Note: The same degree programme may be offered on more than one campuses, in many cases.

**Ph.D. in the following areas:**

1. Engineering, Arts & Sciences
2. Humanities
3. Commerce and Management
4. Health Sciences

**18. Number of working days during the last academic year.**

<b>School Name</b>	<b>Number of Working days during the last academic year</b>
Amrita School of Arts and Sciences, Kochi	170
Amrita School of Arts and Sciences, Mysore	206
Amrita School of Biotechnology, Amritapuri	260
Amrita School of Engineering, Bangalore	271
Amrita Department of Management, Amritapuri	215
Amrita Department of Management, Bangalore	226
Amrita College of Nursing, Kochi	290
Amrita School of Pharmacy, Kochi	220
Amrita School of Engineering, Amritapuri	165
Amrita School of Arts and Sciences, Amritapuri	162
Amrita School of Engineering, Coimbatore	216
Amrita Department of Management, Kochi	229
Amrita School of Medicine, Kochi	305
Amrita School of Dentistry, Kochi	285
Amrita School of Education, Mysore	225
Amrita School of Ayurveda, Amritapuri	220

**19. Number of teaching days during the past four academic years.**

<b>School Name</b>	<b>Number of Teaching days during the past four academic years (Total)</b>
Amrita School of Arts and Sciences, Kochi	648

Amrita School of Arts and Sciences, Mysore	732
Amrita School of Biotechnology, Amritapuri	698
Amrita Department of Management, Amritapuri	728
Amrita School of Engineering, Bangalore	759
Amrita Department of Management, Bangalore	904
Amrita College of Nursing, Kochi	920
Amrita School of Pharmacy, Kochi	880
Amrita School of Engineering, Amritapuri	626
Amrita School of Arts and Sciences, Amritapuri	600
Amrita School of Engineering, Coimbatore	740
Amrita Department of Management, Kochi	904
Amrita School of Medicine, Kochi	1200
Amrita School of Dentistry, Kochi	1080
Amrita School of Education, Mysore	600
Amrita School of Ayurveda, Amritapuri	868

20. Does the university have a department of Teacher Education?

Yes  No

If yes,

- Year of establishment .....Nov 2004... (dd/mm/yyyy)
- NCTE recognition details (if applicable)  
Notification No.: .....F.SRO/NCTE/B.Ed/2004-  
2005/8832.....  
Date: ...30/11/2004..... (dd/mm/yyyy)
- Is the department opting for assessment and accreditation separately?  
Yes  No

21. Does the university have a teaching department of Physical Education?

Yes  No

If yes,

- Year of establishment ..... (dd/mm/yyyy)
- NCTE recognition details (if applicable)  
Notification No.: .....

Date: ..... (dd/mm/yyyy)

- c. Is the department opting for assessment and accreditation separately?  
Yes  No

22. In the case of Private and Deemed Universities, please indicate whether professional programmes are being offered?

Yes  No

If yes, please enclose approval / recognition details issued by the statutory body governing the programme.

#### **REFER ANNEXURE 1**

23. Has the university been reviewed by any regulatory authority? If so, furnish a copy of the report and action taken there upon.

#### **AMRITA SCHOOL OF ARTS AND SCIENCES, MYSORE**

UGC Inspection in 2009 – observations and findings are sent to the University.

#### **AMRITA SCHOOL OF BIOTECHNOLOGY, AMRITAPURI**

- DBT – review of Bio safety  
The Institutional Biosafety Committee (IBSC) which comprises four senior faculty from the School of Biotechnology, three external experts including a medical doctor, and a nominee of the Department of Biotechnology, Government of India (currently Dr. Satish Mundayoor), Rajiv Gandhi Centre for Biotechnology is a mandatory requirement of the Department of Biotechnology, Govt. of India for all institutions carrying out research with recombinant DNA. The IBSC has to meet twice a year, review research protocols and procedures and submit a report of the activities of the school twice a year. There is also a mandatory requirement for these reports to be uploaded to the DBT website.
- BARC  
The school applied for, was reviewed and has been approved for the use of radioactive isotopes in biological research by the department of atomic energy, Government of India. Currently the school has approval for use of radio isotopes including  $^{14}\text{C}$ ,  $^{32}\text{P}$ ,  $^3\text{H}$  radio isotopes.

#### **AMRITA COLLEGE OF NURSING, KOCHI**

Yes, Kerala Nurses and Midwives Council (KNMC); the report is yet to be received.

#### **AMRITA SCHOOL PHARMACY, KOCHI**

Yes

#### **AMRITA SCHOOL OF ENGINEERING, AMRITAPURI**

UGC Expert committee reviewed the deemed university status on 23 rd January 2009.

AICTE experts also approved the deemed status on the same date.

AICTE expert committee visited on 22nd February 2011.

**AMRITA SCHOOL OF ARTS & SCIENCES, AMRITAPURI**

UGC expert Committee visited the Campus on 23 Jan 2009 reviewed the Deemed Status of the University.

**AMRITA SCHOOL OF MEDICINE, KOCHI**

Yes; by the Medical Council of India every five years (re-recognition for another five years received in 2013).

**AMRITA SCHOOL OF DENTISTRY, KOCHI**

Yes. Dental Council of India.

24. Number of positions in the university

Positions	Teaching faculty			Non-teaching staff	Technical staff
	Professor	Associate Professor	Assistant Professor		
Sanctioned by the UGC / University / State Government <i>Recruited Yet to recruit</i>	276	165	1257*	1387	2261
Number of persons working on contract basis	6	0	11	16	2

*\*Includes teaching faculty with designations of "Faculty Associate", "Lecturer", and "Tutor" (Medical School).*

Positions	Teaching faculty			Non-teaching staff	Technical staff
	Professor	Associate Professor	Assistant Professor/ Lecturer/ Faculty Associate		
Amrita School of Arts & Sciences, Kochi	9	0	46	30	7
Amrita School	3	0	40	19	8

<b>Positions</b>	<b>Teaching faculty</b>			<b>Non-</b>	<b>Technical</b>
of Arts & Sciences, Mysore					
Amrita School of Arts & Sciences, Amritapuri	12	3	25	217	114
Amrita School of Engineering, Bangalore	12	7	127	55	22
Amrita School of Engineering, Amritapuri	12	6	103	217	136
Amrita School of Engineering, Coimbatore	42	28	282	55	22
Amrita School of Education, Mysore	1	0	8	1	1
Amrita School of Biotechnology, Amritapuri	2	4	21	7	5
Amrita School of Medicine, Kochi	125	70	512	877	2048
Amrita School of Ayurveda, Amritapuri	21	18	21	45	7
Amrita College of Nursing, Kochi	7	1	32	13	
Amrita School of Pharmacy, Kochi	2		30	6	11
Amrita School of Dentistry, Kochi	19	14	10	42	12
Department of Management, Bangalore	0	1	3	2	1
Amrita School of Business, Coimbatore	5	6	6	8	5
Department of Management, Amritapuri	1	0	7	7	1

<b>Positions</b>	<b>Teaching faculty</b>			<b>Non-</b>	<b>Technical</b>
Department of Management, Kochi	0	1	4	6	1

25. Qualifications of the teaching staff

<b>Highest qualification</b>	<b>Professor</b>		<b>Associate Professor</b>		<b>Assistant Professor/ Lecturer / Faculty Associate/ Tutor</b>		<b>Total</b>
	Male	Female	Male	Female	Male	Female	
<b>Permanent teachers</b>							
D.Sc./D.Litt.	2	0	0	0	0	0	2
Ph.D.	64	21	33	21	55	50	246
M.Phil.	2	0	1	1	0	2	6
PG	138	46	67	41	356	369	1017
UG	0	0	0	0	227	158	385
<b>Temporary teachers</b>							
Ph.D.						3	3
M.Phil.				1		1	2
PG					18	10	28
UG							0
<b>Part-time teachers</b>							
Ph.D.	4				4		8
M.Phil.						1	1
PG					7	4	11
UG							0

**Total = 1707 teaching faculty**

26. Emeritus, Adjunct and Visiting Professors.

	<b>Emeritus</b>	<b>Adjunct</b>	<b>Visiting</b>
Number	1	25	60

27. Chairs instituted by the university:

None

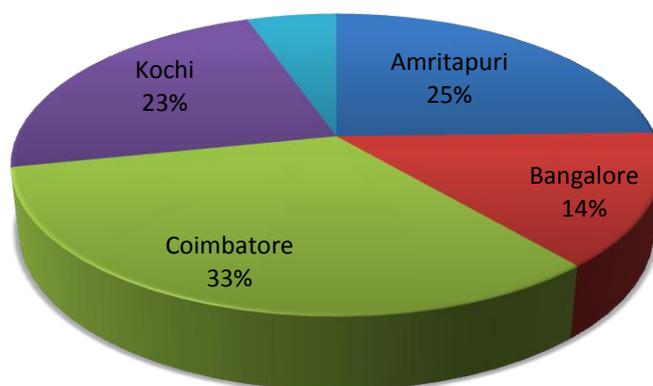
28. Students enrolled in the university departments during the current academic year, with the following details:

<b>Sl. No.</b>	<b>SCHOOL</b>	<b>ENROLMENT</b>	<b>CAMPUS TOTAL</b>
----------------	---------------	------------------	---------------------

<b>COIMBATORE CAMPUS</b>			
1	Amrita School of Engineering, Coimbatore	5291	<b>5681</b>
2	Dept. of Communication, Coimbatore	115	
3	Dept. of Social Work, Coimbatore	36	
4	Amrita School of Business, Coimbatore	239	
<b>AMRITAPURI CAMPUS</b>			
5	Amrita School of Engineering	2606	<b>4247</b>
6	Amrita School of Arts & Sciences	830	
7	Amrita School of Biotechnology	385	
8	Amrita School of Ayurveda	297	
9	Dept. of Management	129	
<b>BANGALORE CAMPUS</b>			
10	Amrita School of Engineering	2354	<b>2451</b>
11	Dept. of Management	97	
<b>KOCHI CAMPUS</b>			
12	Amrita School of Medicine	1339	<b>3953</b>
13	Amrita College of Nursing	370	
14	Amrita School of Pharmacy	399	
15	Amrita School of Dentistry	414	
16	Amrita School of Arts & Sciences	1158	
17	Center for Nano Sciences	143	
18	Dept. of Management, Kochi	130	

MYSORE CAMPUS			
19	Amrita School of Arts & Sciences, Mysore	835	<b>921</b>
20	Amrita School of Education, Mysore	86	
TOTAL.....		<b>17253</b>	

Mysore 5% **Number of Students**



### AMRITA SCHOOL OF ARTS AND SCIENCES, KOCHI

Students	UG	PG	Integ rated Mast ers	M. Phil	Ph. D.	Integ rated Ph.D	D. Litt./ D.Sc	Certif icate	Dipl oma	PG Dipl oma
	*M/ *F	*M /*F	*M /*F	*M /*F	* M /*F	*M /*F	*M/ *F	*M/ *F	*M/ *F	*M /*F
From the state where the university is located	775 (F)	256 (F) and 73 (M)								
From other states of India	19 (F)	3 (F) 1 (M)								
NRI students	12 (F)									

Foreign students	1 (F)									
Total	<b>807</b>	<b>333</b>								

\*M-Male \*F-Female

### AMRITA SCHOOL OF ARTS AND SCIENCES, MYSORE

Students	UG	PG	Integrated Masters	M. Phil	Ph. D.	Integrated Ph.D	D. Litt/ D.Sc	Certificate	Diploma	PG Diploma
	*M/*F	*M/*F	*M/*F	*M/*F	M/*F	*M/*F	*M/*F	*M/*F	*M/*F	*M/*F
From the state where the university is located	145 (M) 101 (F)	58 (M) 89 (F)								
From other states of India	241 (M) 94 (F)	56 (M) 49 (F)								
NRI students	Nil	Nil								
Foreign students										
Total	581	252								

### AMRITA SCHOOL OF AYURVEDA, AMRITAPURI

Type of Student	UG	Total
	Professional	
Students from the same State where the university is located	M-6 F-53	59
Students from other States of India	M-1	1
NRI students	0	0
Foreign students	0	0
Grand Total	60	60

### AMRITA SCHOOL OF BUSINESS, COIMBATORE

Type of Student	UG		PG		Total
	Professional	Non-Professional	Professional (Engg.)	Non-Professional	
Students from the same State where the university is located	N.A.		29	15	44

Students from other States of India		42	15	57
NRI students				
Foreign students				
Grand Total		71	30	101

### AMRITA SCHOOL OF BIOTECHNOLOGY, AMRITAPURI

Students	UG	PG	Integ rated Mast ers	M. Phil	Ph. D.	Integ rated Ph.D	D.Li tt./ D.Sc	Certi ficat e	Dipl oma	PG Dipl oma
	*M/ *F	*M /*F	*M /*F	*M /*F	M /*F	*M /*F	*M/ *F	*M/ *F	*M/ *F	*M /*F
From the state where the university is located	46/ 165	20/ 108								
From other states of India	2/ 13	1/9								
NRI students	0/2									
Foreign students										
Total	48/ 180	21/ 117								

### AMRITA SCHOOL OF ENGINEERING, BANGALORE

Student s	UG	PG	Integ rated Mast ers	M. Phi l.	Ph. D.	Integ rated Ph.D	D.Li tt./ D.Sc	Certi ficat e	Dipl oma	PG Dipl oma
	*M/ *F	*M /*F	*M /*F	* M /*F	* M /*F	*M /*F	*M/ *F	*M/ *F	*M/ *F	*M /*F
From the state where the university is located	M-288 F-188	M-3 F-28			M-10 F-4					

From other states of India	M-1156 F-385	M-43 F-69			M-7 F-14					
NRI students	M-22 F-9	-			-					
Foreign students	-	-			-					
Total	M-1466 F-582 T-2048	M-46 F-97 T-143			M-17 F-18 T-25					

### AMRITA SCHOOL OF BUSINESS, AMRITAPURI

Students	UG	PG	Integr ated Maste rs	M.P hil.	Ph. D.	Integ rated Ph.D	D.Li tt./ D.Sc	Certi ficat e	Di plo ma	PG Dipl oma
	M/ *F	*M /*F	*M /*F	*M /*F	M /*F	*M /*F	*M/ *F	*M/ *F	M/ *F	*M /*F
From the state where the university is located		41/ 58								
From other states of India		23/ 3								
NRI students										
Foreign students										
Total		125								

### DEPARTMENT OF MANAGEMENT, BANGALORE

Students	UG	PG	EMBA
	*M/ *F	*M /*F	*M /*F
From the state where the university is located		1/0	0
From other states of India		32/17	25/3
NRI students		0	0
Foreign students		0	0

Students	UG	PG	EMBA
	*M/*F	*M/*F	*M/*F
Total		50	28

### AMRITA COLLEGE OF NURSING, KOCHI

Students	UG	PG	Integr ated Maste rs	M.P hil.	Ph. D.	Integ rated Ph.D	D.L itt./ D.S c.	Cer tifi cate	Di plo ma	PG Dipl oma
	*M/ *F	M /*F	*M /*F	*M /*F	M /*F	*M /*F	*M/ *F	*M/ *F	M/ *F	*M /*F
From the state where the university is located										
From other states of India	3/ 42	4/ 29								
NRI students	1/1									
Foreign students										
Total	4/ 43	4/ 29								

### AMRITA SCHOOL PHARMACY, KOCHI

Students	UG	PG	Integ rated Mast ers	M.P hil.	Ph. D.	Integ rated Ph.D	D.Lit t./ D.Sc	Cer tifi cate	Di plo ma	PG Dipl oma
	*M/ *F	*M /*F	*M /*F	*M /*F	M /*F	*M /*F	*M/ *F	*M/ *F	M/ *F	*M /*F
From the state where the university is located	56/ 179	21/ 121								
From other states of India	0/3									
NRI students		1/2								
Foreign students	-	-								
Total	56/ 182	22/ 123								

### AMRITA SCHOOL OF ENGINEERING, AMRITAPURI

Students	UG	PG	Integ rated Mast ers	M.P hil.	Ph. D.	Integ rated Ph.D	D.Li tt./ D.Sc	Cert ific ate	Di plo ma	PG Dip lo ma
	M/ *F	M /*F	*M /*F	*M /*F	M /*F	*M /*F	*M/ *F	*M/ *F	M/ *F	*M /*F
From the state where the university is located	M-245 F-125	M-69 F-158			44					
From other states of India	M-142 F-18	M-5 F-1			15					
NRI students	M-5 F-3									
Foreign students					2					
Total										

#### AMRITA SCHOOL OF ARTS & SCIENCES, AMRITAPURI

Students	UG	PG	Integ rated Mast ers	M. Phi l.	Ph. D.	Integr ated Ph.D.	D.Li tt./ D.Sc	Certif icate	Dipl oma	PG Dipl oma
	*M/ *F	M /*F	*M /*F	M /*F	M /*F	*M /*F	*M/ *F	*M/ *F	*M/ *F	*M /*F
From the state where the university is located	222 / 127	40/ 99	81/ 170		9/ 24					
From other states of India	6/2	2/0	2/1		1/1					
NRI students	23/ 15	2/0	1/0							
Foreign students	1/0									
Total	252 / 144	44/ 51	84/ 171							

#### AMRITA SCHOOL OF ENGINEERING, COIMBATORE

Number of students enrolled in the School during the current year	
---	--

(2012-2013), with the following details:						
<b>UG</b>						
Enrollment	Professional				Non-Professional	Total
	Type of Student					
	Students from the same State where the university is located	Students from other State of India	NRI Students	Overseas Students		
<b>B.Tech</b>						
2012-2013	680	296	37	1		1014
2011-2012	667	328	57	0		1052
2010-2011	768	388	52	0		1208
2009-2010	595	362	60	0		1017
Total	2710	1374	206	1		4291
<b>BA Comm.</b>						
2012-2013	6	22	1	0		29
2011-2012	9	15	1	0		25
2010-2011	10	11	1	0		22
Total	25	48	3	0		76
<b>PG</b>						
Enrollment	Professional				Non-Professional	Total
	Type of Student					
	Students from the same State where the university is located	Students from other State of India	NRI Students	Overseas Students		
<b>M.Tech</b>						
2012-2013	101	179	0	0		280
2011-2012	68	175	0	0		243
Total	169	354	0	0		523
<b>MCA</b>						
2012-2013	10	12	0	0		22
2011-	36	21	0	0		57

2012						
2010-2011	32	27	2	0		61
Total	78	60	2	0		140
<b>MSW</b>						
2012-2013	3	15	0	0		18
2011-2012	4	12	0	0		16
Total	7	27	0	0		34
<b>MA Comm.</b>						
2012-2013	2	1	0	0		3
2011-2012	6	8	1	0		15
Total	8	9	1	0		18
<b>PGDJ</b>						
2012-2013	1	0	0	0		1
<b>PG Diploma</b>						
2012-2013	11	18	0	0		29
<b>Ph.D</b>						
2012-2013	14	19				33
2011-2012	14	14				28
Total	28	33				61

#### **DEPARTMENT OF MANAGEMENT, KOCHI**

Students	UG	PG
	*M/ *F	*M /*F
From the state where the university is located		14 *m & 25 f*
From other states of India		17*M & 10 F
NRI students		0
Foreign students		0
Total		66

#### **AMRITA SCHOOL OF MEDICINE, KOCHI**

Students	UG	PG	Integ rated Mast ers	M. Phi l.	Ph. D.	Integ rated Ph.D	D.Li tt./ D.Sc	Cer tific ate	Di plo ma	PG Dipl oma
	*M/ *F	*M /*F	*M /*F	M /*F	M /*F	*M /*F	*M/ *F	*M/ *F	M/ *F	*M /*F
From the	650	350		1						35

Students	UG	PG	Integ rated Mast ers	M. Phi l.	Ph. D.	Integ rated Ph.D	D.Li tt./ D.Sc	Cer tifi cate	Di plo ma	PG Dipl oma
	*M/ *F	*M /*F	*M /*F	M /*F	M /*F	*M /*F	*M/ *F	*M/ *F	M/ *F	*M /*F
state where the university is located										
From other states of India	149	150								13
NRI students	0	0	0	0	0	0	0	0	0	0
Foreign students	0	0	0	0	0	0	0	0	0	0
Total	799	500								48

#### AMRITA SCHOOL OF DENTISTRY, KOCHI

Students	UG	PG	Integ rated Mast ers	M. Phi l.	Ph. D.	Integ rated Ph.D	D.Li tt./ D.Sc	Certif icate	Di plo ma	PG Dipl oma
	*M/ *F	M /*F	*M /*F	M /*F	M /*F	*M /*F	*M/ *F	*M/ *F	M/ *F	*M /*F
From the state where the university is located	49/ 275	11/ 12							3/4	
From other states of India	6/ 12									
NRI students	0/1									
Foreign students										
Total	55/ 288	11/ 12							3/4	

#### 29. 'Unit cost' of education

*(Unit cost = total annual recurring expenditure (actual) divided by total number of students enrolled)*

- (a) including the salary component = Rs. **2,83,688.37**  
 (b) excluding the salary component = Rs. **2,19,116.12**

30. Academic Staff College

Not Applicable

31. Does the university offer Distance Education Programmes (DEP)?

Not Applicable

32. Does the university have a provision for external registration of students?

Yes  No

If yes, how many students avail of this provision annually?

33. Is the university applying for Accreditation or Re-Assessment? If Accreditation, name the cycle.

Accreditation: Cycle 1  Cycle 2  Cycle 3    
 Cycle 4  
 Re-Assessment:

34. Date of accreditation\* (applicable for Cycle 2, Cycle 3, Cycle 4 and re-assessment only)

Cycle 1: ...**29<sup>th</sup> Jan 2008**... (dd/mm/yyyy), Accreditation outcome/Result  
 ...**A grade with a CGPA of 3.2**

Cycle 2: ..... (dd/mm/yyyy), Accreditation outcome/Result .....

Cycle 3: ..... (dd/mm/yyyy), Accreditation outcome/Result .....

Cycle 4: ..... (dd/mm/yyyy), Accreditation outcome/Result .....

\* Kindly enclose copy of accreditation certificate(s) and peer team report(s)

35. Does the university provide the list of accredited institutions under its jurisdiction on its website? Provide details of the number of accredited affiliated / constituent / autonomous colleges under the university.

Not Applicable

36. Date of establishment of Internal Quality Assurance Cell (IQAC) and dates of submission of Annual Quality Assurance Reports (AQAR).

IQAC ...17/04/2009... (dd/mm/yyyy)

AQAR (i) ...10/11/2012... (dd/mm/yyyy)

(ii) ...10/11/2012... (dd/mm/yyyy)

(iii) ...28/12/2012... (dd/mm/yyyy)

(iv) ...27/12/2012... (dd/mm/yyyy)

(v) ... 23/08/2013... (dd/mm/yyyy)

37. Any other relevant data, the university would like to include (not exceeding one page).

The university has undertaken, and continues to undertake, serious efforts to contribute towards environment consciousness.

- a. Conferences with thematic discussions and technical presentations on

sustainable development, renewable energy, and green initiatives. These have attracted the support and patronage of renowned personalities such as His Excellency, Former President of India, Dr. A. P. J. Abdul Kalam, Hon. Minister Dr. Farooq Abdullah (Ministry for New & Renewable Energy), Dr. R. K. Pachauri (Nobel Laureate, TERI, New Delhi), Prof. Michael Gretzel (Scientist & Director, EPFL, Lausanne, Switzerland) – known as the father of dye-sensitized solar cells, and many others.

- b. Water treatment – At the headquarters, in Amritanagar, Coimbatore campus alone, there are five effluent treatment plants, processing over 13 lakh liters of water per day. Additionally, the careful planting and nurturing of trees in the campus has caused a beneficial effect to the vegetation and climate of the land adjacent to, and surrounding, the campus.
- c. Student awareness – through a unique hands-on method of teaching, the mandatory course Environmental Studies has raised the awareness of students towards the critical issues in the area, and has led to their participation in several projects and campaigns aimed at sustainable living and sustainable development. This also includes an online lecture, discussion, and Q&A forum, facilitated via the A-VIEW (Amrita Virtual Interactive E-learning World) platform, with eminent personalities like Dr. R. K. Pachauri (Nobel Laureate, TERI, New Delhi) involved and leading the discussions.

# Criterion- wise Inputs & Analytical Report

## C. Criteria-wise Inputs

### CRITERION I: CURRICULAR ASPECTS

Under this aspect, we shall summarize the university's efforts to continuously and assiduously address the following values identified by NAAC: alignment with institutional mission & vision, alignment with national and global needs, multi-skill development, academic flexibility, and involvement of stakeholders.

### Curriculum Design and Development

#### Reflection of the institutional vision and mission in the academic programmes of the university

- The vision and the mission of the university are focused on the establishment, and effective utilization, of a system of wholesome and holistic learning, with the objective of achieving student success in terms of professional development and personal development, with a strong foundation and undercurrent of ethics and values. This vision has been described as the Chancellor as Education for Life in addition to Education for Living.
- We consider three general aspects of academic programs: program design, program delivery, and feedback-based monitoring of the program.
- Program design: In order to meet current and future national and global needs, a large, diverse, and ever-growing set of programs is in place – spanning across sciences, engineering, health sciences, arts, commerce, education, and management. The programs are offered both at foundational as well as specialization levels. Additionally, several common components are designed into the curriculum, such as Cultural education, Yoga, Meditation, Self Awareness & Personal Growth, Media Laws and Ethics, Environmental studies, Corporate & Social Responsibility, Political Science, Social Inequalities, and Sustainability & green solutions.
- Program delivery: The university takes this very seriously and has been successful in ensuring the delivery of the designed programs in the following ways:
  - Students and faculty are given an orientation on the vision, mission, and outlook of the institution, when they join.
  - Special as well as extramural lectures are arranged on a continuous and regular basis, for students and staff, on values, ethics, culture, social issues, sustainability, etc.
  - A staff cultural camp is held annually, with inspiring talks by eminent speakers on spirituality, cultural heritage, and practical awareness and applications of values/spiritual principles in our professional and personal lives.
  - Faculty development and rejuvenation programs related to society and environment, cultural education, meditation, and yoga have been conducted at our various campuses.
  - Celebration of festivals (where the underlying symbolism and significance are brought out) and other cultural activities;
  - Service to the community and society at large is achieved through NSS, department-level service activities, and institutional-level service. Programmes like Amalabharatham (a nation-wide clean up drive launched by

Mata Amritanandamayi Math, with active participation by students & staff of Amrita University), Cleaning Sabarimala temple premises during the pilgrimage season, medical camps, blood donation & organ donation drives, are a few examples of service activities undertaken.

○ On the technical side, program delivery is assured via ensuring well qualified faculty and staff, conducting regular faculty development workshops and seminars, regular review and updates to the curriculum to ensure relevancy and currency aligned with the needs of the stakeholders (employers in industry, government departments & labs, other educational institutions, and the community at large).

● Program-monitoring: The adequacy of program curricula, effectiveness of the program delivery mechanisms & activities, and the program growth, are reviewed and deliberated upon, at various forums (including departmental meetings, IQAC meetings, and Undergraduate Programs Committee meetings, Postgraduate Programs Committee meetings, and Academic Council meetings). Corrective/improvement actions are documented and followed up on. Feedback is obtained from employers (through department-level contacts as well as through our Corporate & Industrial Relations office), students, and parents.

#### [Systematic process for the design and development of the curriculum](#)

The university follows a highly structured process in the design and development of the curriculum. The curriculum design and development which takes place every four/two years (UG/PG) takes into consideration the trends of the society and the nation, in terms of technological changes, human resource needs, research requirements, industry demands, employability needs, societal needs, and the needs of all the other stakeholders.

The revision process is initiated by the academic council which constitutes the Board of Studies (BOS) committee for each degree program. Eminent academicians and top industrial experts are invited to be part of the BOS that decide and revise the curriculum once every four years for undergraduate (UG) and once every two years for postgraduate (PG) programmes. All the faculty members of the department are involved in the formulation of the curriculum and syllabus, and create an initial draft, that is subsequently discussed in detail in the BOS meeting. The discussions are set up by including faculty and experts from across the various schools of AMRITA (with relevant subject matter expertise). As per university regulations, new electives can be introduced subject to approval by the academic council.

Even in the cases where the APEX regulatory body (such as, MCI, CCIM, etc.) specify the curriculum, Amrita University uses that as a foundation, and enhances it with other courses, to provide for all round development of the student.

The national and social needs are assessed based on the reports such as:

- Government of India:
  - All India Survey on Higher Education (AISHE) by MHRD.
  - 12th Five Year Plan on Higher Education by Planning Commission
  - Higher Education in India -Issues related to Expansion, Inclusiveness,

Quality, and Finance :

- UGC Report
- “National Mission on Education through ICT” (NMEICT) Report of the National Knowledge Commission on Higher Education
- Business and Corporate feedback
- Feedback from the industry associations such as: CII, FICCI, and NASCOM
- Inputs also taken from professional bodies in the relevant area, e.g B.Tech Computer Science curriculum takes inputs from ACM model curriculum for computer science, BA ( Mass Communication) and MA (Communication) curriculum takes inputs from UNESCO model curriculum framework for journalism programmes
- “Making the Indian higher education system future ready” - FICCI Higher Education Summit, 2009
- E-mail portal : "India Education Review", editor@indiaeducationreview.com
- Articles in business magazines (such as Business India), and national newspapers, etc.

Additionally, valuable feedback is obtained from the Faculty, Alumni, and Students in the following ways:

- Faculty attending scholarly events (conferences, workshops, seminars, symposia, etc., provide a report with suggestions aimed at improving the curricula or the program delivery)
- Feedback from the parents at the time of Counseling
- Feedback from the academia / academic experts / industry experts during the interactions with them during the conferences and other programs conducted at Amrita campuses
- Feedback from company representatives coming for placement

#### Aspects of curriculum design and development

**Employability** – This is ensured by including design and practice oriented courses/electives. To ensure wholesome and holistic learning, the curriculum addresses not only the domain knowledge for a specific program of study, but supplements it with knowledge and skills in other areas, such as, languages, technical and business communication, humanities, cultural education, personal development & well being, and soft skills.

- Core courses and electives are designed to deliver towards the foundational and specialized needs, based on a study of the latest developments in terms of research and applications in each domain area.

- Faculty members attend international and national conferences and participate in the industry sponsored conferences and workshops to understand the current trends in the industry and encourage the students to do research and innovations needed by the industry.

Some of the electives are offered by the employers themselves. Infosys, Tata Consultancy Services (TCS), HCL and Robert Bosch are some the employers who have participated in this process

-

- Many of the curricular projects are real problems from the industry or society. This enables students to develop practical skills in applying their knowledge in real-world situations, thus enhancing their employability.
- Seminar courses provide an opportunity for the students to pick up presentation skills while learning about the latest developments and applications in their domain area.
- The Corporate & Industry Relations (CIR) directorate conducts training on aptitude, verbal, analytical reasoning and soft skills packaged as a comprehensive Life Skills programme for both UG and PG students. These are built into the curriculum and the timetable.
- Students are also encouraged to do their summer and winter in-plant training / internships in various organizations.
- Foreign language coaching is conducted to cater to the requirements of Multinational Companies.

**Innovation** - The ever expanding need for knowledge and information, the constraints of academic calendar, and student diversity, all, call for continuous innovation in the curriculum design and approach to the teaching – learning process. For some of the programs, we also benefit from a review of the AICTE Guidelines for curriculum design and development.

Additional electives in UG and PG are approved based on the inputs from the faculty.

**Research** – Eminent academicians and research scientists are invited to be part of the Board of Studies. The Curriculum is designed in such a way that the students are exposed to study subjects which are interdisciplinary in nature, being offered by other departments under the category “Open/Global” Electives.

Students with research interest are provided various avenues to take up projects. These are either within Amrita, by joining teams of ongoing sponsored research projects or social projects, or outside Amrita – affiliated with industrial/business organizations, R&D labs, NGOs, etc. Many of these result in publications in journals of repute and/or conference proceedings.

Students are encouraged to participate in various competitions that are being conducted by many institutes and universities, and have won prizes in research related topics. (Examples: ICT Mumbai Technology Development Award, TITAN Innovation Award, IBM Great Mind Challenge, Amrita Technology Business Incubator (TBI) Innovation Competition, etc.).

Some new initiatives to promote research activity include the following:

- Compulsory requirement for every PG student to have a publication in a reputed journal or conference, preferably journal with impact factor and/or Scopus listing or conference indexed in Scopus.
- Compulsory requirement for every Ph.D. research scholar to have a publication in a reputed journal or conference, preferably journal with

impact factor and/or Scopus listing or conference indexed in Scopus every year after advancing to candidacy and completed the comprehensive examination.

- Incentives are given to students for pursuing research work of a high quality to result in publications in scholarly journals of repute.
- Several research oriented courses are offered. For e.g.: Social Science Research methods, Statistical Methods for Researchers, Research Methodology, etc. Apart from these, there are numerous courses offered in the various domain areas.

#### Conformance to guidelines of the regulatory bodies for developing and/or restructuring the curricula

We carefully study, analyze, and conform to, the guidelines given by the regulatory bodies, like AICTE, UGC, MCI, PCI, CCIM, etc. The university has also submitted a proposal for starting an Innovation University responding to the call for proposals by MHRD. Additionally, we write to the top bureaucrats giving our suggestions for improving the academic environment in the country. We have submitted a large number of proposals and we are collaborating with MHRD on a number of projects for developing Technology Enhanced Higher education in India.

Curricular inputs are also taken from professional bodies in the relevant area. B.Tech Computer Science curriculum takes inputs from ACM model curriculum for computer science,

Amrita School of Communication (ASCOM) follows the UNESCO Model curriculum for Mass communication. The curriculum of Journalism and Mass Communication at Amrita School of Communication received the “Best Curriculum for Communication Studies” award (Indy’s award – Feb 2012).

#### National Reform or Impact Achieved

As part of the National Pedagogy Project, seventeen of our faculty members have been selected as course developers – these will be shared across the nation. The courses are listed below:

1. Engineering Chemistry
2. Engineering Physics
3. Programming and Data Structures
4. Chemical Process Technology
5. Sustainability and Green Chemistry
6. Chemical Systems Modeling
7. Telecom Transmission and Switching

In line with the trend of today’s classrooms becoming virtual, global and personalized. AMRITA has developed a unique E-learning system, A-VIEW, Amrita Virtual Interactive E-Learning World, which is cutting-edge video conferencing software, customized explicitly for Universities. This system is the preferred system for this national mission on education using ICT of the government of India and is being currently deployed at all 60 universities and 30,00 colleges all over India free of cost. This system addresses the most pressing issue of higher education in India today, namely, the shortage of

highly qualified teachers. A-VIEW brings classroom teaching, live from expert teachers and resource persons at reputed institutions as well as foreign universities to eager students at numerous locations all over India. A-VIEW has proved to be a huge success, and has created a large impact in terms of increasing the outreach of quality education across the nation.

#### **University interaction with industry, research bodies and the civil society in the curriculum revision process**

Amrita faculty members regularly interact with the industry and the research community (national and global) while attending the national / international conferences and workshops, seeking their views for the development of curriculum and teaching learning process.

In addition to having various industry professionals and scholarly professors from leading institutions as members in board of studies, feedback is elicited from industry during the placement process. Corporate Industry (CIR) directorate documents these inputs and this is escalated to academic departments.

On a collaborative basis, there is joint development of offering of electives by industry. Infosys, Tata Consultancy Services (TCS), HCL and Robert Bosch are some the employers who have participated in this process

Most of our faculty members have membership / office-bearer positions in professional societies like IEEE, ACM and SAE in their respective domain areas.

The departments and research groups in the humanities and social sciences areas interact with NGOs and civil societies frequently.

The feedback is documented formally and used during the deliberations of the BOS for framing the curriculum.

#### **Academic Flexibility - List of Programmes Offered**

##### **Bachelors**

1. [MBBS](#) | [BDS](#) | [B Pharm](#)
2. B Sc (Medical)
  - Anesthesia Technology
  - Bachelor of Audiology & Speech Language Pathology (BASLP)
  - Cardio Vascular Technology
  - Cardiac Perfusion Technology
  - Diabetes Sciences
  - Dialysis Therapy
  - Echocardiography Technology
  - Emergency Medical Technology
  - Medical Laboratory Technology
  - Medical Radiologic Technology (BSc MRT)
  - Neuro Technology (Post Basic)
  - Optometry

- Optometry (Lateral Entry)
- Physician Assistant
- Respiratory Therapy
- 3. [B Sc Nursing](#)
- 4. [BAMS \(Ayurveda\)](#)
- 5. [B Tech](#)
  - Aerospace Engineering
  - Chemical Engineering
  - Civil Engineering
  - Computer Science and Engineering
  - Electrical and Communication Engineering
  - Electrical and Electronics Engineering
  - Electronics and Instrumentation Engineering
  - Mechanical Engineering
- 6. BSc
- 7. [Biotechnology /Microbiology](#)
- 8. BBM / BCom / BSc / BCA
- 9. [BA \(Mass Communication\)](#)
- 10. BEd

#### **Integrated**

- MSc

[Mathematics / Physics / Chemistry](#)

- [MA English](#)

#### **Masters**

- A. MD / MS / DM / M Ch
- B. MSc (Health Sciences)
  - MSc MLT (Biochemistry & Pathology)
  - MSc Neuro Electro Physiology
  - MSc Respiratory Therapy
  - MSc Swallowing Disorders & Therapy
  - MSc Clinical Research
  - MSc Biostatistics
  - Master of Hospital Administration (MHA)
  - PG Diploma in Medical Radiological Physics
- C. [MDS / M Pharm / Pharm D](#)
- D. [MSc \(Nursing\)](#)
- E. [Nanosciences](#)
- F. [MTech](#)
  - Automotive Engineering
  - Automotive Systems
  - Bio-Medical Engineering
  - Chemical Engineering
  - Computational Engineering and Networking
  - Computer Science and Engineering
  - Computer Vision and Image Processing
  - Cyber Security
  - Embedded Systems
  - Engineering Design
  - Manufacturing Engineering
  - Power Electronics

- Remote Sensing and Wireless Sensor Networks
  - VLSI Design
  - G. [MCA / MBA](#)
  - H. [MSW / M Com / MFA](#)
  - I. MSc
  - [Biotechnology / Microbiology / Bioinformatics & Computational Biology](#)
  - J. [MA \(Communication\) / PGDJ](#)
  - K. [PG Diploma](#)
  - Wind Power Development
  - Wind Resource Assessment
  - Journalism
- Research Programmes
- Ph.D. programs

#### [Credit accumulation and transfer facility](#)

Certain courses are identified as core courses, certain others as allied courses and few other electives. There is mandatory registration and credit earnings requirement for core courses. While it is mandatory to register for the allied courses, failure to earn credit in them does not necessarily mean repeating the courses. Often another course may be permitted as replacement courses. Electives are free to be chosen from those offered. Students have options to take global electives offered by other departments.

Our Curriculum contains core courses in the primary area of the program and elective courses apart from seminar courses, projects, etc. Interdisciplinary courses are offered as open electives.

#### [Enrichment courses](#)

In order to provide a competitive edge to the students for their professional career, several certificate courses are conducted on a regular basis (every semester/year). A few are listed below:

- Application of C Programming for Chemical Engineering
- Nanoscience and Nanotechnology
- Statistical Design of Experiments
- Measurement Systems Analysis
- Application of C Programming for Chemical Engineering
- Cisco Certified Network Administration (CCNA)
- Red Hat Certified Engineer (RHCE)
- Tally ERP
- CFD and CNC programming using Edge CAM

#### [Lateral and vertical mobility within and across programmes, courses and disciplines](#)

- At the end of first year 10% of the students have options to migrate to other departments.
- Students have options to do interdisciplinary projects with guides from

other departments.

- Students have option to do internship / industry project in leading national research agencies and industries during the final semester in lieu of doing projects within department.
- Students have option for Semester Abroad programme and exchange programmes in top foreign universities

### Policy and strategy for attracting international students

Amrita University has established several linkages with over 75 top ranked universities in USA, Europe, Japan and Australia. This has resulted in several exchange programs. Additionally, we also attract students from other countries in South Asia.

There are Twinning and collaborative programmes with various foreign universities like Vrije University, Netherlands; State University of New York (SUNY), Buffalo; KTH-Royal Institute of Technology, Stockholm; University of New Mexico; Polytechnic University of Catalonia (UPC), Barcelona.

A dynamic group of staff members with international experience work under the Amrita Center for International Programs (ACIP) and have achieved great success in various programs related to faculty exchange, student exchange, MoUs, research collaborations, guest lectures, consultation, etc.

### Self-financing programmes

We are a self financing university with no external funding and help for our operations.

All the policies for admission, fee structure, faculty recruitment, and faculty salaries are as per the guidelines and norms of the governing bodies (such as UGC, MCI, PCI, CCIM, etc.).

### Choice Based Credit System (CBCS)

All our technical education is based on CBCS ever since we became a University, in 2003. The health sciences programs conform to the norms and requirements of their respective regulatory bodies (and evaluation is based on marks and percentages).

### Inter-disciplinary programmes

Inter-disciplinary programmes promoted by the University are:

- M.Tech (Biomedical Engineering) which is received well by industries and other institutes.
- PG Diploma program in Wind Resource Assessment
- PG Diploma program in Wind Power Development with sponsorship from C-WET and IWTMA which spans across electrical engineering, aerospace engineering, mechanical engineering, and economics.
- M.Tech. Programmes in
  - Automotive Systems
  - Computational Engineering and Networking

- Cyber Security
- Embedded Systems
- E-learning Technologies
- Cyber Security Systems and Networks
- M.Sc. Programmes in
  - Medical Informatics
  - Bioinformatics
- Research Programmes
- Ph.D. programs
- M.S. by research

AMRITA Vishwa Vidyapeetham has taken a lead in introducing several innovative and interdisciplinary programmes, some of which have been started for the first time in India. Some of the innovative programmes include M.Tech in Cyber Security; M.Tech in Nanomedical Sciences; M.Tech in Molecular Medicine; M.Tech in Cyber Security Systems and Networks; M.Tech in E-learning technologies; M.Sc in Medical Informatics; M.Sc in Bioinformatics; Master of Medicine in Emergency medicine; PG Diploma in Clinical Research etc

#### Curriculum Enrichment

Curricula of the university are reviewed and upgraded for making it socially relevant and/or job oriented / knowledge intensive to meet the emerging needs of students and other stakeholders. This is done once every four year for UG programs, and once every two years for PG programs. New electives are introduced every six months, based on the requirement.

During the last four years, the following new programmes at UG and PG levels were introduced.

#### PG Programmes:

- Diploma            23 courses (Medicine)
- MD                    15 courses (Medicine)
- MS                    1 course (Medicine)
- DM                    4 courses (Medicine)
- M.Ch                 4 courses (Medicine)
- MHA
- Integrated M.Sc. (Chemistry)
- Integrated MA (English, Language & Literature)
- M.Com. (Commerce, Management, Finance with System)
- M.Sc. (Computer Science)
- Five Year Integrated M.Sc. (Chemistry, Physics, Mathematics)
- M.Tech. (Automotive Engineering, Automotive Systems)
- Five Year Integrated M.A. (English Language and Literature)
- Post Graduate Diploma (Wind Power Development, Wind Resource Assessment)
- MSW (Disaster management, and Child Rights & Child Protection are the two specializations added as per the current needs.)

- Specializations in Dentistry: Radiology, Oral Surgery, Periodontics, Pedodontics, Orthodontics, Prosthodontics, Community Dentistry, Oral Pathology, Conservative Dentistry.
- Post Basic Nursing programme
- M.Sc. Nursing
- Part time Ph.D. Programme
- M.PHARM. (Pharmacy Practice (Hospital and Clinical Pharmacy), Pharmaceutics, Pharmaceutical Chemistry)
- Doctor of Pharmacy (Pharm. D. Post Baccalaureate)

#### **UG Programmes:**

- BASLP (Medicine)
- B.Sc. 9 Subjects
- Integrated M.Sc. (Chemistry)
- Integrated MA (English, Language & Literature)
- B.Com.
- Pharm. D. (Regular)

#### **Revision of the existing programmes**

Curriculum and Syllabi are changed every four years. The Board of Studies members are drawn from exceptional academic background from premier academic / research institutes and leading industries. We are continuously in touch with the industry to access the new needs and developments so that we can respond with appropriate academic programs. The syllabus is periodically updated to meet the needs of the industry and emerging areas of research interest.

Depending on the specific program, anywhere from 30% to 100% of the courses have undergone revision.

#### **Value-added courses offered by the university**

The list below shows value added courses that help the university in achieving several objectives relative to the learning outcomes of the students: soft skill, professional orientation & employability, community orientation, research orientation, and personal well-being & personality development.

- Value Education
- Soft skill courses are offered by the Corporate & Industrial Relations (CIR) department to all students, and are included in the curriculum, for credits.
- Courses with CISCO, Tata Elxi, Infosys and National Instruments
- Self-Awareness and Personal Growth
- Environmental Management and Sustainable Development
- Managerial Values and Business Ethics
- Work life balance (WLB) a Colloquium
- Yoga
- Meditation
- Concepts of Psychology
- Certificate Course in SANSKRIT
- Tally ERP, e-filing, CISCO-CCNA and Redhat
- Java Programming

- Electives such as Business Ethics, Environmental science
- Application of C Programming for Chemical Engineering
- Advanced Material Characterization Techniques
- Nano Science and Nano Technology
- Statistical Design of Experiments
- Measurement Systems Analysis
- Language Electives
- C# and .NET
- Internet Technology
- Advanced Databases
- Elective on Green Chemistry and Green Technologies
- Elective on Composites
- Training in the field of Endodontics and Implantology
- Nursing service of the hospital provides orientation programme where the M.Sc. and Post Basic Nursing students undergo Advanced Cardiac Life Support (ALS) and Basic Cardiac Life support (BLS) training and certification

#### Skill development programmes

NOTE: While the section below is not about courses offered to students of the university, it nevertheless describes a set of value-added courses offered to the community that are of national importance, and hence is captured here.

Amrita University's AMMACHI Labs (Amrita Multi Modal Applications and Computer Human Interaction Labs) is a center of technological innovation breaking new ground in the field of computer-human interaction, developing applications designed to improve the quality of life for the least fortunate among us. The core value of all research at AMMACHI Labs is to provide innovative technological solutions that are affordable to the masses.

Using Human Computer Interaction technology, powered by the modalities of multimedia and Haptics that greatly improve accessibility and scalability, AMMACHI Labs aims to augment skill development, life enrichment education, healthcare, disaster risk reduction and much more. We span a wide range of focus areas such as, Haptic technology, Virtual reality, simulation training, Serious games, Medical Rehabilitation, Augmented reality, Psychophysics, Information architecture, and more.

The key projects undertaken by AMMACHI Labs are:

- Sakshat Amrita Vocational Education (SAVE) Project: SAVE has developed computerized vocational training software applications using multimedia, virtual reality and haptics that is being used to impart education to impoverished communities in India providing portable, cost effective, scalable and standardized vocational training courses. SAVE includes indigenously designed, low-cost and durable haptic devices to assist in skill development minimizing the dependency on expensive heavy-duty tools, machinery and materials and supplementing for a lack of teachers. ([www.sakshat.amrita.ac.in/save](http://www.sakshat.amrita.ac.in/save))
- Women Empowerment (WE) Project: To address economic and social barriers faced by women in India, AMMACHI Labs seeks to economically and socially empower 3000 impoverished women, utilizing SAVE's

computerized, university-certified Vocational Education and Training that is supplemented by Life Enrichment Education (LEE). Funded by the United Nations Democracy Fund, the WE project has as of December 2012 trained 1000 women from Kerala, in various technical and non-technical trades such as fabric painting, soap making, ornamental jewelry making, vegetable cultivation and flower arrangement. Training is made available to women with a total household income of or below Rs. 100 per day, as well as to those who are unemployed, widowed or otherwise lacking financial independence. The project also aims to target women in those communities that were relocated due to construction of dams and not provided with adequate compensation. Women from Kerala made global headlines recently, when they successfully broke through many social barriers to take on the challenging profession of plumbing.

- Mobile Vocational Education (MoVE) Project: In a bid to take vocational education to remote areas, AMMACHI Labs has developed the MoVE project that utilizes fully equipped solar powered vehicles to provide vocational education in logistically and geographically diverse areas. MoVE has increased outreach, reduced operating cost, and helps in teaching at multiple locations. The mobile school currently services remote communities in support of the Women Empowerment Project, and has been instrumental in training over 400 women beneficiaries in various vocational trades.

AMMACHI Labs has successfully executed a pilot & extended pilot with MHRD to develop computerized vocational training modules for many vocational trades, haptic devices, simulation interfaces etc. The WE project has trained over 1500 women till date and have effectively used the MoVE unit to train in the rural / tribal regions. AMMACHI Labs is now working towards research and development of effective skill training simulators, expanding the course development to a large number of sectors, and executing deployment projects across India.

### [Feedback on Curriculum](#)

There is no formal mechanism to collect feedback from students on the curriculum design. Nevertheless, suggestions from serious students gathered from time to time are incorporated, with necessary modifications, whenever revision of curriculum & syllabi is taken up.

The university collects feedback from alumni with respect to curriculum, along with other aspects of the teaching learning process.

The university discusses the vision /mission / goals of the department with the students at the time of revision of syllabus and curriculum, once every four/two years (UG/PG).

The faculty members and administrators discuss the curriculum and syllabi with national and international faculty who visit our campus and during participation in national and international conferences & workshops. Our faculty members also interact with faculty from national level like IITs, IISc, and NIT through direct meeting, or by emails. This improves the standard of curriculum.

### Policies regarding admission, fee structure, and salary relative to aided institutions

Admissions are done based on clearly specified and communicated criteria (stated in the brochure, advertisements, and other communications to potential applicants). Some of the programs have an all India entrance test. Fee structure varies across the different programs, and they are generally higher than those of aided institutions. Salaries are guided by the norms of the regulatory bodies such as UGC.

## CRITERION II: TEACHING-LEARNING AND EVALUATION

Here, the focus is on describing the mechanisms and process in place, at Amrita, that are targeted at fostering the following values: Catering to student diversity (Learner-centered education), Adequacy and competence of faculty, Quality & range of pedagogical methods, Efficiency of techniques used to evaluate teachers & students, Regulatory compliance & social equity in the admission process, Continuous professional development, and Comprehensive assessment of desired outcomes.

With respect to the admission process, publicity and transparency are ensured in the following ways.

- **Publicity:** Advertisements for admissions are published in all leading newspapers every year.
- **Transparency in the admission process:** Depending on the particular program, admission is based on one or more of the following:
  - All India Entrance Exam (B.Tech., MBBS). There is strong demand for admission to various programmes. Over 30,000 students write the B.Tech. entrance examination for 2000 seats. Over 500 students write the MBBS entrance examination for 100 seats
  - National-level common entrance tests (GATE, CAT, MAT, etc.)
  - Program-wise selections system (e.g., written test followed by screening interview/oral exam, for some PG programs)

### Details of Admission Process:

#### (i) Merit

Admission to all programmes are based on the minimum prescribed marks scored by the applicant in the qualifying examination.

#### (ii) Merit with entrance test

Admission to all B.Tech Programmes are based on the applicant's score in the qualifying examination and the rank obtained in the Amrita Engineering Entrance Examination conducted at National level. Details are given below:

❖ **Entrance Test for (UG) B.Tech Admission:** Entrance test conducted by our university (AMRITA Entrance Examination – Engineering) at all India level.

❖ **Eligibility for B.Tech. Admission :** A pass in the final examination of 10+2 (class XII) or its equivalent securing 60% or above marks in Mathematics, 55% or above separately in Physics and Chemistry with an aggregate of 60% in the three subjects

(OR)

A three year Diploma in Engineering with minimum 60% marks, awarded by any State Board of Technical Education.

❖ **Admission process:** Candidates are called for counseling as per the Amrita Engineering Entrance rank. They can opt for any branch according to the availability of seats at the time of counseling.

❖ **Counselling Venue:** Counselling is held at all our three Engineering Schools simultaneously via satellite. Candidates can attend counselling in any one of our campuses. (Coimbatore, Bangalore, Amritapuri)

**(iii) Merit, Entrance test and Interview:**

❖ **Selection Procedure for B. A. (Mass Communication)**

1. Entrance Exam (CAPTEST)
2. Minimum of 50% marks in aggregate in the Higher Secondary Board exam
3. Personal interview

❖ **Selection Procedure for M.A.(Communication)/PGDJ:**

1. Entrance Exam (CAPTEST)\*
2. Group Discussion (GD)
3. Personal Interview (PI)

\* Candidates with 70% or more marks in aggregate or during the first two years of their Bachelor's degree may be exempted from the entrance exam.

❖ **Selection Procedure for M.Tech/MCA:** Admission is based on the performance in the Entrance Test and subsequent Interview apart from minimum eligibility in the qualifying exam in the concerned disciplines as prescribed by the University. Candidates with valid GATE Score are given preference for M.Tech Programme.

❖ **Eligibility for M.Tech. Admission:** B.E/B.Tech Degree or equivalent in relevant branch with Minimum 60% marks

❖ **Eligibility for MCA Admission:** A Pass with 60% marks in Bachelors Degree of minimum 3 years of a recognized University and Mathematics at Plus Two level.

❖ **Selection Procedure for Ph.D.:** The application to Doctoral program is accepted based on merit in the qualifying exam and recommendation from experts. The aspirant has to pass a written exam and qualify in the interview conducted by a panel nominated by the Dean-PG Programmes. With a positive recommendation from the examining panel the aspirant is admitted for Doctoral studies. The aspirant becomes a Doctoral Scholar after earning a minimum of 12/13 credits through course work including research methodology and a pass in the foundation course in Mathematics.

The university admissions office reviews the admission process every year, and implements measures to improve the same. One consequence of this, is that we have succeeded in achieving a higher level of geographical diversity in terms of incoming students.

Number of students admitted in university departments in the last four academic years:

**Amrita School of Medicine, Kochi**

Categories	Year 1		Year 2		Year 3		Year 4	
	Male	Female	Male	Female	Male	Female	Male	Female
SC	5	1	7	3	1	6	3	4
ST	0	0	0	0	0	0	0	0
OBC	49	49	37	67	32	76	31	92
General	67	78	57	98	104	126	37	63
Others	12	26	0	0	1	3	92	69

**Amrita School of Arts & Sciences, Amritapuri**

Categories	Year 1		Year 2		Year 3		Year 4	
	Male	Female	Male	Female	Male	Female	Male	Female

SC	4	0	6	5	11	7	4	1
ST	0	0	1	0	0	1	5	0
OBC	160	172	203	150	198	187	186	103
General	325	253	365	284	353	259	259	163
Others	125	38	0	0	0	0	0	0

#### Amrita School of Arts & Sciences, Mysore

Categories	2010-11		2011-12		2012-13		2013-14	
	Male	Female	Male	Female	Male	Female	Male	Female
SC	02	0	02	01	06	05	Admission process is in progress	
ST	01	0	01	00	05	02		
OBC	45	27	59	39	61	35		
General	81	60	116	80	160	89		

#### Amrita School of Biotechnology, Amritapuri

Categories	Year 1(2009)		Year 2 (2010)		Year 3 (2011)		Year 4 (2012)	
	Male	Female	Male	Female	Male	Female	Male	Female
SC	2	1	1	0	1	4	0	2
ST	nil	nil	nil	nil	nil	nil	nil	nil
OBC	10	40	9	44	11	46	8	44
General	32	84	13	66	15	72	15	69
Others	nil	nil	nil	nil	nil	nil	0	3

#### Amrita School of Engineering, Amritapuri

Categories	Year 2010		Year 2011		Year 2012		Year 2013		Year 2009	
	Male	Female								
SC	3	1	4	7	5	4	3	0	4	2
ST	2	0	0	1	1	0	0	0	0	0
OBC	144	63	141	102	140	87	144	117	110	46
General	213	124	266	153	207	215	262	153	160	117
Others	2	1	3	4	4	5	123	29	0	1

#### Amrita School of Engineering, Bangalore

Categories	2010-11		2011-12		2012-13		2013-14	
	Male	Female	Male	Female	Male	Female	Male	Female
SC	10	6	14	7	9	4	10	5
ST	2	1	1	-	-	-	3	1
OBC	65	31	122	22	77	25	105	19
General	339	116	266	111	257	113	344	124
Others	-	-	-	-	-	-	-	-
TOTAL	416	154	403	140	343	142	462	149
	570		543		485		611	

#### Amrita School of Engineering, Coimbatore

##### Department of Mass Communication, Coimbatore

Categories	BA Year 1		BA Year 2		BA Year 3		MA Year 1		MA Year 2	
	Male	Female								

SC		1							
ST			1						
OBC	7	12	3			5	3	1	
General	10	18	9	16	7	12	2	5	1
Others									2

### ECE Dept., Amrita School of Engineering, Coimbatore

Program me	Categori es	2012 Admission		2011 Admission		2010 Admission		2009 Admission	
		Mal e	Fema le						
B.Tech	SC	27	12	37	24	46	14	22	21
	ST	5	1	4	1	6	0	1	0
	OBC	313	133	352	128	347	147	287	130
	General	376	147	391	131	458	203	422	156
	Others	0	0	0	0	0	0	0	0
		721	293	784	284	857	364	732	307
M.Tech	SC	0	0	0	2	1	2	1	2
	ST	0	1	0	0	0	0	0	0
	OBC	55	55	43	55	41	52	36	45
	General	60	81	76	67	33	78	36	60
	Others	0	0	0	0	0	0	0	0
		115	137	119	124	75	132	73	107
MCA	SC	0	0	0	0	0	0	0	1
	ST	0	0	0	0	0	0	0	0
	OBC	5	7	9	16	11	19	7	19
	General	4	6	12	20	10	22	15	15
	Others	0	0	0	0	0	0	0	0
		9	13	21	36	21	41	22	35

### Amrita Department of Social Work, Coimbatore

Categories	Year 1:2008		Year 2 :2009		Year 3: 2010		Year 4:2011	
	Male	Female	Male	Female	Male	Female	Male	Female
SC	1	-	1	--	--	--	-	1
ST	-	-	--	--	--	--	--	5
OBC	2	1	--	2	7	4	--	1
General	2	5	1	3	3	1	2	5
Others	1		3	2	1	2	1	1

### Mathematics Department, Amrita School of Engineering, Coimbatore

Categories	Year 1		Year 2		Year 3		Year 4	
	Male	Female	Male	Female	Male	Female	Male	Female
SC								
ST								
OBC								3
General								2
Others								

### Amrita Department of Management, Amritapuri

Categories	Year 1		Year 2		Year 3		Year 4	
	Male	Female	Male	Female	Male	Female	Male	Female
SC							1	2
ST								
OBC			2	2	13	8	11	9
General			27	13	23	13	22	21
Others								

#### **Amrita Department of Management, Bangalore**

Categories	2010		2011		2012		2013	
	Male	Female	Male	Female	Male	Female	Male	Female
SC								
ST								
OBC								
General	22	13	26	15	33	17	36	13
Others								

#### **Amrita College of Nursing, Kochi**

Categories	Year 1 (2012-13)		Year 2 (2011-12)		Year 3 (2010-11)		Year 4 (2009-10)	
	Male	Female	Male	Female	Male	Female	Male	Female
SC	1	5	2	5			2	6
ST	-	1	-	-			-	-
OBC	9	117	15	117			8	68
General	21	201	17	197			14	120
Others	1	1	-	-			-	-

#### **Amrita School of Pharmacy, Kochi**

(According to academic year 2012 -13)

Categories	Year 1		Year 2		Year 3		Year 4	
	Male	Female	Male	Female	Male	Female	Male	Female
<b>B.PHARM</b>								
SC	0	0	0	0	0	0	1	1
ST	0	0	0	0	0	2	0	0
OBC	6	22	5	18	6	23	7	23
General	5	27	8	28	7	20	11	16
Others								
<b>PHARM.D</b>								
SC	0	0	0	0	0	0	0	0
ST								
OBC	4	5	0	1	1	4	-	-
General	3	18	2	25	4	20	-	-
Others								
<b>M.PHARM ( 2 Years)</b>								
SC	0	0	0	0	--	--	--	--
ST	0	0	0	1	--	--	--	--

OBC	0	4	1	7	--	--	--	--
General	0	6	2	20	--	--	--	--
Others	--	--	--	--	--	--	--	--
PHARM.D(P B) (3 years)								
SC	0	0	0	0	0	0	--	--
ST	0	0	0	0	0	0	--	--
OBC	2	0	1	2	0	3	--	--
General	0	3	2	4	2	5	--	--
Others	--	--	--	--	--	--	--	--

### Analysis of demand ratio for the various programmes

#### Amrita School of Medicine, Kochi

Programmes	Number of applications	Number of students admitted	Demand Ratio
UG	8013	228	
PG	784	162	
PG Diploma	27	23	

#### Amrita School of Arts & Sciences, Amritapuri

Programmes	Number of applications	Number of students admitted	Demand Ratio
UG	393	140	2.81
PG	202	62	3.26
Integrated Masters	301	97	3.10
Ph.D. This data is for the last three years	8	8	1

#### Amrita School of Biotechnology, Amritapuri

Programmes	Number of applications				Number of students admitted				Demand Ratio			
	2009	2010	2011	2012	2009	2010	2011	2012	2009	2010	2011	2012
UG	21	20	23	28	76	59	84	90	2.8	3.4	2.8	3.1
PG	25	22	26	18	95	80	67	71	2.7	2.8	3.8	2.6

#### Amrita School of Engineering, Amritapuri

Programmes	Number of applications	Number of students admitted	Demand Ratio
UG	5500 (candidates appeared from Kerala)	520 (2013 Admission)	10.57

PG	VLSI-145	24	6
	WNA-63	24	2.62
	P&E-139	24	5.79
	CSNN-57	24	2.37
	CSE-87	24	3.62
	T&F-47	24	1.95

#### **Amrita School of Engineering, Bangalore**

Programmes	Number of applications	Number of students admitted	Demand Ratio
UG (University)	31000	2040	1:15

#### **Amrita School of Pharmacy, Kochi**

Programmes	Number of applications	Number of students admitted	Demand Ratio
UG			
B.Pharm	192	60	
PG			
Pharm.D (Regular)	171	30	
Pharm.D(PB)	50	5	
M.Pharm Pharmaceutics	50	3	
M.Pharm Pharmacy Practice	50	9	
M.Pharm Pharmaceutical Chemistry	50	0	
Integrated Masters	--		
M.Phil.			
Ph.D.	1	1	

#### **Amrita School of Mass Communication, Coimbatore**

Programmes	Number of applications	Number of students admitted	Demand Ratio
UG (2013 -14)	119	48	2.27:1
PG (2013 -14)	32	7	4.6:1
Integrated Masters			
M.Phil.			
Ph.D.			
Integrated Ph.D.			
Certificate			
Diploma			
PG Diploma (2013 -	7	4	1.75:1

Programmes	Number of applications	Number of students admitted	Demand Ratio
14)			
Any other (please specify)			

#### English Department, Amrita School of Engineering, Coimbatore

Programmes	Number of applications	Number of students admitted	Demand Ratio
UG			
PG			
Integrated Masters	42	11	

#### Mathematics, Amrita School of Engineering, Coimbatore

Programmes	Number of applications	Number of students admitted	Demand Ratio
UG			
PG			
Integrated Masters	12	5	
M.Phil.			
Ph.D.	1	1	
Integrated Ph.D.			
Certificate			
Diploma			
PG Diploma			
Any other (please specify)			

#### Programmes discontinued/staggered by the university in the last four years

The M.Tech program in Chemical Engineering was started in 2010 and discontinued in 2012. Most of the B.Tech Chemical Engineers prefer to join the industry and are not opting for higher education in Chemical Engineering. The very few who opt to do so, join IITs or Universities abroad for higher education.

PG Diploma in Wind Resource Assessment, and PG Diploma in Wind Power Development: The programmes were funded for two years from C-WET and IWTMA. However, in lieu of this, M.Tech Wind Energy programme will commence from the academic year 2014-2015.

#### Catering to Student Diversity

##### Orientation / induction program for freshers

The orientation, registration, and enrollment process, together last for 2-3 days.

On the first day that students join the university, senior faculty interact with the students and present them a detailed audio visual account of the prospects of the study as well as the challenges they confront in the world.

This orientation covers vision, mission, rules and regulations including anti ragging, infrastructure, facilities, etc. The students are also advised on the steps that they need to take for a successful career.

Freshers are taken on a tour of the campus by junior faculty to show them the various facilities of the institution.

At Department level the freshers are briefed on the curriculum, subjects, scope, duties & responsibilities of the students, and the role of the teachers.

#### Addressing the “differential requirements” of the student population

Based on the feedback collected from senior students and parents, several committees of the university look in to the requirements of the students. The student welfare department/office in each campus is actively involved in the efforts towards fulfillment of the varied needs of the students.

Bridge courses are offered to an international student as and when required. The university offers the following avenues for students to catch up with their academic deficiencies / shortcomings:

- i. Run-time Redo courses (offered every semester in the last period)
- ii. Contact courses - for Final Semester with less than 2 arrears
- iii. Vacation courses - Course offered during the summer vacation
- iv. Re-registration – students having more than 5 arrears
- v. Reappearance – more than 50% internals
- vi. Fast Track – For final year UG students conducting their curricular project outside Amrita University (in industry, R&D Lab, or other institutions)
- vii. Periodical Test 3 to give opportunity to students who missed the mandatory periodical test for valid reasons
- viii. Students who have not completed the laboratory classes and are given I grade, are given an opportunity to complete the same in the following semester.
- ix. A bridge course CA311-Mathematical Foundations is offered for Lateral Entry MCA students. The classes will be held in the last hour every day.

In exceptional cases the university permits the students to take up additional courses of their choice in any department.

Vacation courses are scheduled by School Academic coordinator in two slots in summer enabling the students to take a maximum of 4 courses.

Fast track courses are offered to final year students to enable them to take up final semester internship with the industry as part of final year project.

All the courses listed in the curriculum handbook will be offered as remedial courses as and when required by the students and it depends on the number of failures.

### **Student Monitoring**

The School has a system in place to continuously monitor every student (both UG and PG). Each student of a class is assigned to an advisor or counselor who keeps track of his/her performance, both academic and non-academic. The advisor/counselors meet the students assigned to him/her and discuss on matters both personal and academic and help in sorting out the issues. The slow learners are assisted by the student counselors to reschedule their academic program so that they can complete their studies in the shortest possible time.

For every program there is a class committee which comprises the faculty handling the classes, and the student representatives. This committee meets frequently (usually at the beginning of every semester and after every periodical test) and discuss the progress of each course and analyze the performance of the class and also discuss any issues in the conduct of the classes.

The student welfare department addresses the non-academic affairs of the students. There is a psychologist available for students in need of special counseling.

### **Advanced Learners**

The University provides opportunity for advanced learners to study one semester or a summer project in reputed universities abroad. Our students avail the benefit of programs like Erasmus Mundus and other student exchange programs. More than 100 students got the opportunity for the semester abroad programme in reputed European and US universities in the last five years. Most of these exchanges were fully funded. With this exposure, as a consequence, many of them subsequently secured post graduate admission in these universities.

Fast-track program is possible for advanced learners wherein students complete the eighth semester course work during the winter vacation following the seventh semester, and are allowed to take up projects at renowned industries & research organizations.

AMRITA offers advance level courses for extra credit, and also encourages students to publish research papers in conferences and journals, via non-curricular research associated with ongoing sponsored research projects.

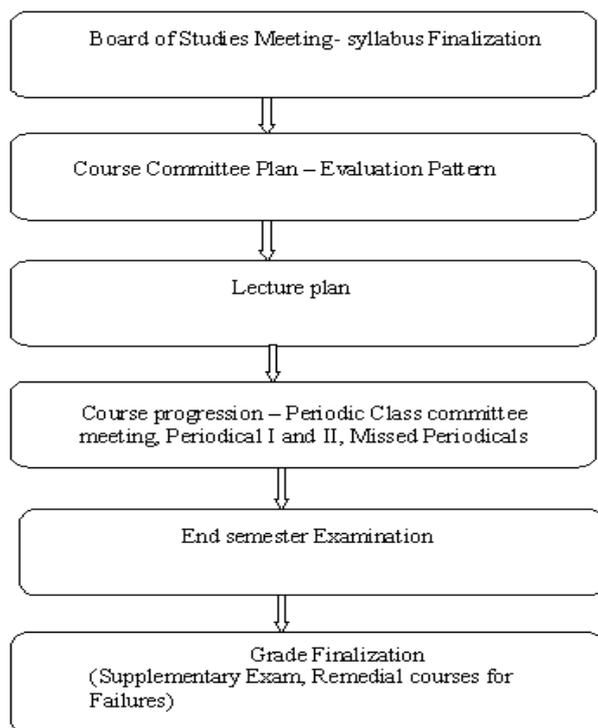
### **Teaching-Learning Process**

#### **Planning and organizing of the teaching, learning and evaluation schedules**

The three engineering schools of the university follow a common calendar with minor modifications considering local sensitivities like festivals. The examinations are on the same day and a common question paper is administered. This process is followed by the three arts science schools as well.

The school prepares the academic calendar for each academic year and this is rigorously followed by all the departments. At the beginning of every semester it is mandatory for every faculty member to prepare and submit a detailed course plan for the subject that he/she is handling. The course plan also includes the evaluation pattern for the subject. Additionally, the faculty is required to maintain a work register, which records the attendance, course delivery, and record of performance in the continuous assessments and examinations.

A flow diagram for the course transaction process is given below.



### Course Mentor Scheme

- A mentor is elected for each course based on their expertise – this is done at the campus level. Thus, if the same course is offered on multiple campus (within Amrita University), there would be more than one mentor for a single course
- A chief mentor is elected for each course
- The chief mentor prepares the common course plan by consulting the campus mentors, and circulates it to course instructors to regulate the courses
- Campus mentors are allowed to set their own question paper for the mid-term exams (periodicals)
- The chief mentors are empowered to create a common question paper for the end semester exam, through the single window system for multi campuses
- Common courses are evaluated by circular valuation system to regulate and maintain uniformity in evaluation

### Course Outlines & Schedules

The students are provided the curriculum and syllabi book when they join the program. The syllabus of each subject is divided into three modules and the

periodical test 1 follows module 1, periodical test 2 follows module 2 and the end semester examination covers all the three modules.

At the beginning of every semester, the students are provided the class time table. They are informed of the course plan prepared by the course mentor and evaluation pattern of each subject.

The class committee comprising the student representatives and course instructors hold a meeting thrice during a semester to evaluate the progress of the courses, student performance, quality of the teaching – learning process, student attendance, and to discuss remedial steps in case of gaps with respect to either student performance or teaching quality.

The effectiveness of the process is ensured by the school head assisted by the academic coordinator of each school.

### Learning Activities & Methods for Holistic Development

- Presenting a topic in class seminars
- Forming groups and working together on a problem / mini – project
- Case studies set up for discussion during the class
- Conducting survey on various aspects of the industries / business organizations / NGOs / Civil Societies
- Presentation of audio visuals covering various aspects of their subject, for enhanced comprehension, visualization, appreciation of practical applications, social impact of technology
- Access to NPTEL lectures
- Term Paper or minor project for each subject
- Real time lab experiments, mini projects, hardware design,
- Final year projects set up with significant research orientation
- Field trips

The university encourages all the departments to invite experts both from academia and industry to deliver guest lectures and seminars. This is also done through the department associations or student chapters of professional societies such as, IEEE, ACM, CSI, IETE, AIChE, SAE, etc.

The department arranges guest lectures and workshops for the benefit of faculty and students. The university meets all the expenses for the guest lecturers covering travel, boarding, lodging and honorarium expenses.

The department organizes national / international seminars, conferences and workshops periodically, for enhanced interaction between academia, industry, researchers, and students.

### Blended Learning Methods

The university organizes a number of lectures through the E-learning platform, covering various disciplines, for the benefit of faculty and students. Amrita faculty members use the E-learning platform to teach students in other

campuses through AVIEW. Likewise, around 100 expert lectures and workshops conducted by other eminent institutions are made accessible to Amrita faculty members and students via AVIEW. Due to space constraints the list is not included here, but is available upon request.

The university has a team headed by Prof. Kamal Bijlani working on E-learning technologies for Higher Education, and to monitor the trends and issues regarding developments in Open Source Community in order to integrate its benefits into the university's educational processes. The AVIEW system developed by Amrita University is being extensively used by over 300 institutions across the nation. Over a dozen universities are also in various stages of implementing the system in their affiliated colleges (e.g., Mumbai University, JNTU-Hyderabad, etc.). It is envisaged A-VIEW will be deployed at all 600 universities and 30,000 colleges all over India free of cost.

AMRITA e-learning research centre also participates in national distance learning programs (Online Gurukul, Ask a Question, Talk to a Teacher etc.). Some inroads have also been made towards MOOC, Blended Learning and Game-based learning.

#### [24x7 Learning Places - Additional Information & Communication Technology \(ICT\) based Facilities for Learning](#)

- The faculty members make use of open educational resources and e-learning facilities as and when required during the delivery of the course.
- Computer lab with internet
- Studio and Non-linear Editing Lab for ASCOM students
- A-VIEW
- Open Course Wares (OCW)
- Models
- Digital Repository Vidya (which provides access to online resources such as the MIT OCW lecture materials, Feynman lecture series, etc.)
- Virtual laboratory
- Field oriented training for MSW students

Amrita University Management System (AUMS) is a comprehensive software system that was developed in-house, and encompasses all aspects of the university's academic and administrative functioning. A brief discussion of its usage with respect to the above points is given below:

- **Administrative procedures including finance:** includes student and staff profiles, fee management, accounting, issue of certificates (bonafide, transfer certificate, grade sheet, degree certificate, etc.), etc.
- **Student admission:** a state-of-the-art admissions module enables simultaneous counseling for BTech admissions across multiple campuses (in three different states), and the entire data - from issue of hall tickets, to rank data, and entry data upon admission – is captured in the system, subsequently generating roll numbers that feed into the student registration & evaluation processes.

- **Student records:** apart from personal profiles, this includes student registration records, marks & grades, student progression data, progress reports, hostel information, etc.
- **Evaluation & Examination procedures:** the entire gamut of activities from registration through results, including attendance and other data are captured and maintained with appropriate access levels to students, faculty, management, administrative personnel, parents, and other stakeholders.
- **Research administration:** in the staff profile, there is a provision for faculty members to maintain records of research publications, conferences attended, research grants received, etc.
- **Others:** E-learning module – this provides an excellent suite of tools for the teaching-learning process, including the provision to set up question banks, conduct online exams, share teaching materials & resources, host discussion forums, conduct surveys & polls, generate course-related performance-reports, etc.

In-house educational technology development cell, Centre for Research in Advanced Educational Technologies (CREATE) applies innovative digital solutions to provide accessible and affordable educational technologies and instructional software for primary and secondary schools as also builds solutions for universities with a focus on personalized assessment and learning like National faculty expertise system, computer-based medical simulation software, language learning using immersion and research grant management system. An intelligent tutoring and adaptive assessment program has been deployed in over 45 Indian schools in rural and small city neighborhoods. Indian Governments Central Board for Secondary Education (CBSE) has recommended the Online Labs (OLabs) for school experiments for all schools affiliated to this board, which is one of the largest in India.

The university has a digital Repository / library, VIDYA, available on all its intranet portals. Additionally, the staff and students have access to the digital library of the State University of New York (SUNY) – Buffalo. The students are required to download the material into their PCs and view them during their free time at home or in hostel. The course materials uploaded in AUMS and several e-books and learning materials in VIDYA is also available to students 24x7.

Wireless network service is provided on the campus for access by staff and students.

Labs and library facilities are available till late night and shall approach any faculty members at any time over telephone.

### **Student Mentoring & Counseling**

Every class has a class advisor and at least one or two counselors, and each student is assigned to a counselor. The counselor guides the students on academic, personal, and psycho-social matters. It is mandated that the timetable should contain all these details. The university also has a professional counselor and Student Welfare and Counseling departments.

### Innovative Teaching Practices

Online examinations have been introduced as part of internal assessment tests. These help the students to stick to time schedules and have increased their focus on the test. The scores generated by the system give instantaneous feedback/results which have brought in seriousness of purpose.

Multimedia methods are used to supplement the classroom lectures, so as to facilitate a deeper understanding of applications of the theoretical concepts among the students. These include, video lectures, impact of technology / technological failures, market scenarios, social surveys, etc.

### Creative and Scientific Temperament for Learners

The students are given an opportunity to work in the research labs for their final year projects and mini-projects. Students with a research bend of mind are encouraged to associate with faculty who have ongoing research projects and work with the research team. They are encouraged to attend national and international conferences, seminars, and workshops, to get exposure to emerging areas of research and cutting edge technologies.

There is a compulsory requirement for every PG student to have a publication in a reputed journal or conference, preferably journal with impact factor and/or Scopus listing or conference indexed in Scopus

Compulsory requirement for every Ph.D. research scholar to have a publication in a reputed journal or conference, preferably journal with impact factor and/or Scopus listing or conference indexed in Scopus every year after advancing to candidacy and completed the comprehensive examination

B.Tech. students must publish a paper to get Distinction in B.Tech degree.

For MSW students, recorded speeches of eminent academicians / Nobel laureates are arranged.

Innovative ideas were encouraged by providing necessary financial assistance to make them into reality.

To create professionalism, creative and scientific temper, there is strong Co-curricular engagement of students through the conduct of national-level inter-university tech fests and management fests like Anokha, Pragati (Coimbatore campus), Vidyut (Amritapuri campus), Asthra (Kochi campus), Aykya (Bangalore campus) etc.

Students are encouraged to take membership and start student chapters of all major professional bodies in India and abroad like Confederation of Indian Industry (CII), IEEE, Society for Automotive Engineers (SAE), and Association for Computing Machinery (ACM), Computer Society of India (CSI), Institution of Electronics and Telecommunication Engineers (IETE), Indian Welding Society, Student Nurses Association of India (SNAI), Petrotech Society, Indian Institute of Chemical Engineers. CII Young Indians,

CSI and IEEE student chapters are nationally recognized. These associations provide them access to latest tools and tackles in the field as also access to journals, conferences and resources in cutting-edge areas.

### Student Curricular Projects

Curricular projects are mandatory for most UG and all PG programs.

- **Role of faculty in facilitating such projects**
- Student projects are mandatory in the curriculum. UG projects are done either individually, or by a group of 2 to 4 students, and PG projects are done individually. Many of the PG students do their final semester projects in reputed Industries, prestigious institutions, and R&D labs. If the project is industry based or interdisciplinary there will be an external co-guide, but one of the department faculty members is the main guide. It is the responsibility of the project guide(s) to teach the student how to develop a focused approach, conduct the research, and write a report.
- Faculty members handling projects are involved in various capacities. Project Coordinators coordinate the entire work related to project administration and draw the schedule for the reviews & final submission of the project report. Faculty members serve as guides and are in constant touch with students for the duration of the project work. Senior teachers form the panel constituted for the three mandatory reviews. To ensure transparency, greater objectivity, and new perspectives, an external examiner is invited to be a part of the panel during the final project review. The feedback obtained from the external reviewer enhances the quality of the project further.

- \* **Number of projects executed within the university**

Projects are mandatory for each student in each program. They can be either individual or team based, depending on the specific programme.

- \* **Names of external institutions associated with the university for student project work :**

A partial representative list is given below.

HP – Bangalore, Starsoft – Mysore, ISRO –Bangalore, Surabhi Softwares – Mysore, Infosys – Mysore, E-SPADE IT – Bangalore; Indian Institute of Science Bangalore, National Centre for Biological Sciences Bangalore, Indian Institute of Technology (Mumbai and Chennai), Piramal Life Sciences Mumbai, Ranbaxy, Monsanto Bangalore, Cochin University of Science and Technology, TBGRI, National Institute for Interdisciplinary Science and Technology (NIIST, Trivandrum), Rajiv Gandhi centre for Biotechnology - Trivandrum, Regional Cancer Centre – Trivandrum; G4 Matrix Technologies, VSSC Trivandrum. BPCL-KOCHI Refinery, HOCL Kochi. FACT Aluva, HAL Bangalore, NAL Bangalore, BHEL Bangalore, INFOSYS, CADENS - Bangalore, Physical Research Lab, Vysakh Steel Plant, NTPC, KMML chavara, Honeywell, ISRO, NPOL, KPIT- CUMMINS, L&T, BOSCH, Roots Industries – Coimbatore, M/S Sakthi Sugars, Sakthinagar – Erode; Biohydrocarbon project - Pune, Kavin Engineering & Services Private Limited – Coimbatore, Pricol – Coimbatore, Suba Plastics Pvt. Ltd - Coimbatore, Massvil Industries – Kumbakonam, Nearby Panchayat & school.

### Preparation of computer-aided teaching / learning materials

Almost all the faculty members are trained in the use of computer-aided teaching/ learning materials. Amrita VIDYA and AUMS are available round the clock for the usage of faculty. Seminar halls and video projector facilitated class rooms with network connectivity are available. Online assignments, quizzes, and tutorials through AUMS and simulation based experiments (virtual labs) are commonly used. Provision of Internet facility, facility to conduct online examinations, availability of large number of e-books, facility to install course materials in the intranet are prevalent throughout the university in all the campuses.

### Student Feedback on Teachers

There are two primary mechanisms for student evaluation of teachers.

- During each class committee meeting, the class representatives provide feedback on the teaching and class transactions to the committee chairperson for appropriate action.
- Feedback forms submitted by each student for each subject and course instructor at the end of the semester (term).
- The feedback loop is closed as follows. The forms are sent to the school head for analysis. Results of the analysis are submitted to the chairperson of each department. The chairperson holds one-on-one meetings with each course instructor to discuss the feedback, and corrective actions are initiated wherever appropriate. A general summary is then communicated back to the students.

### Teacher Quality

#### Planning and Management of Human Resources

A well-staffed and experienced Human Resource Department exists on each campus, to plan, organize and manage all matters related to recruitment, selection, promotion and reward of the faculty.

The faculty requirement is estimated based on the curriculum and a proposal is submitted to the management at the beginning of every year. An advertisement is released in national newspaper seeking prospective applicants. Job postings are also updated on the university web site. Eligible applicants are shortlisted and called for interview by a selection panel constituted by Head of the school. At the end of the selection process, the selected candidates are offered suitable positions within the department. In case of an emergency, this process is carried out any time during the year. The university, in general, considers recruitment of well qualified faculty with futuristic growth and development in mind, rather than merely to meet the basic regulatory needs.

Faculty are encouraged and supported to pursue higher studies either within the university or outside to enhance their educational qualifications. Appropriate incentives are given for the same.

It is mandatory for every faculty member to have a publication in a reputed journal or conference, preferably journal with impact factor and/or Scopus listing or conference indexed in Scopus every year to be considered for promotion and career advancement.

Furnish details of the faculty

Highest qualification	Professor		Associate Professor		Assistant Professor/ Lecturer / Faculty Associate/ Tutor		Total
	Male	Female	Male	Female	Male	Female	
Permanent teachers							
D.Sc./D.Litt.	2	0	0	0	0	0	2
Ph.D.	64	21	33	21	55	50	246
M.Phil.	2	0	1	1	0	2	6
PG	138	46	67	41	356	369	1017
UG	0	0	0	0	227	158	385
Temporary teachers							
Ph.D.						3	3
M.Phil.				1		1	2
PG					18	10	28
UG							0
Part-time teachers							
Ph.D.	4				4		8
M.Phil.						1	1
PG					7	4	11
UG							0

Total = 1707 teaching faculty

Diversity in faculty recruitment

**Amrita School of Medicine, Kochi**

Department / School	% of faculty from the same university	% of faculty from other universities within the State	% of faculty from universities outside the State	% of faculty from other countries
Amrita School of Medicine	8%	71.7	19.3	1

**Amrita School of Arts & Sciences, Amritapuri**

Department / School	% of faculty from the same university	% of faculty from other universities within the State	% of faculty from universities outside the State	% of faculty from other countries
Chemistry	-	100	0	0
Commerce & Management	0	95	5	0

Department / School	% of faculty from the same university	% of faculty from other universities within the State	% of faculty from universities outside the State	% of faculty from other countries
t				
English	0	93	7	0
Mathematics	0	94	6	0
MSW	0	100	0	0
Physics	12	57	25	6

#### **Amrita School of Arts & Sciences, Mysore**

Department/ School	% of faculty from the same university	% of faculty from other universities within the State	% of faculty from universities outside the State	% of faculty from other countries
Computer Science	17.24 %	77.85 %	13.52%	-
Management & Commerce	-	56%	44%	-
Languages	-	100%	-	-

#### **Amrita School of Biotechnology, Amritapuri**

Department / School	% of faculty from the same university	% of faculty from other universities within the State	% of faculty from universities outside the State	% of faculty from other countries
Amrita School of Biotechnology	11%	29.6%	48.1%	11.1%

#### **Amrita School of Engineering, Amritapuri**

Department / School	% of faculty from the same university	% of faculty from other universities within the State	% of faculty from universities outside the State	% of faculty from other countries
ASE	22	35	35	8
For calculating the above the departments of ECE, CSE, CSA, ME & EEE are considered.				

#### **Amrita School of Engineering, Bangalore**

Department / School	% of faculty from the same university	% of faculty from other universities within the State	% of faculty from universities outside the State	% of faculty from other countries
---------------------	---------------------------------------	---	--	-----------------------------------

ECE	8	12	19	3
EEE	5	4	11	-
CSE	8	6	18	1
ME	2	16	7	-
MATHEMATICS	-	7	4	-
PHYSICS	-	4	1	-
CHEMISTRY	-	4	3	-
ENGLISH	-	2	3	-
CULTURAL EDUCATION	-	1	-	-

#### **Amrita School of Engineering, Coimbatore**

Department / School	% of faculty from the same university	% of faculty from other universities within the State	% of faculty from universities outside the State	% of faculty from other countries
Communication	-	53	47	-
Chemical Engineering and Materials Science	UG - 0 PG - 11 PhD - 5.5	UG - 47 PG - 47 PhD - 11	UG - 53 PG - 53 PhD - 89	PhD - 29
<u>CIVIL</u>	-	43	57	
EEE	28.8	51.11	48.8	2.2
English	nil	54.54	45.45	nil
ECE	34	37	27	2
<u>MSW</u>	--	100%	33.33%	--
<u>CEN</u>	55.5	11	33.5	
Mathematics	0	76.2	23.8	0

#### **Amrita Department of Management, Amritapuri**

Department / School	% of faculty from the same university	% of faculty from other universities within the State	% of faculty from universities outside the State	% of faculty from other countries
Department of Management	44.5%	0	44.5 %	11. %

#### **Amrita Department of Management, Bangalore**

Department / School	% of faculty from the same university	% of faculty from other universities within the State	% of faculty from universities outside the State	% of faculty from other countries
Department of management	Nil	34%	50%	16%

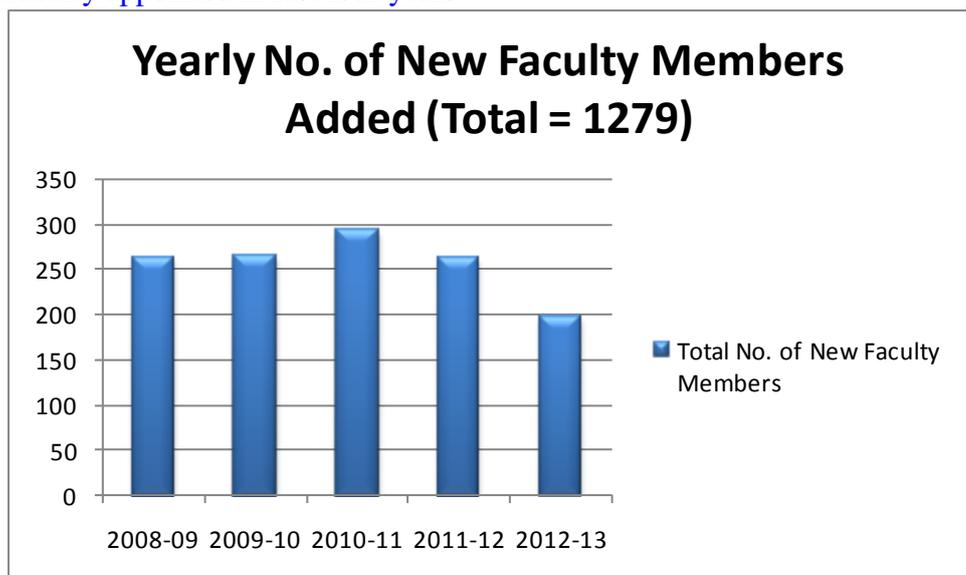
#### **Amrita College of Nursing, Kochi**

Department / School	% of faculty from the same university	% of faculty from other universities within the State	% of faculty from universities outside the State	% of faculty from other countries
Amrita College of Nursing	39 (fulltime) – 100%		0	0

### Pharmacy, Kochi

Department / School	% of faculty from the same University	% of faculty from other universities within the State	% of faculty from universities outside the State	% of faculty from other countries
Amrita School of Pharmacy	25	9	63	3

### Faculty appointed in last four years



### Emeritus / Adjunct Faculty / Visiting Professors

Department	Emeritus	Adjunct Faculty	Visiting Professors
ASCOM			1 *
Chemical Engineering		2**	
Mechanical Engineering		2	2
MSW		1	2
Mathematics			1*

### Academic recharge and rejuvenation of teachers

To academically recharge and rejuvenate teachers, the following facilities are provided.

- Faculty members are encouraged to participate in sponsored research projects (both government and industry).
- Faculty participating in research are provided facilities to set up laboratories and given teaching load reduction.
- There is an incentive scheme to encourage faculty to take up research and publish papers in Scopus indexed journals.
- The university also provides internal research grants, computers, research infrastructure and access to online research journals.
- Faculty members are encouraged for, and assisted with, attending national / international seminars, conferences, and workshops.
- Faculty members are provided study leave and work load reduction to pursue higher studies part-time. Faculty can avail six months leave for writing thesis for PhD. Program. Sabbatical leave of one year is given to faculty having at least seven years of experience.
- The department periodically organizes national / international seminars and conferences and faculty are members of the organizing committee.
- The university provides special casual leave for a period of 15 working days in a year for faculty members to attend seminars, conferences, faculty development programmes, research activities, etc.
- The University encourages faculty members to involve themselves in research activities and it is made mandatory that all faculty members publish at least one paper every year.
- Faculty members can avail seed money for research and for organizing conferences.

### Faculty Participation in Staff Development Programs (last 4 years)

Academic Staff Development Programmes	Number of faculty
Refresher courses	46
HRD programmes	12
Orientation programmes	530
Staff training conducted by the university	184
Staff training conducted by other institutions	101
Summer / Winter schools, workshops, etc.	304

### Faculty invited as resource persons in Workshops / Seminars / Conferences (organized by external professional agencies)

S.No.	Department	%
1	Chemical Engineering and Materials Science	40
2	Electrical and Electronics Engineering	2.22
3	English	20
4	Mechanical	15
5	Electronics and Communication	20

	Engineering	
6	Social Welfare	Many, several times

### Faculty Participation in External Workshops / Seminars / Conferences

The university strongly encourages and supports faculty development. There have been over 3500 instances of faculty members participating in workshops, seminars, and conferences. The university supports via sponsorship of travel, registration, DA, leave, and credit for the participation in these events in the faculty member's performance appraisal.

### Faculty journal publications

An overall picture of the books and journal publications across the whole university is given in the table below, followed by some numbers at the school-level.

Year	No. of Books & Book Chapters Published	No. of Journal/Conference Publications
2008-09	45	222
2009-10	26	335
2010-11	116	757
2011-12	30	1006
2012-13	65	1458
<b>Total</b>	<b>282</b>	<b>3778</b>

Additional details are available in the individual evaluative reports of the departments.

### Faculty serving on the editorial boards of national and international journals:

#### Amrita School of Arts & Sciences, Mysore

1- Dr. Sandhya Joshi was the Peer Reviewer of Journal of Machine Intelligence.

#### Amrita School of Biotechnology, Amritapuri

Dr. Bipin Nair has been selected to the post of associate editor, Current Pharmacogenomics and Personalized Medicine.

#### Amrita School of Engineering, Amritapuri

- Dr. Chandramohan Nair has served as a member of steering committee for several international conferences
- Dr. Nithin Nagaraj - Associate Professor: Reviewer for the International Journals - Image Processing; Information Forensics & Security), European Physics Journal, International Journal of Bifurcation and Chaos, Journal of Theoretical Biology, of Information Sciences (Elsevier), CSIT (Springer) CHAOS (American Institute of Physics), CNSNS (Elsevier), International Journal of Imaging, EURASIP Journal of Information Security, Acta Applicandae, Mathematicae (Springer), Computers and Mathematics with Applications (Elsevier), Mathematical Problems in Engineering (Hindawi),

Journal of Franklin Institute (Elsevier) and Journal of Information Sciences (Elsevier), CSIT (Springer)

- Rajesh Kannan: Reviewer for the IEEE papers.

### Amrita School of Engineering, Coimbatore

EEE	
Dr. K.K. Sasi	Member of Editorial Board, Energy Efficiency Manager, published by SEEM, Trivandrum, from July 2007 onwards
	Member of Editorial Board of Bhavishya – Journal of Engineering Research, from March 2009 onwards
	Reviewer in Elsevier journal: Energy-The International Journal
	On line International Journal on Electrical Sciences, published by College of Engineering, Trivandrum, from Jan 2012 onwards
Dr. S. Balamurugan	Editorial member for International Journal of Electrical and Electronics Engineering Research
	Journal of Electrical and Control Engineering
	Reviewer in Electrical Power Components and Systems, Taylor and Francis Journal
	Reviewer in Karunya Journal of Research
ECE	
Mohankumar	International journal of VLSI design & Communication Systems
Dr. E.P. Sumesh	Procedia Engineering published by Elsevier
	Special Issue in Telecommunication Systems- Springer
CIVIL	
Dr. K.B. Anand	Reviewer in Journal of Materials in Civil Engineering, American Society for Civil Engineers.
Dr. K.M. Mini	Reviewer in (i) Journal of Structural Engineering and Mechanics, Technopress, (ii) Journal of Irrigation Engineering, American Society for Civil Engineers.
Dr. S.P. Anbuudayasankar	<p><b>EDITOR-IN-CHIEF</b></p> <ul style="list-style-type: none"> <li>• International Journal of Decision Making in Supply Chain and Logistics (IJDMSCL),</li> <li>• International Journal of Green Computing (IJGC) - IGI – Global Publishers</li> </ul> <p><b>ASSOCIATE EDITOR</b></p> <ul style="list-style-type: none"> <li>• International Journal of Logistics Economics and Globalisation (IJLEG) - Inderscience Publishers</li> <li>• International Journal of System Dynamics (IJS) - IGI – Global Publishers</li> <li>• International Journal of Operations, Systems and Human Resource Management (IJOSHRM) - International Science Press, Serial Publications</li> </ul> <p><b>GUEST EDITOR – SPECIAL ISSUES</b></p>

		<ul style="list-style-type: none"> <li>• International Journal of Enterprise Network Management (IJENM), Inderscience Publishers (Scopus Indexed)</li> <li>• Guest Editors: Dr. K. Ganesh and Professor S.P. Anbuudayasankar; Special Issue on “Data Analytics Techniques and Heuristics for Complex Supply Chain Network Problems”; Vol.3, Issue 3, 2009.</li> <li>• Guest Editors: Prof. Rainer Leisten, Dr. Immanuel Edinborough, Dr. K. Ramesh Kumar and Dr. S.P. Anbuudayasankar; Special Issue on “Simulation and Optimisation in Manufacturing Systems and Supply Chains”</li> <li>• International Journal of Value Chain Management (IJVCM), Inderscience Publishers (Scopus Indexed)</li> <li>• Guest Editors: Dr. K. Ganesh, Prof. S.P. Anbuudayasankar, Dr. Mukesh Kumar Barua and Dr. Tom Page; Special Issue on: "Empirical, Experimental, Exploratory and Analytical Research for the Smarter Supply Chain – Service and Manufacturing Industry"</li> </ul>
<b>SCIENCE</b>		
Dr. Sivakumar	M.	Journal of Nanomaterials Guest Editor 2013
Dr. Jeyakumar	G.	<p><b>Reviewer:</b> International Journal of Computer Science Issues (IJCSI) International Journal of Swarm and Evolutionary Computation (SWEVO) Reviewer for CNSA 2011, NECOM 2011, WEST 2011, WiMON 2011, AICTY 2011 series held in Chennai, India.</p> <p><b>Member:</b> member for A2CWIC (Amrita ACM-W Celebration of Women in Computing) conducted by Amrita Vishwa Vidyapeetham on December 16-17, 2010.\</p> <p>Technical Committee for ICCA 2012 (International Conference on Computer Applications), Pondicherry.</p>
K.V. Shriram		<p><b>Reviewer:</b> WSEAS Conferences and Journals Tata McGraw-Hill publications. Science and Information Organization.</p> <p><b>Member:</b> International Association of Computer Science &amp; Information Technology (IACSIT). Singapore. Science Alert, Newyork. Science and Information Organization.</p>

	<p><b>Editor:</b>  Assistant editor in International Journal of Research in Engineering &amp; Technology.  Section editor in International Journal of Innovative Technology and Research  Editorial board member of the Sci-Pub Journal - News in Engineering.  Editorial board member of the reputed International Journal of Computer-Aided technologies</p>
ASCOM	
Dr. A. Balasubramanian	Editorial Board Member in Blue Ocean Research Journal
	Reviewer in “The Fourth International Conference on Digital Information Processing and Communications (ICDIPC2014)”, Asia Pacific University of Technology and Innovation (APU), Kuala Lumpur, Malaysia.
ECE	
Sabarish Narayanan B.	Reviewer in IEEE Transactions on Electromagnetic Compatibility
MSW	
Dr. K.R. Priya	Committee Member: ‘Asian Journal of Development Matters’ (print and Online ISSN).
	Committee Member: Afro Asian Journal of Anthropology and Social Policy (Online ISSN)

#### **Amrita School of Dentistry, Kochi**

\* faculty serving on the editorial boards of national and international journals : 2

#### **Amrita Department of Management, Amritapuri**

Name of Faculty	Journal	Role
Dr. Hardik Vachhrajani	IBSU Scientific Journal, Tbilisi, Georgia Publisher : International Black Sea University, Tbilisi, Georgia	Assistant Editor & Reviewer
Dr. Hardik Vachhrajani	International Journal of Information Systems and Social Change (Published by IGI Globa, An Official publication of Information Resources Management Association)	International Reviewer Board Member
Dr. Hardik Vachhrajani	Journal of Higher Education Publisher : Higher Education Forum, Mumbai	Advisory Board Member
Dr. Hardik Vachhrajani	Leadership (Sage, UK) Special Issue on ‘Leadership in Asia, 2011)	Guest Reviewer

Dr. Hardik Vachhrajani	International Journal of Innovation and Regional Development Publisher : Inderscience	Guest Reviewer
Dr. Hardik Vachhrajani	International Journal of Innovation and Sustainable Development Publisher : Inderscience	Guest Reviewer

#### Faculty serving as members of steering committees of international conferences recognized by reputed organizations / societies

Due to space constraints the list is not included here, but there are around 60 instances of faculty members serving in the steering committees of reputed international conferences and societies – these are included in the individual evaluative reports of the departments. The full list is available upon request.

#### Faculty with experience in teaching at other national/international institutions and in industrial positions

The university has been regularly attracting highly qualified faculty from within the country as well as from those with experience abroad. This has enabled us to design and deliver a balanced curriculum in all the disciplines being offered.

#### Academic Development Programmes Organized by University

Innovation in teaching-learning methods is an ongoing process.

Examination reforms are carried out periodically, driven by feedback obtained on the existing mechanisms, discussed in the Undergraduate Programs Committee and Postgraduate Programs Committee meetings, and ratified by the Academic Council, prior to implementation.

Knowledge management, a range of strategies and practices used in an organization to identify, create, represent, distribute, and enable adoption of insights and experiences, is an ongoing process.

Faculty members regularly attend faculty development programs within the department, as well as those organized by other institutions. It is the continuous endeavor of all faculty members to enhance their knowledge management and skills.

At the beginning of each academic year an orientation program is conducted for the faculty members to enable them to handle the subject, plan the teaching-learning methods and strategies, and to decide the evaluation patterns. More experienced faculty members of the university interact with and guide the less experienced ones.

Faculty exchange programs exist and one such example is participation of faculty in Erasmus Mundus program and India4EU.

AMRITA has active tie-ups and collaborations with over 75 universities in USA, Europe, Australia, Japan etc. for joint research, collaborative centres of excellence, cross-continental projects, faculty, student and researcher exchange. There is a huge opportunity to leverage these collaborations and linkages. For example, give every student of AMRITA an international experience; Joint Ph.D. programmes, cross-continental centres of excellence etc. Almost 50 faculty members have benefitted from these tie-ups. Through Erasmus Mundus and India4EU exchange programmes, many of these motilities have been completed funded.

AMRITA is the lead Indian institution and coordinator for India for EU II project as part of Indo-European exchange program which includes universities like POLITO - Politecnico di Torino, Italy; AALTO - Aalto University, Finland; ECN - Ecole Centrale de Nantes, France; Grenoble INP Institut Polytechnique de Grenoble, France-; KTH - Royal Institute of Technology as well as Indian universities like IIT Delhi; Jadavpur University; Anna University, Chennai; Indian Statistical Institute Kolkata; University of Pune.

### **Evaluation Process and Reforms**

**Save-a-year programs:** The conduct of courses is designed in such a way that the low-performing students get additional opportunities to complete their degree program faster. A description of the system is given below:

**Conduct of courses:** Credit system encourages learning. Apart from regular class lectures, students are given major assignments which form a part of the course and are also considered for evaluation. Seminars, design and other assignments, technical paper writing, quizzes etc. are also a part of the course being conducted.

The teacher offering the course evaluates the performance of the students at regular intervals and in the end semester examination.

A class committee exists comprising all teachers handling all the courses for the class, the class advisor and students` representatives. This committee monitors the conduct of all the courses of a class.

A course committee comprising all teachers / mentors offering a course in all the campuses decides on the course plan, evaluation procedure and any midway correction to be taken. Decisions taken by this committee are informed to all students who have registered for the course. The class / course committee, without students` representative, finalizes the grades and results for the class / course.

The following weights are assigned for the evaluation of the courses. This has been revised on some occasions, based on feedback received from the stakeholders, and after due deliberations in the university level committees.

<b>Type of Course</b>	<b>Percent Weight</b>	
	Continuous Evaluation	End Semester Examination / Final Evaluation for Project
<b>Lecture</b>	50 (Minimum two Mandatory tests)	50
<b>Laboratory / Practical</b>	70	30
<b>Project Work</b>	40	60

There is a third test, where required, at the end of the semester in a subject exclusively for the students who have missed either one or both the periodical tests in that course. All periodical tests, including the third shall have equal weights. The third test is conducted before the end-semester examination covering the entire syllabus prescribed for the course.

Students who have missed both the periodical tests can compensate for only one of them. The third test is not a right and students who have abstained from any regular test(s) have to give a formal application for the third test substantiating the reasons for absence through the class advisor and the department chairman, to the Controller of Examinations for consideration.

If a student does not appear for any of the tests, he is not eligible to appear for the end semester examination and has to re-register for the course when offered next.

It is mandatory for the students to appear for the end semester examination / second chance examination for the completion of the course and score a minimum percentage as decided by the course / class committee.

If the Project work is not satisfactory, the student will be asked to continue the project till he / she completes it satisfactorily.

Additionally, the following opportunities are given to the low-performing students to progress towards their degree in a timely manner.

### **Second Chance Examination**

A student who has secured an F grade in a course will be allowed to appear for a second chance examination as per rules. However, FA grade students cannot write the second chance examination.

Second chance examination will be conducted shortly after publishing the results, as per the rules framed for the purpose. Students who were absent for the end semester examination may be permitted to appear for the second chance examination. Permission to appear for the second chance examination will be considered only on the request of the student, who should apply within a week of missing the examination giving genuine reasons for absence.

Permission to appear for the second chance examination will be granted under valid reason by the Dean (Engineering) / Head of the Campus, on the recommendation of the Chairperson of the Department.

### **Summer Term Course**

In one academic year, there are two major periods of study – Odd (July – Nov) and Even (Dec – May) semesters. Vacation courses are also available for additional instructions, if needed.

The departments, considering the need of students and availability of faculty members, decide on vacation programmes. Such vacation courses are offered only to students having backlog of subjects.

In addition to vacation courses, for special deserving cases, contact courses are also offered at times. However, no student has the right to demand for vacation or contact courses.

The evaluation process is printed and published in the institute calendar and distributed to all faculty and students.

At the department level the class counselors and class advisors meet the students and brief them about the evaluation patterns and the credit system.

Progress reports are sent to the parents immediately after the periodical exams by the class advisors.

### **Publishing of Results**

The university publishes the examination results within two weeks from the last day of the examination. It is published through the University website.

Progress Report will be sent to the parents immediately after the periodical exams by the class advisors/counselors. AUMS supports a parental portal through which the parent of the student can view the performance of his/her ward.

### **Transparency in the evaluation process**

- Periodical tests I & II (weight - 15% each) answer scripts are given to the students to verify their marks awarded by the faculty. (They can verify their answer booklet after evaluation.)
- Continuous assessment (weight - 20%) is transparent to the students (Quizzes and Tutorials conducted by the subject faculty will be converted to 20%).
- End semester (weight - 50%), photostat of the evaluated answer scripts will be given to the students as per their request by paying the fees instructed by the controller of examinations.
- A student complainant can request for revaluation of answer scripts of the end semester examination, through a well laid out procedure. A revaluation fee is charged for each paper. If the revaluation leads to a better grade, the

revised grade will be awarded to the student and in such cases the revaluation fee will be refunded in full. Revaluation is allowed only for lecture-based courses.

[Does the university have an integrated examination platform for the following processes?](#)

- **Pre-examination processes** – Time table generation, OMR, student list generation, invigilators, squads, attendance sheet, online payment gateway, etc.

ECE- Time table generation, student list generation, invigilators, squads, attendance sheet.

- **Examination process** – Examination material management, logistics, etc.

ECE- Examination material management, logistics, attendance sheet collection after commencement of the exam (after 30 minutes).

- **Post-examination process** – Attendance capture, OMR-based exam result, auto processing, generic result processing, certification, etc.

ECE- Attendance capture, auto processing, generic result processing, certification, verification of number of answer booklets in each hall with absentees statement.

We have all the above systems functional.

[Reforms in Ph.D. evaluation process](#)

Compulsory requirement for every Ph.D. research scholar to have a publication in a reputed journal or conference, preferably journal with impact factor and/or Scopus listing or conference indexed in Scopus every year after advancing to candidacy and completed the comprehensive examination.

[Streamlining the operations at the Office of the Controller of Examinations - Efforts to improve the process and functioning of the examination division/section.](#)

#### **For Amrita School of Medicine**

From the academic year 2012 onwards, the Exam Control Division has been decentralized into two; (i) for MBBS/PG Diploma/MD/MS/DM/M.Ch. (courses conducted under the statutory body of MCI) and (ii) all other courses (B.Sc./BASLP/M.Sc./MHA). An Assistant Controller of Examination was appointed as the Incharge of the ECD (II). This has greatly improved the situation in conducting the examinations smoothly without any delay in declaration of results etc.

#### **For Other Programmes**

The controller of examinations is responsible for conduct of all university examinations, and it is his duty to arrange for preparation, scheduling, conducting of university examinations and all other incidental matters connected with examinations. The controller of examinations in the execution of his office reports to the vice chancellor periodically in the performance of his/her duties.

The responsibilities of the Controller of Examinations include-

- a) Direct superintending control over the examination wing including examination sections, examination confidential wing, examination stores, examination computer section and records.

- b) Taking decisions on all matters related to examinations not falling within the powers of the statutory officers of the university.
- c) Making necessary arrangement for safe custody of files connected with the conduct of university examinations, documents, certificates etc. by the officers under whom such documents are kept.
- d) Taking special care to see that secrecy and confidentiality are kept in connection with all university examinations.
- e) Taking quick decisions as circumstances warrant with or without taking advices from subordinating officers.
- f) Exercising control over the space allotted for the examination wing including that for centralized valuation.

There is an office with sufficient staff assisting the controller of examinations in discharging his duties properly. These staff members function as per his directions and under his direct supervision.

Controller of examination functions from the headquarters. In each campus there is a Deputy Controller. Deputy Controller functions in consultation with the Controller of Examinations and he discharges the duties of the controller in each campus. There is an additional controller of examinations at the health sciences campus at Kochi.

Systematic evaluation process is supported by in-house ERP, Amrita University Management System (AUMS), which allows timely result publication within 10-12 days from the last day of the end semester examination. AUMS has an Academic Administration module which encompasses all aspects of evaluation like course registration, evaluation, grading, mark sheet and certificate generation.

Suggestions for improvement in the processes are gathered from the faculty as well as student representatives (during class committee meetings), and these are discussed for any improvements/reforms at the UGP or PGP committees, to then be forwarded to the academic council for approval.

The streamlining of operations has also included creation of flow charts and standard operation procedures/instructions for faculty and students. These are available with the academic coordinators of each school.

In each academic block a separate examinations office is allotted with adequate number of supporting staff members and faculty to monitor the distribution and collection of answer booklets.

The examinations office in each academic block is provided with transport facility to carry the answer booklets and question papers before the exam and carry away the answer booklets to the Controller of Examinations office immediately after the exam.

The answer scripts are distributed to the teachers for correction through the COE's office after the periodical tests. The end semester examination answer scripts are valued centrally in a few class rooms reserved for this purpose. As a rule, 10% of the corrected answer scripts are reviewed by other staff members for any totaling errors, or omission of marks, etc.

## Student Performance and Learning Outcomes

### Graduate Attributes

Graduate attributes identified by the university are academic rigor, ability to think critically and articulate clearly, capacity to collaborate and innovate to solve complex problems, capacity to cut across disciplines, and demonstration of ethical judgment and integrity.

The university has taken numerous measures to achieve the attributes listed above.

- Recruitment of well-qualified faculty, and regular faculty development programs in place
- Structured system for gathering feedback on student and teacher performance, and continuous monitoring to implement corrective measures and close the loop
- Comprehensive evaluation system to measure learning outcomes of each course for each student
- Holistic learning
  - Exposure to science subjects to generate interest in basic research
  - Exposure to the study of humanities for development of social perspective
  - Exposure to interdisciplinary subjects / research through projects and electives
  - Encouragement to participate in national / international competitive examinations like GRE, GMAT, CAT et to pursue higher studies
  - Student membership in professional societies like SAE, IEEE, ACM, SNAI etc
  - Pedagogical methods that help in developing communication skills and team work
  - Training in Soft skills
  - Provision to learn additional languages, both Indian and foreign
  - Provision to participate in various social, cultural, technical and other clubs, covering diverse interests
  - Inculcation of social responsibilities through provision of opportunities to participate in service activities such as NSS activities, Amala Bharatham, blood donation, and other extension programs
  - Exposure to value based education and personality development (Training in yoga & meditation, appreciation of cultural heritage and Indian contributions to science and technology, commitment to personal and professional discipline, etc.)

The course plans are designed to specify and deliver the learning outcomes. The teaching learning outcomes are also discussed during the class committee meetings. The learning outcomes of each program are discussed in the curriculum and syllabus book that are given to each student and faculty.

The university follows the strategy of continuous evaluation to ensure that the teaching and learning outcomes are met.

Based on the continuous evaluation consisting of periodical tests, quizzes, tutorials and assignments, the faculty members are able to evaluate the outcomes of the teaching learning process, and take appropriate and timely corrective actions.

Performance analysis is done to initiate accurate data-driven corrective actions.

Amrita is in the forefront of technology enhanced learning. The university has developed AVIEW Classroom, a framework that provides a rich interactive social environment for E-Learning. It is a simple, user friendly video conferencing system, which provides a great opportunity to a teacher to teach in a live interactive mode to various geographical locations across India. AVIEW Classroom provides opportunity to connect several universities together and creates a virtual world for students. It also acts as a Knowledge Cafe where students can discuss /chat about the lecture after the live class.

AMRITA has developed an integrated Amrita University Management System (AUMS) which has an e-learning platform Amrita Vidya, a web based software for effective management of learning services. It provides a platform to both faculty and students to upload learning resources, set up online submission of assignments, conduct tests, and monitor attendance and academic performance.

The e-learning studios in the campus enable students to attend lectures offered in other campuses / institutes. The class rooms are enabled with audio visual aids to show video lectures (NPTEL and others).

### **CRITERION III: RESEARCH, CONSULTANCY AND EXTENSION**

As per the assessment format, this criterion carries the maximum weight, and Amrita University gives commensurate importance to it, in numerous ways. This is one of the significant strengths of the university, as will be seen in the data provide below, as well as in the other components of the re-accreditation report (RAR). With a combined approach involving policies, organizational structure, and processes, the following values have been addressed, and continue to be addressed: Management's commitment to research, Empowerment of faculty for research, Social responsibility/serving the community, Timely administrative decisions in the research process, Sharing of knowledge of faculty (through various publications & consultancy), Interest in collaborations, Sensitizing towards social issues, and Active contribution towards extension.

- Right from its inception, the university has treated research as a very significant and essential activity. The research activities at AMRITA are directed towards societal, humanitarian and community development and relief.
- Many centres of excellence have been started in cutting-edge areas like Nanosciences Molecular Medicine, E-learning, Haptics, Biostatistics, Biomedical Engineering, Environmental Sciences, Virtual Labs, Wireless Networks Applications, Computational Engineering Networking, Cyber Security, Cancer, Educational Technologies, etc with the support of major national laboratories, industry leaders and agencies like TIFAC, DST, ICMR, ISRO, DRDO, DBT, DIT, DRDO, Microsoft, Hewlett Packard, Media Lab Asia, Infosys, MDS Pharma, Biocon etc.
- AMRITA is also a partner in the Indian governments Ministry of Human Resource Developments National Mission for Education using Information and Communication Technology (ICT) for various national projects in haptics, virtual labs, Educational Resource Planning, Natural Language Processing and interactive e-learning systems along with Indian Institutes of Technologies and Indian Institute of Science (IISc).
- The faculty of AMRITA has published more than 150 books, 300 book chapters and 3000 research papers in reputed international and national journals in the past ten years.
- AMRITA has attracted grants from various Governmental and private funding agencies to the tune of more than Rs. 180 crores in the past ten years.
- AMRITA has more than 100 major funded research projects with government and private agencies.
- AMRITA has also bagged or filed fifty major patents and inventions in the past few years which include Adaptive and Automatic Insulin Pump, Wireless Telematics, Virtual Private Network (VPN), Amrita Hospital Information System (AHIS) etc. Centralized patenting cell facilitates the process of applying for and tracking the patents.

#### **Promotion of Research**

The university has a Dean of Research, and each constituent school and university department has its own Research Committee. The committees serve to:

- process internal and external grant proposals,
- facilitate reviews for seed funding,
- communicate relevant calls for proposals and other research related information from the university management,
- maintain a database of research-related information and bio data of researchers, etc.
- prepares research brochure and handbooks

The committee members are appointed by the respective school heads. Within a school, the departments further have their own research coordinators, who work closely with the school-level research committee. Additionally, the Dean of PG Programmes provides oversight and management of the theses and dissertations, ensuring high standards and quality, as well as conformance to the rules and regulations laid down by the Academic Council.

The university has also established a Research Activities and Projects (RAP) committee that is responsible for the university level research administration, and ensures timely completion of grant applications, grant release, purchases, recruitment of research staff, review of research budgetary plans, signing of Memoranda of Understanding, etc. The university registrar, dean of research, and dean of PG Programs provide the main guidance and administrative leadership in the RAP.

A summary of the main activities and functional roles for the committee is given below.

❖ Centre for Funded Activities (C-Fact) collects research proposals from the faculty, formats the proposals for various funding agencies like DRDO, ISRO, DST, etc., and follows them up. This office monitors the progress of the work and submits all mandatory intermediate reports. A special officer is appointed for the purpose. The research committee of C-Fact consists of all vice-chairpersons of the departments besides the officer in charge. This committee also monitors the internationally funded research projects.

❖ Committee for Postgraduate Programmes (CPGP) to monitor and facilitate research activities and doctoral programmes. The CPGP comprises the Chairman, CPGP and Senior Professors of various departments and schools across campuses.

❖ For each Ph.D. candidate registered under AMRITA, a doctoral committee comprising a convener, thesis supervisor, co-supervisor (if any) and a faculty from the minor area is formed. This committee is responsible for all academic matters concerned with Ph.D. program of the research scholar including prescribing the courses, forming the comprehensive oral examination committees, monitoring the progress of the research scholar and suggesting panel of examiners for thesis evaluation.

❖ At the department level, in some departments, research groups are formed. Course allocation is based on the research group. Each research group is encouraged to generate at least one funded project in a year and each research group should conduct at least one workshop/conference in a year.

The following recommendations have been made by the research committees, and have led to significant beneficial impact:

- Introduce courses of special interest and benefit to researchers and research scholars (for e.g., Statistical Methods for Researchers, Research Methodology, Statistical Design of Experiments, Instrumental Methods of Analysis, etc.)
- Collect, and provide access to, the bio data of researchers – this is useful when collaborative efforts are initiated with government R&D labs or institutions abroad.
- Promote research by establishing contacts with leading industries and government organizations for funding.
- Gather and communicate the details of major conferences and call for research proposals.
- Publish regular updates on research activities – internally through email groups, and on the Amrita website.
- Arrange research retreat, where a significant portion of the research community of Amrita University, across all disciplines, can come together and learn about each other's work, and explore possibilities for collaborate interdisciplinary work.
- Arrange workshops/seminars on writing grant proposals.
- Establish a patent office to assist the researchers who file for patents.
- Set up a mechanism to facilitate consultancy by faculty, to industries and other organizations outside of Amrita.

### Research Policies

The following policies have been communicated and put into effect:

- All faculty members with the designation of assistant professor or above, to qualify for a promotion or increment, are required to show at least one SCOPUS indexed conference or journal publication EVERY YEAR since their previous promotion or increment.
- Monetary incentives are provided to faculty for publications in journals with high impact factors.
- Provision has been made to give study leave for Ph.D. thesis submission, sabbatical leave for higher studies, and travel grants for attending technical conferences.
- Seed money for research and organizing the conferences shall be provided, based on the specified submission and review process.
- The principal investigator (PI) is given autonomy on the utilization of the grant funds, and works in conjunction with university management for the use of the overhead charges. The PI, along with the research committee, ensure timely submission of progress reports and fund utilization certificates to the funding agencies, and support any audits required for the same.

### Promoting interdisciplinary research

\* between/among different departments /schools of the university :

This is one of the key strengths of Amrita University – as there is expertise in a wide range of areas including science, engineering, technology, management, medicine, humanities, biotechnology, arts, education, etc. A few examples are given below:

- Development of semi-automated low-cost insulin pump for diabetes patients – faculty from schools of engineering (chemical engineering,

electronics & communications engineering, computer science), biotechnology, and medicine.

- Development of special footwear for diabetes patients – faculty from schools of engineering (chemical engineering & materials science, mechanical engineering) and medicine.
- Development of blended learning models using ICT (Information & Communication Technologies) – faculty from schools of engineering (Computer Science, Chemical Engineering) and E-learning Research Lab.
- Development of haptics devices for vocation training, for women's empowerment – AMMACHI Labs & school of engineering (computer science, mechanical engineering).

\* [collaboration with national/international institutes / industries.](#)

A very short sample list is given below:

- Department of chemical engineering collaborating with the scientists from EPFL- Switzerland, and actively pursuing collaboration with IOCL for major funded applied research activities.
- EEE department collaborating with ICS Department, KTH Sweden on a DST-VINNOVA funded project; Collaboration with C-WET and IWTMA for a sponsored one year PG Diploma on Wind Resource Assessment and Wind Power Development for two years.
- Department of mechanical engineering collaborating with Robert Bosch Engineering & Business Solutions Ltd., Automotive Test Systems, L&T Valves, and Council of Scientific and Industrial Research – National Aerospace Laboratories

[Adjunct faculty and visiting professors of eminence](#)

Local Professors residing in India (Dr. RMVGK Rao) visit the campus once every year to share his expertise. Adjunct Professors from outside India visit the campus on their visits to India. Many other international researchers visit our campus and their visits are arranged by our International Office. The researchers apprise the faculty and scholars of the latest developments and give their guidance on different aspects of research.

[Research budget & budgetary plans](#)

[What percentage of the total budget is earmarked for research? Give details of heads of expenditure, financial allocation and actual utilization.](#)

Balance sheets will be made available to NAAC.

[Post Doctoral Fellowships/Research Associateships? If yes, provide details like number of students registered, funding by the university and other sources.](#)

Research fellows and research associates are hired for various funded projects, as per the approvals from the funding agencies. Amrita university supports the recruitment of additional research staff as well, based on the specific requirements.

[What percentage of faculty have utilized the sabbatical leave for pursuit of higher research in premier institutions within the country and abroad? How does the university monitor the output of these scholars?](#)

The output is judged by the number of publications by the concern faculty member during the period and the progress they make towards the submission of the final thesis.

National and international conferences organized by the university (highlighting the names of eminent scientists/scholars who participated in these events)

Provided in the evaluative reports of the departments.

#### Resource Mobilization for Research

Each department assists student research projects as appropriate, by sponsoring expenses related to consumables and services. For other exceptional cases, the student may request to school head, additional funding. The university provides seed funds to young researchers, and a process has been established for the same. For major research projects funded by external agencies, the university has provided substantial support by way of construction of facilities and amenities, equipments, human resources, etc.

#### On-going research projects of faculty

A partial list has been given in the Executive Summary section of the RAR, with some of the most notable projects undertaken by Amrita faculty. A full and detailed list is provided in the school-level evaluative reports.

Departments of the university recognized for their research activities by national / international agencies (UGC-SAP, CAS; Department with Potential for Excellence; DST-FIST; DBT, ICSSR, ICHR, ICPR, etc.) and what is the quantum of assistance received? Mention any two significant outcomes or breakthroughs achieved by this recognition.

The university has numerous projects funded by MHRD, DST, DBT, DRDO, ISRO, DIT, C-WET, etc. The full details are available in the Evaluative Report of the Departments.

A few examples are given below:

- Department of Sciences (Amrita School of Engineering, Amritapuri) has received funding for two projects from DST. (1) Amount 11,65,226 / - (Completed on 10.5.2012), (2) Amount 16,71,000/- (Completed on 12.12.2012)
- DST-FIST grant (Rs. 88, 00, 000) received by Amrita School of Biotechnology for purchase of equipments and infrastructure support and approved by TIFAC, Government of India as a centre of relevance and excellence (CORE) in Biomedical technology.
- “Development of a three-phase hybrid filtering system with digital control” with Dr. Manjula G. Nair as the Principal Investigator and Mr. K. Ilango as Co-Investigator – DST-SERC, MHRD, Government of India – Rs.19.5 Lakhs – 3 Years & 6 Months.
- Centre of Excellence in Computational Engineering and Networking
- Centre of Excellence in Cyber security
- Center for Excellence in Advanced Materials & Green Technologies

#### Research Facilities

What efforts have been made by the university to improve its infrastructure requirements to facilitate research? What strategies have been evolved to meet the needs of researchers in emerging disciplines?

Several inter-disciplinary centres of excellence in Nanosciences & Molecular Medicine, E-learning, Haptics, Biostatistics, Biomedical Engineering, Environmental Sciences, Virtual Labs, Wireless Networks & Applications, Computational Engineering & Networking, have been set up with facilities being used by faculty across various campuses and disciplines in the university.

Advanced laboratories set-up as part of the centres of excellence and research funded by national agencies like Landslide simulation laboratory (First of its kind in Asia), wireless sensor network laboratory, Cloud Security Laboratory, Cyber Physical Systems Security Laboratory, Ethical Hacking Laboratory, Multi-dimensional data analytics, Biometrics Laboratory etc

Industry sponsored labs in association with Agilent Technologies has set up a cutting-edge analytical centre named Amrita Agilent Analytical Research Centre at Biotechnology school, Amrita Cognizant Innovation Laboratory for Computer Vision & Image Processing , Microsoft sponsored embedded systems laboratory; Robert Bosch - Automotive Electronics Laboratory; Atmel Micro-controller Unit Lab etc at Amrita School of Engineering, Coimbatore

In the Department of Chemical Engineering and Materials Science four laboratories have been established to cater to the research requirements, the details of which are given below:

- **The Materials Chemistry and Research Laboratory** was inaugurated on 7th September 2009. This laboratory is a state-of-the-art facility and the first materials research laboratory on the Ettimadai campus. It has a variety of sophisticated equipment and synthesis and processing facilities for carrying out internationally competitive research in the fields of materials science and chemistry.

- **The Solar Energy and Optoelectronics Laboratory (SEOL)** was launched on 7th May 2011 at the Department of Chemical Engineering and Materials Sciences at Amrita Vishwa Vidyapeetham University through the generous support of Defence Research Development Organization (DRDO) extramural research. The main goal of the laboratory is to introduce new and innovative technologies in solar energy utilization and solve the current problems in solar cell technologies. Particularly, the synthesis and application studies of various nanomaterials for photocatalysis, gel electrolytes for charge storage applications. The synthesis and photophysical studies of organic and inorganic compounds for artificial photosynthesis applications are being conducted in SEOL currently.

- **The Nanoelectrochemistry Lab** was launched on the 24th October 12 at the Department of Chemical Engineering and Materials Science, with financial support from the Defence Research Development Organization (DRDO) and Amrita Vishwa Vidyapeetham. The objectives of the Nanoelectrochemistry lab are:

1. To develop new electrochemical synthesis strategies of advanced

materials such as nanocarbons, nanoscale and microscale geometries of metals and metal oxides

2. To employ electrochemical characterization techniques to examine electrical, electronic, and interfacial properties of advanced materials

3. To develop novel applications of electrochemically sensitive and active advanced materials such as:

a) Lead-free alloys and their electrodeposition process for microelectronic packaging

b) Highly sensitive and selective nonenzymatic electrochemical sensors for trace detection of a wide variety of analytes including pharmaceutical compounds, nutrients in food, pollutants such as heavy metals and organophosphorus compounds, and explosive substances

c) To develop new corrosion inhibition formulations of organic compounds

d) To develop high-performance materials for batteries

Equipped with state-of-the-art facilities for electrochemical analysis and preparation, the lab is actively involved in developing new materials, processes, technologies, and devices.

- **The Energy Systems and Process Integration Lab** was inaugurated on 24th October, 2012 at the Amrita Vishwa Vidyapeetham, Coimbatore campus. The objectives of this lab are process intensification and integration for energy sustainability and efficiency, processes and catalyst development for pyrolysis and gasification. The research projects that are being carried out in this lab are Novel integrated microchannel reactor/heat exchanger for highly exothermic reactions such as liquid fuel production from biomass and plastics, Novel catalysts for Fischer-Tropsch synthesis, use of efficient heat transfer systems in cogeneration, pressure swing adsorption to separate azeotropic mixtures, diesel desulfurization, Conversion of Benzene to food-grade hexane.

In the **Department of ECE**, a VLSI Laboratory is established at a cost of Rs.16.3 lakhs and a Bio-Medical Laboratory is being established at a cost of around Rs.10 lakhs to facilitate the research requirements.

In the **Department of Mechanical Engineering**, a Welding Research Lab and a Casting Research Lab has been set through funding from DST and AICTE.

The **Department of Sciences** has established a Biosensor Research Lab, with the focus on the development of techniques and materials for low-cost high-performance, multi-functional sensors and devices. The lab is in the process of developing low cost sensors for monitoring HbA1c, or glycated hemoglobin, also related to diabetes, as well as creatinine levels involved in the estimation of renal function. In addition, there is ongoing research for the development of sensors targeted at enabling early detection of cancers and genetic disorders, based on DNA and immunosensing principles. The high-tech lab is equipped with sophisticated instruments including an Atomic Force Microscope – AFM-STM (Park Systems, Korea), Electrochemical Workstation (CHI 660C, CH Instruments, Texas, USA), Electrochemical Analyser (CHI 608D spl), UV-Vis Spectrophotometer (Pharmaspec 1700, Shimadzu) and Biospectrometer (Eppendorf, Germany).

Does the university have a University Science Instrumentation Centre (USIC)? If yes, have the facilities been made available to research scholars? What is the funding allotted to USIC?

University Science Instrumentation Centres have already been set up at Amritapuri (Biotechnology), Cochin (Nanotechnology) and Coimbatore (Advanced materials and Green Technologies). As such, access to the facilities at each of these centers is available to the faculty/researchers in any of our campuses.

Does the university provide residential facilities (with computer and internet facilities) for research scholars, post-doctoral fellows, research associates, summer fellows of various academies and visiting scientists (national/international)?

Yes, University generously provides residential facility as well as Computer-internet facility to research scholars, research associates, Visiting Scientist and Academicians.

Does the university have centres of national and international recognition/repute? Give a brief description of how these facilities are made use of by researchers from other laboratories.

Yes. The centres of national and international recognition/repute are given below:

- Centre for Nanosciences and Molecular Medicine
- Centre for Wireless Networks and Applications
- Centre of Excellence in Computational Engineering and Networking
- Centre of Excellence in Cyber security
- Amrita E-learning Research Laboratory
- Centre for Biostatistics
- Cancer Centre
- Virtual Labs Research Centre
- Centre for Biomedical Engineering
- Centre for Environmental Studies
- Centre of Excellence in Cyber security Systems and Networks
- Centre for Research in Advanced Education Technologies
- Centre of Excellence in Cyber Security Systems and Networks
- AMMACHI Labs (Amrita Multi Modal Applications and Computer Human Interaction Labs)
- Centre for Clinical Trials
- Center for Excellence in Advanced Materials & Green Technologies

AMRITA's Centre for Nanosciences and Molecular Medicine is India's first centre focusing on the use of nanotechnology for biomedical and biotechnology applications. This centre is recognized today as a leader in Nanotechnology, Molecular medicine and Solar Cell research. The Centre also hosts a Nano Solar Centre for Excellence which focuses on innovative product development in photovoltaics and storage devices using nanomaterials, which are primarily aimed at solving energy problems. Another thrust is to develop nano-technology in biomedical implants and low-cost biomedical devices.

AMRITA Centre for Wireless Networks Applications has developed India's first-ever wireless sensor network system for predicting landslides at Munnar in Idukki district in Kerala. The system uses wireless sensor technology to provide advance warning of an impending landslide disaster, facilitating evacuation and disaster management. This system is being suitably modified to predict disease outbreaks, environmental pollution as well as other calamities. The Government of India has shown interest to deploy this system in all landslide prone areas including the Himalayas and the Konkan Region.

Another institutional research outreach programme is the Virtual Labs research centre, which focuses on intelligent development of virtual laboratories with state-of-the-art computer simulation technology to create real world environments and problem handling capabilities. This is required to bridge the gap between institutions or industries that retain the physical laboratory and distantly placed economically challenged educational institutions.

A research centre of AMRITA, supported by the United Nations (UN) is AMMACHI Labs (Amrita Multi Modal Applications Using Computer Human Interaction). This is a centre of technological innovation breaking new ground in the field of computer-human interaction, developing applications designed to improve quality of life for the least fortunate among us. Even as India's economy booms and the demand for skilled workers rise, vocational training in India is effectively paralyzed by social stigma, budget constraints and inadequate numbers of trainers and materials. The approach that AMMACHI Labs is taking to provide training is unique. It allows people from all walks of life especially women to get trained in various trades like plumbing, construction etc with proper application of modern technology. AMMACHI Labs aims to augment skill development and life enrichment education thereby contributing to women upliftment and empowerment.

In-house educational technology development cell, Centre for Research in Advanced Educational Technologies (CREATE) applies innovative digital solutions to provide accessible and affordable educational technologies and instructional software for primary and secondary schools as also builds solutions for universities with a focus on personalized assessment and learning like National faculty expertise system, computer-based medical simulation software, language learning using immersion and research grant management system. An intelligent tutoring and adaptive assessment program has been deployed in over 45 Indian schools in rural and small city neighborhoods. Indian Governments Central Board for Secondary Education (CBSE) has recommended the Online Labs (OLabs) for school experiments for all schools affiliated to this board, which is one of the largest in India.

Amrita Institute of Medical Sciences (AIMS) is a preferred location by multinational organizations to function as a centre in clinical trials. Numerous research protocols have been cleared/ongoing out of which around twenty are part of international clinical studies sponsored multinational pharmaceutical organizations. National organizations like ICMR, Department of Biotechnology, Department of Science and Technology and state level

organizations like Kerala State Council of Science, Technology and Environment, CUPRD, Cochin and State AIDS Control Society are currently supporting us in various research programs.

#### Research Publications and Awards

Does the university publish any research journal(s)? If yes, indicate the composition of the editorial board, editorial policies and state whether it/they is/are listed in any international database.

- Amrita Journal of Medicine.
- In-House research journals and working paper series are produced in medical, dental, and management schools.

#### Details of publications by the faculty

- \* Number of papers published in peer reviewed journals (national / international)
- \* Monographs
- \* Chapters in Books
- \* Books edited
- \* Books with ISBN with details of publishers

This has been provided in the evaluative reports of the departments (Part II of RAR). A summary with statistics consolidated for the university has been captured in the Executive Summary section of the RAR.

#### Give details of

- \* faculty serving on the editorial boards of national and international journals

Department of Electrical and Electronics Engineering			
Dr. K. K. Sasi	Member in Advisory Board		On line International Journal on Electrical Sciences, published by College of Engineering, Trivandrum, from Jan 2012 onwards
Dr. K. K. Sasi	reviewed papers	6	Elsevier journal: Energy-The International Journal
Dr. S. Balamurugan	served as Editorial Member		Journal of Electrical and Control Engineering
Dr. S. Balamurugan	reviewed papers	2	Karunya Journal of Research
Dr. S. Balamurugan	served as reviewer		Electrical Power Components and Systems, Taylor and Francis Journal
ECE			
Mr. Mohankumar			International journal of VLSI design &

		Communication Systems	
Dr. E.P. Sumesh		Procedia Engineering published by Elsevier	
Dr. E.P. Sumesh		Special Issue in Telecommunication Systems- Springer	
ASCOM			
Dr. A. Balasubramanian	Editorial Board Member	Blue Ocean Research Journal	
Dr. A. Balasubramanian	Reviewer	“The Fourth International Conference on Digital Information Processing and Communications (ICDIPC2014)”, Asia Pacific University of Technology and Innovation (APU), Kuala Lumpur, Malaysia.	
Dr. P. Subramaniam	Appointed as Advisory Committee member	Loyola College’s research Institute “People Studies”	focuses on people oriented research projects
Dr. Kalyani Suresh	Member – PhD Intake Approval Committee	Bharatiyar University- 2012	
Dr. K.B. Anand	Reviewer	Journal of Materials in Civil Engineering, American Society for Civil Engineers.	
Dr. K.M. Mini	Reviewer	Journal of Structural Engineering and Mechanics, Technopress	
Dr. K.M. Mini	Reviewer	Journal of Irrigation Engineering, American Society for Civil Engineers.	
Mechanical Engineering			
Dr. K. Rameshkumar	Guest Editors	“Simulation and Optimisation in Manufacturing Systems and Supply Chains”	

Dr. S.P. Anbuudayasankar	EDITOR-IN-CHIEF	International Journal of Decision Making in Supply Chain and Logistics (IJDMSC)	International Science Press, Serial Publications
Dr. S.P. Anbuudayasankar	MANAGING EDITOR	International Journal of Green Computing (IJGC), IGI	Global Publishers
Dr. S.P. Anbuudayasankar	ASSOCIATE EDITOR	International Journal of Logistics Economics and Globalisation (IJLEG),	Inderscience Publishers
Dr. S.P. Anbuudayasankar	ASSOCIATE EDITOR	International Journal of System Dynamics (IJS),	IGI – Global Publishers
Dr. S.P. Anbuudayasankar	ASSOCIATE EDITOR	International Journal of Operations, Systems and Human Resource Management (IJOSHRM),	International Science Press, Serial Publications
Dr. S.P. Anbuudayasankar	GUEST EDITOR	International Journal of Enterprise Network Management (IJENM)	SPECIAL ISSUES Interscience Publishers (Scopus Indexed)
Dr. S.P. Anbuudayasankar	GUEST EDITOR	“Data Analytics Techniques and Heuristics for Complex Supply Chain Network Problems”	Special Issue on ; Vol.3, Issue 3, 2009
Dr. S.P. Anbuudayasankar	Guest Editors	“Simulation and Optimisation in Manufacturing Systems and Supply Chains”	KRK also
Dr. S.P. Anbuudayasankar		International Journal of Value Chain Management (IJVCM),	Inderscience Publishers (Scopus Indexed)
Dr. S.P. Anbuudayasankar		"Empirical, Experimental, Exploratory and Analytical Research for the Smarter Supply Chain – Service and	Special Issue

			Manufacturing Industry"	
Dr. Anbuudayasankar	S.P.	REFEREE & EDITORIAL BOARD	European Journal of Operational Research (EJOR)	Elsevier Publishers
Dr. Anbuudayasankar	S.P.	REFEREE & EDITORIAL BOARD	OMEGA – The Journal of Management Science	
Dr. Anbuudayasankar	S.P.	REFEREE & EDITORIAL BOARD	International Journal of Systems Sciences (IJSS)	Taylor and Francis Publishers
Dr. Anbuudayasankar	S.P.	REFEREE & EDITORIAL BOARD	International Journal of Logistics Economics and Globalisation (IJLEG)	Inderscience Publishers
Dr. Anbuudayasankar	S.P.	REFEREE & EDITORIAL BOARD	International Journal of System Dynamics and Application (IJSDA)	IGI Global Publishers

\* faculty serving as members of steering committees of international conferences recognized by reputed organizations / societies

Chemical				
Prof. R. Subba Rao				
Dr. S.S. Bhagawan				
Dr. Devanathan	Sriram	Chairman, IChE Chapter of Coimbatore Region		
Dr. Jayanarayanan	K.			
Civil				
Dr. K.M.Mini		Expert member- Civil Engg.	faculty selection Committee – Karunya University, Coimbatore	
EEE				
Mr. N. Prakash	Krishna	served as Screening Committee member	IEEE R10 All India Young Engineers Humanitarian Challenge AIYEHum 2012	December 2012 organized by IEEE Bangalore section
Dr. K.K. Sasi		served as member of Organizing	3 <sup>rd</sup> International conference and exhibition – WE	IWPA and WWEA, Coimbatore

	committee	20 by 2020	
Mr. Selvakumar	served as member of Organizing committee	3 <sup>rd</sup> International conference and exhibition – WE 20 by 2020	IWPA and WWEA, Coimbatore
Dr. K. K. Sasi	Chaired a session	National Seminar on Total Power Quality Management	22 May 2012, organized by FICCI, Coimbatore
<b>Mechanical Engineering</b>			
Dr. S.P. Anbuudayasankar	Session Chairman of a technical session	International Conference at Noorul Islam University, Nagercoil	April 10 and 11, 2012
Dr. S.P. Anbuudayasankar	Session Chairman of a technical session	Technical Symposium at Sri Krishna Engineering College, Coimbatore	02-03-2012
Dr. S.P. Anbuudayasankar	Chairman	Technical Symposium at SNS College of Technology, Coimbatore	02-03-2012
Dr. S.P. Anbuudayasankar	Coordinator	Second International conference on Simulation Modeling and Analysis (COSMA 2011)	Amrita School of Engineering, Amrita Vishwa Vidyapeetham, Coimbatore - 641 112 during 14th to 16th December 2011
Dr. S.P. Anbuudayasankar	chaired two technical sessions	COSMA 2011	
Dr. S.P. Anbuudayasankar	SESSION CHAIR	International conference on Recent Advances in Mechanical Engineering (ICRAME-2010)	
Dr. S.P. Anbuudayasankar	Session chair	Noorul Islam University campus, Kumaracoil, Kanyakumari	8 & 9 April 2010 at , Tamil Nadu, India.
Dr. S.P. Anbuudayasankar	Session chair	Oxford Engineering	23rd February 2007

		Colege, Toruchirappalli OXCEM-2K7	
--	--	---	--

### ECE

S.no	Name	ICCTD '2011 Committee
1	V.P. Mohandas	General chair
2	R. Sundararajan	Co-chair
3	E.P. Sumesh	Convener
4	Dr. N. Madhumohan	Organizing secretary
5	R. Vidhyalavanya	Secretary
6	N. Mohankumar	Secretary
7	R. Ramanathan	Treasurer
8	Dr. M. Jayakumar	Program committee
9	Dr. M. Nirmala Devi	Program committee

#### Organizing secretary

- ICCTD '2011 – Dr. E.P. Sumesh
- RTCSP '2010 – Dr. M. Jayakumar
- RTCSP '2013- Dr. M. Jayakumar

#### Technical Committee

✓ N. Mohan Kumar served as Technical Committee member for the following:

- (i) 2010 2<sup>nd</sup> International Congress on Engg education, Dec 8-9, 2010, Kualalumpur
- (ii) VLSI Design and test symposium 2011
- (iii) International conference on Informatics Engg & Information Science, Nov 14-16, 2011, Kualalumpur
- (iv) ICEDSA, Apr 25-27, 2011, Kualalumpur

✓ IEEE Transactions on Electromagnetic Compatibility – Sabarish Narayanan B-Reviewer

✓ Dr. S. Veni served as Technical Committee member for the following:

- (i) International conference on Machine Vision and Image Processing (MVIP12) organized by Department of Instrumentation and Control Systems Engineering, PSG College of Technology on December 14 & 15, 2012
- (ii) International Conference of Women in Computing (AICWIC 2013) between January 9 and 11, 2013 at Amrita Vishwa Vidya Peetham, Coimbatore
- (iii) National Conference on “Recent trends in Electronics and Communication Engineering” on 7.03.2012 at Ranganathan College of Engineering, Thondamuthur, Coimbatore – 641 109.

(iv) International conference on Machine Vision and Image Processing (MVIP12) is organized by Department of Instrumentation and Control Systems Engineering, PSG College of Technology on December 14 & 15, 2012

**MSW-** Dr. K R Priya is serving as a committee member for the following two journals

1. ‘Asian Journal of Development Matters’ (print and Online ISSN).
2. Afro Asian Journal of Anthropology and Social Policy (Online ISSN)

#### Research awards received by students

- C. Raja Sundar, M. Aravind and B. Arun of IV Year B.Tech. Polymer Engineering (2006-2010), were awarded silver medal in Chemical Engineering discipline for their project, “Design and Fabrication of a Spin Coater Machine for Thin Film Coating and its potential Applications” in the 40<sup>th</sup> All India Student Design Competition by National Design Research Forum, Bangalore, on November 1st, 2009.
- Amruthalakshmi V., Mythreyi Unni, Santhosh N. and Dharini S. (IV Year BTech Chem. Engg., 2009-2013), won the first prize in TITANS of INNOVATION competition held by Jan 21st, 2013
- Mythreyi Unni, Santhosh N. and Dharini S. (IV Year BTech Chem. Engg., 2009-2013), won the 2<sup>nd</sup> Prize in Youth Innovation Choice Competition (YICC 2013) conducted by ICT Mumbai on Jan 8-11, 2013
- Two students secured the Second prize for the Best Research Paper Award at the ICMR sponsored National Conference on *Management of Alzheimer’s Disease – Role of Herbal Pharmecotherapy* conducted by Sharada Vilas College of Pharmacy, Mysore.
- Rijo John , M.Pharm Pharmaceutics got the best paper award for the oral presentation at IPC (Indian Pharmaceutical Congress), conducted at SRM University , Chennai.
- Tintu Sara James, 2010-12 batch M.Pharm Pharmacy Practice student of Amrita School of Pharmacy won the First prize for oral (Podium) presentation in the 7th Asian conference on Pharmacoepidemiology held at hotel Sheration in Bangalore during 26th -29th October 2012.

S. No.	Name of Student	Award Recognition / (Details)	Awarding Organization	Brief Highlights
1.	Anand Kumar	Scholarship to pursue MSc in Materials Chemistry & Nanotechnology	Chalmers University, Gothenburg, Sweden	Emphasis is on synthesis, chemical characterisation, physical & chemical properties, & applications, and top-down chemical nano manufacturing
2.	Mukund Rao	Scholarship to pursue MA in Climate and Society	Columbia University, New York	The highlight of the course is inter-disciplinary approach needed to solve humanity’s problems today
3.	Rohit Satish	Scholarship to pursue PhD in Chemical Engineering	Nanyang Technological University, Singapore	Research in Solar Cells

\* national and international recognition received by the faculty from reputed professional bodies and agencies

- Dr. Bipin Nair has been selected as a member of the BioCARE , an

initiative of DBT, India. He is also selected as a member of the governing body of NCCS, Pune.

- Dr. Sandhya Joshi was on the team of peer reviewers for two IEEE International conferences (on Machine Learning and Computing and Computer Science and IT) and 2nd International Conference on Electronics and Optoelectronics.
- Dr. Kalyani Suresh of ASCOM has been chosen as the 'Best Professor Teaching Advertising Management' by the National B-School Awards 2013.
- Dr. P.S. Chandramohan Nair
  - Prof K.M. Bahauddin Award for 'The Distinguished Engineering Teacher Of Kerala 2012'
  - Kerala State Energy Conservation Award 2011 in the category of 'Research & Innovation'
  - Marquis Who's Who In The World Publications
  - Award Of Excellence For The Excellent Performance during the Academic Year 2011-2012
- Dr. P. Kanakasabapathy
  - Marquis Who's Who In The World Publications from 2011 onwards
  - Certificate Of Excellence In Recognition To The Contribution As Remote Center Co-Ordinator in the ISTE Workshop conducted by IIT, Bombay held on December 2011
  - Certificate Of Excellence In Recognition To The Contribution As Workshop Co-Ordinator in the ISTE Workshop conducted by IIT, Bombay held on December 2011
- Sruthy V.
  - Certificate Of Excellence For Excellent Performance in the ISTE Workshop conducted by IIT, Bombay held on December 2011
- Arun Rajendran
  - Certificate Of Excellence For Excellent Performance in the ISTE Workshop conducted by IIT, Bombay held on December 2011
- Amritha S.
  - Certificate Of Excellence For Excellent Performance in the ISTE Workshop conducted by IIT, Bombay held on December 2011
  - Best Paper Award for the paper titled 'Reentry Guidance For Reusable Launch Vehicle Using Non Linear Tracking'
- Jayasree P.R.
  - Certificate Of Excellence For Excellent Performance in the ISTE Workshop conducted by IIT, BOMBAY held on DECEMBER 2011
- Srikanth Vasudevan Pillai
  - Certificate of Appreciation from Amrita university - 2012-2013 academic year ( campus level)
  - Outstanding SB Chapters Area Chair - in recognition to the activity in the year 2012, IEEE- IAS Chapters and Memberships Development Department at IAS Annual Meeting, Las Vegas, NV, USA ( international level)
  - IEEE- IAS SB Development Committee Chair from 2013 onward ( international level)
  - IEEE IAS SB Chapters Area Chair R-10 (Asia and Pacific) from

- 2012 onward (international level)
- IEEE -IAS Student Branch Chapter of RIT kottayam honoured " Outstanding IEEE IAS Volunteer Award 2012 " ( RIT Chapter)
- IEEE-IA/IE/PEL Jt. Chapter Kerala Section Secretary from 2013 onward ( Kerala Section)
- The biographical profile of Dr. Shikha Tripathi, Chair-ECE, Dr. K.V. Nagaraja, Professor, Department of Mathematics and Dr. B. Venkatesh, HoD-Mathematics have been included in the 2010 edition of "Who's Who in the World?". This new edition will feature biographies of more than 50,000 of the most accomplished men & women around the globe and across all fields.
- Articles published by Dr. K.V. Nagaraja and Dr. B. Venkatesh faculty from the Department of Mathematics in reputed journals have crossed 50 citations (other than self citations).
- Dr. T.S.B. Sudarshan has been selected for fellowship with the 'Applied Innovation Institute', San Francisco, USA. This fellowship is to enable him work in Innovation and Entrepreneurship Research with other fellow members of Applied Innovation Institute for a period of one year.
- Dr. T.S.B. Sudarshan has been invited to be the Distinguished Member of the Advisory Board of Department of Computer Science and Engineering, M.S. Ramaiah Institute of Technology, Bangalore.
- Karthigha Balamurugan, M. Nirmala Devi and M. Jayakumar "Roadmap to the modelling approach and design of RF CMOS devices", 2nd Amrita International Conference on Women in Computing (AICWIC – 2013), Jan 9-11,2013 and its proceedings is available in IJCA. (Won BEST paper award)
- International Biographical Centre, Cambridge, England has included in the prestigious publication "2000 Outstanding Intellectuals of the 21<sup>st</sup> Century – 2011".
- Dr. Kalyani Suresh of ASCOM has been chooses as the 'Best Professor Teaching Advertising Management' by the National B-School Awards 2013.
- Dr. S.P. Anbuudayasankar was awarded Best thesis award by PIMG, Gwalior, on 29/12/2012.
- Dr. C. Shunmuga Velayutham, Associate professor of CSE department has received the Best Faculty Award for the year 2010, an award instituted by Cognizant Technology Solutions, India.
- Prof. P.N. Kumar has won the Best Paper Award for the work Financial Market Analysis of Bombay Stock Exchange using an Agent Based Model in 2010 IEEE International Conference on Computational Intelligence and Computing research conducted on Dec 28-29,2010
- K. Abirami has won the Best paper award for presenting the paper "Peer to Peer File Sharing Using IRM" in the National Conference on Computer Science and Informatics (NCCSI'12) on 23<sup>rd</sup> and 24<sup>th</sup> April 2012.
- G. Jeyakumar, Asst. Professor and Dr. C. Shunmuga Velayutham, Asst. Professor have won the Best Paper Award under Optimization Track in the International Conference on Intelligent Agents and Multi-Agent

Systems (IEEE Catalog Number: CFP0953h-DVD, ISBN: 978-1-4244-4711-4) conducted on 22-24, July 2009

- Prof. P.N. Kumar, Rahul Seshadri G., Hariharan A., V.P. Mohandas, P. Balasubramanian has won the Best Paper Award presented a paper on “Agent based Modeling of Financial Markets” in the IEEE International Conference on Computational Intelligence and Computing Research, 2010
- Dr. B. Ranganathan, Assoc. Professor, Dept. Of Pharmaceutical Chemistry won the best oral presentation award in the 1<sup>st</sup> Annual National Convention of Association of Pharmacy Professionals (APP) at Bhopal, M.P., on April 7th 2012 for his talk titled Design, synthesis and biological evaluation of some novel chalcone derivatives as anti-inflammatory agents in the Pharmaceutical Chemistry section and attended by about 100 delegates from many parts of India.
- Dr. S.P. Anbuudayasankar, Best thesis award, from PIMG, Gwalior on 29/12/2012.
- Two of the school’s faculty members Dr. Sudhakar Achath (2009) and Dr. R.G. Priyadarshini (2012) received the prestigious Dewang Mehta Award for Teaching Excellence in the last five years.
- Dr. Achath was also awarded with the AIMS International Distinguished Service Award, 2010 at the Eighth International AIMS Conference held at IIM Ahmedabad.
- Dr. R.G. Priyadarshini was also awarded “Best Net Teacher Award” by Confederation of Indian Industry (CII) for her dedicated efforts towards Yi (Young Indians) activities for the year 2011 – 2012.
- Dr. Mridula Sahay, Associate Professor, was honoured with “Bharat Jyoti Award” for exemplary services in the education sector by India International Friendship Society, 2012 and Best Citizens of India Award by Best Citizen Publishing house, 2012.
- The textbook written by Prof. Shobhana Madhavan in the area of ‘Cross Cultural Management’ was used as a textbook for a course in the same area at IIM Bangalore. Oxford University Press, a leading publisher of Management books has expressed their desire to include many of the cases that Prof. Madhavan developed for this book in a separate case series being planned by them.
- Dr. Rajiv Prasad was hired as an academic consultant by the Vancouver, Canada based Commonwealth of Learning to develop the course material for the ‘Business Ethics’ course for their EMBA programme in the year 2012. Commonwealth of Learning was started as a joint initiative by the governments of Commonwealth nations to promote education among the poorer commonwealth countries. This EMBA Programme is offered to the working Executives in almost ten countries by the Commonwealth of Learning.
- Dr. Sanjay Banerji, Ex-Dean and currently Professor Emeritus, was invited to join the panel of experts as a speaker on the topic “Developing Management Education to Make Organizations Competitive” during the annual Industry-Institute Interface Day organized by GRG School of Management Studies, Coimbatore on 20<sup>th</sup> Dec. 2008.

- Dr. Sudhakar Menon Achath, Professor, was invited as a Chief Guest for the Intercollegiate meet 'MAGWHIG' '09 organised by the Business Management Department, Sree Narayana Guru College, Chavadi, Coimbatore on 5<sup>th</sup> January '09. He spoke about the need for cross-functional integration in Management Education.
- Dr. R.G. Priyadarshini, Associate Professor, spoke on invitation at a programme organized by Coimbatore Management Association (CMA) called 'Monday Musings'. She spoke on the topic 'Good to Great' on 25/1/2010.
- Dr. Sanjay Banerji, Professor emeritus was invited by MDH Vasteras, Sweden to talk on Project Management on 23-2-2010 through internet.
- Dr. Sanjay Banerji, Professor Emeritus, was invited as a Session Chair at the International Conference on Business Management & Information System held at Seminar hall, Singapore Management University, Singapore on November 22-24, 2012.
- Dr. Sudhakar Achath was invited to be the Session Chair for the Session WD04: Applications of Dynamic Programming and Control, at the 2012 Annual Meeting of the INFORMS, on 17<sup>th</sup> October 2012, at Phoenix, Arizona, USA.
- Prof. Shobhana Madhavan was invited to conduct a session on "Cross-cultural Communication Challenges" by CIRCOR International, Coimbatore on 3 December 2012.
- Dr. Mridula Sahay coordinated the International Conference on "Sustainable Development & Governance: Building commerce and Communities" held jointly by Amrita School of Business, Coimbatore, Deakin University Australia, Sustain Group, Australia and UN Global Compact from 11-13 December, 2012
- Prof. Shobhana Madhavan was invited to a Youth Leadership Summit organized by Shanti Ashram, a NGO and addressed over 100 youth leaders on the topic of 'Active Citizenship' on 30 January 2013
- Prof. Shobhana Madhavan and Dr. Deepak Gupta organized an NGO Summit as part of the Amrita-Deakin Sustainable Development Conference on 14 December 2012. The theme of the NGO Summit was "Scaling up Sustainability Initiatives - Issues and Challenges Faced". NGO leaders from USA, Hyderabad, Coimbatore, Pollachi, Orissa, and Bangalore participated in the Summit.
- Dr. Hardik Vachhrajani presented paper in 3rd International Conference on "Business Ethics, Governance and Sustainable Enterprises", Ahmedabad, India, 8-9/February/2013, Received Best Paper Award, Proceedings published by GTU, as special issue of Sankalpa, Journal of Management and Research Vol 1. No. 3
- Dr. Hardik Vachhrajani was appointed to the editorial board of the prestigious International Journal of Information Systems and Social Change published by IGI Global.
- Dr. Hardik Vachhrajani was awarded 'Young Teacher for the Year 2010-2011' by Higher Education forum, Mumbai for his outstanding contribution to the profession of teaching. The following awards are received by Dr. M. Nirmala Devi (ECE Department, Coimbatore)

- International Biographical Centre, Cambridge, England has included in the prestigious publication “2000 Outstanding Intellectuals of the 21<sup>st</sup> Century – 2011”.
- Marquis “Who’s Who in the World” - inclusion in the publication in 2011 (28<sup>th</sup> Edition).

S. No.	Name and Designation of the Staff member	Name of the Award / Recognition received	Name of the Agency	Month & Year of receiving the award / recognition
1.	Prof. R. Subba Rao	Member of expert committee	AICTE for the inspection of Institute of Chemical Technology, University of Mumbai for the accreditation of M.Tech program (Polymer Engg. and Tech.).	2008
2.	Dr. S. Ramachandran	Member, Board of Studies for M.Tech Nano Technology	Anna University, Coimbatore.	2008
3	Dr. S. Ramachandran	Member, Doctoral Committee	Anna University, Coimbatore.	2008
4	Dr. S. S. Bhagawan	Chairman, Ph D Adjudication Board [Chemical Sciences]	M.G. University, Kottayam	February 2009
5	Dr. S. S. Bhagawan	External Expert – Committee for Selection of Colleges with potential for excellence	Mahatma Gandhi University, Kottayam	January 2009
6	Prof. R. Subba Rao	FELLOW of Indian Plastics Institution	Indian Plastics Institution	14 <sup>th</sup> June, 2010
7	Dr. Murali Rangarajan	Doctoral Committee Member for 2 candidates	Anna University, Coimbatore	2010
8	Dr. Murali Rangarajan	Member of Board of Studies, Department of Chemical	Adhiyamaan College of Engineering, Hosur	2010

		Engineering,		
9	Dr. Sriram Devanathan	Elected as President, Coimbatore Chapter of IChE	Indian Institute of Chemical Engineers	June 2013
10	Dr. Udaya Bhaskar Reddy, Assistant Professor	ESEC Distinguished Alumnus Award	Erode Sengunthar Engineering College, Thudupathi, Erode	February 23rd 2013

S. No.	Name and Designation of the Staff member	Name of the Award / Recognition received	Name of the Agency	Month & Year of receiving the award / recognition
1.	Dr. Amalendu Jyotishi	VKRV Rao Memorial Award	Institute for Social and Economic Change	20 <sup>th</sup> January 2011 for Best PhD Thesis in Economics produced during the period 2005-10.
2.	Dr. Deepika MG	First Prize for Best Case Writing Award	Dhruva International case writing competition Dec 2012	December 2012/ Certificate+Cash award of Rs.20,000/-

What is the official policy of the university to check malpractices and plagiarism in research? Mention the number of plagiarism cases reported and action taken.

Faculty members who wish to claim credit for their publication(s) have to please fill up the prescribed form in hard copy and get it countersigned by the HOD before submitting it. Faculty members and research scholars have been directed to perform a plagiarism check, with a set of tools prescribed, to ensure authenticity of the publication.

Has the university instituted any research awards? If yes, list the awards.

The University has instituted the Amrita-TIDE innovation award program, sponsored by Department of Electronics and Information Technology (DeitY), Govt. of India., to make its students well equipped with all pertinent skill sets

to solve every day challenges with environmentally friendly techniques and a business edge.

#### Incentives given to the faculty for receiving state, national and international recognition for research contributions

- Faculty members receive attractive incentives for publishing their research work in national / international journals, based on the impact factor of the journals.
- Award of excellence and appreciation given to many faculty members every year for recognizing their contributions.
- University provides a cash award of Rs.7500 for authors of SCOPUS indexed Journal / Conference publications.
- Faculty members get performance points in the annual Performance Management Review for getting their work published in good peer reviewed journals. Every full time faculty member is required to earn at least three hundred points every year. For accumulating points above three hundred through teaching, research contributions or discharging administrative responsibilities, they receive annual bonus in cash.

#### Consultancy

- The university does publish the expertise available for consultancy services through its web site. The web page of each discipline/department lists the expertise available, potential for consultancy services. In addition to this, various university brochures also publish the consultancy services.
- The university allows faculty to provide consultancy to industries and other organizations. Each department/research center plans on the level and permissible hours & terms, based on the requirements for teaching and other in-house duties for each faculty member.
- Directorate of Corporate & Industry Relations (CIR) with centres in all campuses focusing on meeting requirements of students from diverse disciplines for building competencies in domain areas as well as in life skills. CIR focuses on Learning and Development, Corporate Relations, Career Facilitation, Entrepreneurship Development, Alumni Networking, Corporate Communication and Corporate Training.
- CIR facilitates initial contact, terms of consultancy, signing of MoUs, and long term relations with industries. They are strongly focused on promoting the industry-academia relations via tie-ups leading to various activities: internships, curricular projects in industry, expert lectures from Amrita at industries, expert lectures by industry personnel at Amrita, placement activities, curricular design alignment based on industrial needs, etc.
- **Note:** A separate detailed report from the CIR department is available upon request.

#### How does the university utilize the expertise of its faculty with regard to consultancy services?

The department of Corporate & Industrial Relations (CIR) acts as a liaison in matching the expertise of the faculty to the consulting organization's specific requirements. A few examples are given below.

- Dr. Praveen Patkar is a consultant in different community development projects also expert in women trafficking, child rights, and other social issues
- Dr. K.R. Priya was a consultant for a major project of UNDP on “Bio-reserve conservation and landscaping” at Western Ghats Kerala.

List the broad areas of consultancy services provided by the university and the revenue generated during the last four years.

A sample of the areas of consultancy services provided is as follows: social impact assessment, quality management, materials testing, environmental and social impact assessment, community development, women’s empowerment, and design of biomedical devices.

#### Extension Activities and Institutional Social Responsibility (ISR)

To inculcate social responsibilities the faculty and students are encouraged to participate in service activities such as:

- National Service Scheme (NSS) activities
- Amala Bharatham Cleanup Drive (ABCD)
- Youth Red Cross (YRC) and Blood donation drives and camps
- Orphanage visits,
- Tree plantation,
- Organ donation pledge etc
- Collection of old cloths for the poor
- Supply of free stationary materials to poor children, and
- Extension programs

There have been opportunities galore for students to demonstrate their social commitment and community engagement. AMRITA students have actively participated in disaster relief and rehabilitation activities after the Gujarat Earthquake in 2001; Tsunami relief operations in Tamil Nadu and Kerala in 2005-2006, flood relief operations in Bihar in 2009 and Karnataka in 2010. Since 2010, AMRITA students in all campuses have played an active role in the Amala Bharatham – Clean India awareness drive and campaigns in their communities as well as wholeheartedly participating in the cleaning of the Sabarimalai pilgrimage site before and after the pilgrimage season.

Centre for Environmental Studies, Green Friends and Nature Clubs are engaged in tree planting, forest protection, liquid and solid waste management, vermicomposting, medicinal plant cultivation and afforestation activities with active involvement of students. In the Coimbatore campus, by the year 2010 about 1 lakh of trees belonging to 210 species were planted in the campus and the UNEP (United Nations Environmental Programme) issued to the Centre an appreciation certificate for this achievement as a part of the 1 billion tree planting programme. Around 13 lakh liters of waste water released everyday from hostels, residences, canteens and other sources are fully recycled through bio-remediation and utilized for a horticulture and gardening.

Various students clubs and organizations focused on social awareness and community engagement like Amrita Sanjeevani, Amrita Prakrithi

Samrakshana Samit (Nature club), Green Friends, Amrita Blood Collectors and Donors (ABCD) Forum, Anti-Tobacco Movement at Amrita (ATMA) etc

Students in the health science campus are given the opportunity to participate in various medical, dental and special camps like cleft lip organized by the university in various locations as well participate in camps at sites of disaster relief and rehabilitation like Tsunami. Annually over 150 camps are being organized.

- The curriculum is designed to develop Environmental commitment and awareness towards sustainable development and efficient use of resources some of which are listed below.

a) Energy conservation :

- Regular Awareness campaigns
- Planned power shutdowns in hostels during periods of low occupancy.
- Phasing out of incandescent lamps and partial phasing out tube-lights in favor of CFLs.
- Minimizing of air conditioner use through management controls

b) Use of renewable energy

See use of firewood below

c) Water harvesting :

- Seepage pits near the academic blocks to collect roof drainage.
- Large scale tree plantation has improved ground percolation of rainwater.
- Partial terracing of the land has reduced surface runoff.

d) Check dam construction

- Several check dams have been constructed on streams originating in the neighboring mountain. There are periodically desilted and maintained.

e) Efforts for Carbon neutrality

- Large scale tree plantations within campus and in neighboring village
- Use of firewood for part of the kitchen boiler heating needs (campus grown wood is carbon neutral)

f) Plantation

Please See above

g) Hazardous waste management

- The only hazardous waste that we generate are from the chemicals that are generated during the regular lab experiments involving the ordinary chemicals used in the UG studies. These chemicals are collected in separate containers and discharged at the engineered land sites.

h) e-waste management

- Collection, segregation and sale to buyers in the city.
- We are also planning to recover the precious metals (mixed metals without separating them into individual metals) from the PCBs (E-Wastes) and convert them into jewellery using the skills of the local artisans. This process will involve minimum consumption of energy, minimum generation of chemical wastes, minimum capital investment and use of locally and abundantly available skills of the artisans. We are also planning to convert this mixed metal waste in to coins (monetary instruments) so that all the governments all over the world can use this application for the conversion of

the mixed metals recovered from the PCBs with minimum environmental impacts.

- i) Preserving local plant biodiversity
- j) Creating awareness about local plant biodiversity
- k) ETPs and use of reclaimed water for gardening.
- l) Minimal pesticide and agrochemical use on campus.

### Promoting university-neighborhood network & student engagement, and contributing to the holistic development of students and sustained community development

- Service to society is an important component of education at the Amrita. Through the Amala Bharatham Campaign (ABC) the students spread the awareness of “Clean India” to the people in the neighborhood of the campus. This has led to a litter free campus. The message is also spread to the school children in the neighboring schools. ABC is a cleanliness drive to raise social awareness of humanity’s debt to our beautiful Earth and nature. The thrust is on the need for people, government and organizations to join hands in keeping the surroundings clean.
- “Green Friends” is a nature club working with a vision to instill among the youth the love of plants and animals. This develops respect for nature. All these contribute to the holistic development of the students along with the development of the community around them.
- Students are taken to nearby slums where ‘Annadanam’ is organized in order to sensitize the student community to the problems faced by the people residing in such places. Students were encouraged to take coaching classes for such children thereby instilling in them the desire to share & help the needy. Students have made a documentary on the lives of slum dwellers near the college campus.
- The students and faculty are engaged in outreach programs in villages around the campus. They participate in several activities like Amala Bharatham cleaning drive, tree plantation campaigns, providing books and learning materials to students.
- Conducting dental treatment camps in various remote places and tribal areas, school health camps for school children, visits to orphanages and tribal areas, old age homes etc. The students take classes on health issues during the camps and address their questions regarding health issues.
- Cloth donation and visiting old age and orphanage homes.
- Educating village students about computers and conducting spoken English classes.
- The community Health Medicine Department of Amrita Institute of Medical Sciences adopted two areas in the community. The adopted areas include the Njarakkal Panchayat and Kaloor. The students of College of Nursing gain experience from the same centres.
- Students visited the tribal village in Wayanad and conducted health survey and health check up for about 30 families of four colonies. Major problems identified were alcoholism and substance abuse, hypertension, endocrine disorders and lack of personal hygiene. Health awareness programme was also organized on the problems identified using various methods including street and role plays.

- Observation visits were arranged for the M.Sc. Nursing students to Kerala Nurses and Midwives Council and to Govt. College of Nursing Thiruvananthapuram as part their Nursing Education practical.
- The College is a centre for observation visits for various Post Graduates Nursing students from various Universities in India as part of their Nursing Education and Administration experience.
- Celebrating festivals with villagers.
- Krishna Jayanthi and Guru Poornima are celebrated every year. During Krishna Jayanthi celebrations various competitions are held for creative thematic float constructions, bhajan rendition, dance, and singing among the departments to motivate the students to get involved.
- Skill development training for the women & E –literacy for the children.

**Promoting the participation of the students and faculty in extension activities including participation in NSS, NCC, YRC and other National/ International programmes**

- There are various active students clubs and organizations focused on social awareness and community engagement like Amrita Sanjeevani, Amrita Prakrithi Samrakshana Samit (Nature club), Green Friends, Amrita Blood Collectors and Donors (ABCD) Forum, Anti-Tobacco Movement at Amrita (ATMA), etc.
- There is also strong Co-curricular engagement of students through the conduct of national-level inter-university techfests and management fests like Anokha, Pragati (Coimbatore campus), Vidyut (Amritapuri campus), Asthra (Kochi campus), Aykya (Bangalore campus), etc.
- Students are encouraged to take membership and start student chapters of all major professional bodies in India and abroad like Confederation of Indian Industry (CII), IEEE, Society for Automotive Engineers (SAE), and Association for Computing Machinery (ACM), Computer Society of India (CSI), Institution of Electronics and Telecommunication Engineers (IETE), Indian Welding Society, Student Nurses Association of India (SNAI), Petrotech Society, Indian Institute of Chemical Engineers. CII Young Indians, CSI and IEEE student chapters are nationally recognized.
- Students are given the opportunity to participate in various medical, dental and special camps like cleft lip organized by the university in various locations as well participate in camps at sites of disaster relief and rehabilitation like Tsunami. Annually over 150 camps are being organized
- Amrita NSS actively involves itself in organizing various community development programmes for the benefit of villages located in the vicinity of the University.
- Ham Radio Club: A Ham Radio Club is actively operating in the campus. The Club conducts classes for the HAM license examination and also helps in acquiring the necessary equipment.
- Youth Red Cross (YRC): The Amrita chapter of YRC seeks to provide youth with opportunities for serving people regardless of their ethnic origin, nationality or religion. The YRC also helps in sensitizing the students about first aid, fire fighting, blood donation, emergency preparedness programmes etc.

Give details of social surveys, research or extension work, if any, undertaken by the university to ensure social justice and empower the underprivileged and the most vulnerable sections of society?

- As the University is run by the Mata Amritanandamayi Math, a world-renowned charitable organization, its faculty and students are frequently engaged in social service, community development, disaster relief, and supporting the underprivileged.
- “Amritasmitham”, a novel idea of Amrita School of Dentistry aims at providing the privilege of modern treatments even to the people living at remote places like in forest areas and tribal colonies. Here treatment is done free of cost.
- Research to develop a cost effective Insulin pump is internationally recognized and is further pursued to make it commercially available.
- Through its social initiatives, the university has tried to reach out to various underprivileged sections of the society. The slum children around the campus have been benefitted with the interest taken by our students. Also, the workers of the Institution are benefitted from these extension activities.
- Based on the community health survey, various health promotion activities are conducted in selected areas of the community to the underprivileged sections like organizing exhibition, conducts health awareness programmes, conducts research projects.
- Faculty members have initiated research activities in the old age homes, conducted role playing, and puppet shows in the rural areas to create awareness of social issues. They have also conducted health education or teaching session to the Geriatric groups, for blind youth, tribal populations of Wayanad, Kerala; nutritional assessment and education in the Anganwadi, chlorination of wells in the selected community areas, and school health programmes,
- Programmes for the members of Thozhilurappu Paddhathi (ensuring job) where health education were given on physical problems of women, cervical cancer, and breast cancer. In addition to this, a role play was also conducted on “healthy life style”. Tetanus toxoid immunization and health assessment were also done for these women.
- Since 2004, faculty members and students of Amrita School of Business have been involved in a community outreach programme in a Harijan colony (Dr. Ambedkar Colony) in Ettimadai. As a part of this programme, MBA students and faculty volunteers visit the Dr. Ambedkar Colony on Saturday afternoons. Activities in education are conducted for the village children. Over 70 children of the village benefit from this extension programme. Besides education, projects in improvement of infrastructure and health education have also been taken up. As a result of these efforts over the last eight years, the dropout rates from schools among the children of the village have dropped. A shed has been created with the money collected by MBA students for providing these weekend tuitions to the beneficiary students. The awareness about health and hygiene has gone up significantly among the village community. The program has contributed to increasing the willingness of both village students and their parents to invest in higher education. In 2004, when the programme

started, the village had only one college graduate. In 2013, there are ten students from Dr. Ambedkar Colony, including five girls, pursuing undergraduate degrees in government and private colleges.

[Does the university have a mechanism to track the students' involvement in various social movements / activities which promote citizenship roles?](#)

Each class advisor and counselor makes a note of these activities in the counselor's notebook. These inputs are considered for giving recommendation letters for higher studies and also considered for awards like Tata Consultancy Services (TCS) instituted Best Student Awards.

[Bearing in mind the objectives and expected outcomes of the extension activities organized by the university, how did they complement students' academic learning experience? Specify the values inculcated and skills learnt.](#)

Students get an opportunity to understand their responsibilities and roles towards social development along with their academic learning experience. It helps them in realizing the need for such a social commitment.

For students, such activities will provide them with lots of training in skill development, public speaking, and as to how to work with the community.

[How does the university ensure the involvement of the community in its outreach activities and contribute to community development? Give details of the initiatives of the university which have encouraged community participation in its activities.](#)

The university, under the inspiring guidance of its Chancellor, has year round activities that promote a sense of social responsibility and community service, involving both the staff and students. The activities span across different levels: socio-economic, technical, environmental, etc. A few examples are given below:

- Amala Bharatham clean up drive and awareness campaign – involves clean up of public places (such as bus stands and village crossroads, dumping grounds, etc.). Seeing the enthusiasm and the dedicated efforts, members of the public at large have regularly volunteered in support of the campaigns.
- Sabarimala clean up – up to 3000 volunteers at a time involved in clean up of the pilgrimage trail and rest places, bathing ghats, etc. The Sabarimala Trust as well as the Kerala Government have pitched in with their support of the selfless service activities.
- Tree plantations – Saplings are distributed, plantations are conducted, and awareness of beneficial effects of plantation and organic farming, etc., are taken up in nearby villages. Village adults, as well as the children, appreciate the activities, and the children enthusiastically take responsibility for the maintenance of the planted saplings. The efforts have also been recognized by the regional government office, and the IFS, DFO (Coimbatore) came to inaugurate one such plantation session at the Coimbatore campus of the university.
- Tutoring & support to school children – staff and students provide tutorial services to school children in nearby villages, and conduct special celebrations for festivals (such as Diwali), using such occasions to also

- distribute gifts to the children (such as school supplies).
- Employment – the university has provided a large number of employment opportunities to the members of the community. The nature of the employment includes academic, administrative, labor, contract services, trade, finance, etc.
  - Technical events - the constituent schools conduct scholarly events (such as technical conferences, seminars, symposia, & workshops) drawing participation from staff and students of various academic institutions as well as industries and government research labs, from within the state, as well as from the nation at large. These events have drawn some of the most renowned subject matter experts (including Nobel Laureates), scientists, industrial leaders, senior academicians, scientific advisors, and policy makers, not just from the country, but from across the world.
1. Festival celebrations – the various schools conduct elaborate celebrations to mark the significance, symbolism, and gaiety of various festivals, with participation from the local community. One of the most notable of these is the celebration of Gokulashtami. The event is marked by beautiful thematic floats that require innovative technical design and fabrication of the float vehicles and constructs, suited to the specific spiritual/cultural theme chosen for the occasion. The floats are part of a long procession, stretched over a kilometer, with various other activities such as group chanting, singing, dance, and acrobatics, with the public lined up on either side of the procession – all this culminating in a climactic finish, with a full assembly of the thousands of people in the large campus ground.

[Give details of awards received by the institution for extension activities and/contributions to social/community development during the last four years.](#)

The Computer Society of India (CSI) student branch of Amrita School of Engineering, Coimbatore has been adjudged as the best in India out of more than 600 colleges and universities for three consecutive years, i.e 2011, 2012 and 2013. An important extension activity of this student chapter is regular computer instruction like use of office management tools, graphics, presentation software, Internet usage etc for the tribal and rural students of the government schools in the immediate vicinity of the campus, Muruganpathy and Chinnampathy.

### [Collaboration](#)

[How has the university's collaboration with other agencies impacted the visibility, identity and diversity of activities on campus? To what extent has the university benefitted academically and financially because of collaborations?](#)

Despite its young age, Amrita has made great strides in all aspects of higher education. This has been recognized by the local community, the state, the nation, and even the world. The collaborations/interactions with other prestigious educational institutions in India (e.g., IITs), foreign universities (e.g., TU Delft – Netherlands, KTH – Sweden, University of California Davis – USA, Colorado State University – USA, Deakin University – Australia, EPFL – Switzerland), government R&D Labs & funding agencies (e.g., MHRD, DRDO, ISRO, DRDL), Indian industries (e.g., L&T, Honeywell,

Siemens, Robert Bosch, Reliance), and NGOs (e.g., I Create, Rest, Shanthi Ashram, Chaitanya, Devasrayam). This has greatly enriched the functioning of the university in many ways.

- Boost to the research community, raising the quality and standard of research to international level
- Attracting well qualified & talented teaching faculty & researchers from within India, as well as from other countries
- Improvement of facilities and infrastructure, including better equipment, library resources, and civil works
- Attracting greater numbers of motivated students for various programs
- Addition of specialized PG programs in collaboration with other agencies/institutions
- Enhanced curriculum through exchange of ideas and best practices on curriculum design and course management
- Improved research output at PhD level through presence of recognized subject matter experts in the doctoral committees

Mention specific examples of how these linkages promote

\* Curriculum development :

**Impact on Amrita's B.Tech (Chem Engg) program:**

Dr. P. Somasundaram (Professor, University of Columbia) has provided inputs for curriculum and syllabus of Interfacial Science and Engineering. He also gives guest lectures on the subject during his visit to Amrita. Dr. Subash H. Risbud (Director, Internship & Career Center, Distinguished Professor, College of Engineering, UC Davis, University of California), Dr. W.S. Sampath (Colorado State University) gave useful suggestions during his interactions with us, which we would be implementing in the next curriculum revision.

During our interaction we requested his help for developing and strengthening our academic program and among other things we requested his help with the following, subject to availability, feasibility and convenience:

1. To share with us some of the best academic practices that are being followed at UCDAVIS.
2. To share with us some of the PPTs / Lecture Notes developed by their faculty which are relevant to our UG students from chemical engineering.
3. To share with us some of the question papers on various subjects as per his convenience.
4. Curriculum and Syllabus of UG Program in Chemical Engineering.
5. A short list of student projects that were undertaken by their students, which can give us some guidance and inspiration.
6. List of Labs and Experiments that are being performed by the UG students.
7. Flow Diagrams of a typical petrochemical plant to be used for giving student projects during the Final Year.
8. Transfer of unused/obsolete lab equipment from University of California – Davis (which have been removed / replaced by new generation equipment) to Amrita for supplemental hands-on open labs.
9. Student exchange programs at the UG & PG level.
10. Collaborative NSF funding for purchase of equipment for carrying out our applied research projects.

\* Research

Major collaborative research projects have been initiated and completed.

\* **Publication :**

The high quality of internationally renowned work and exposure provides great motivation for publications.

\* **Student placement:**

Some of the collaborations have resulted in students doing their internship in US. Examples are the student internship offered by University of Nebraska and University of New Mexico. Presently one of our third year students has been offered an opportunity to do is seventh semester in University of New Mexico.

\* **Any other (please specify)**

**Have the university-industry interactions resulted in the establishment / creation of highly specialized laboratories / facilities?**

Industry sponsored labs in association with Agilent Technologies has set up a cutting-edge analytical centre named Amrita Agilent Analytical Research Centre at Biotechnology school, Amrita Cognizant Innovation Laboratory for Computer Vision & Image Processing , Microsoft sponsored embedded systems laboratory; Robert Bosch - Automotive Electronics Laboratory; Atmel and ARM Micro-controller Unit Lab etc at Amrita School of Engineering, Coimbatore

The Dept. of Chemical Engg. And Materials Science expects to have a major collaboration with IOCL for which negotiations are in progress with respect to IPR. We are also discussing with NCL for setting up a composite technology lab in our premises.

AMRITA-ATMEL MCU CENTRE has been set up in July-2012 for Rs.1,59,640.

Name of the Equipment	Description	Quantity
AVR Explain	8 Bit Platform	15
EVK1100	32 Bit Platform	5
AVR Dragon	Debugger module	20

Significant outcomes of the AMRITA – ATMEL MCU center:

1. Development kits received in Phase I were utilized for offering the following electives:

- EC326 Embedded Systems – 3 credit course for 3<sup>rd</sup> year ECE/EIE students
- VL707 Embedded Controllers and Real time Operating System – 3 credit course offered for 2<sup>nd</sup> year M.Tech students.

Planning to offer new elective ‘Embedded C and AVR Programming’ for B.Tech. students

2. Lab Utilization:

- B.Tech. students from ECE/EEE/EIE/CSE for their regular lab sessions as well as academic project work. Post graduate students of VLSI, Embedded Systems and Biomedical engineering for academic project work.

***Any other information regarding Research, Consultancy and Extension, which the university would like to include.***

- One of the largest telemedicine networks in India with the support of Indian Space Research Organization (ISRO). The telemedicine service is connected to 60 major hospitals in India and 9 international centres, including remote locations in India like Lakshadweep, Leh etc. This is also one of the five centres selected by the Ministry of External Affairs, Government of India for providing telemedicine, tele-consultations, tele-surgery and Continuing Medical Education (CME) and distant medical education programmes all over the world.
- A centre for spiritual studies launched with the objective to offer credit-based academic programs in all aspects of Sanatana Dharma, spirituality and culture at post graduate and doctoral levels as also engage in research activities like the study of Sanskrit language and literature, study of the scriptures – Vedas, Upanishads, Bhagavad Gita, Shad Darshanas, etc and study of arts, science, technology, literature and astrology from a spiritual perspective, thereby reinforcing that underlying principles in these disciplines are expressions of spirituality.
- Some of the futuristic research & development challenges posed by the AMRITA Chancellor include projects with wide-ranging societal and humanitarian application and benefit. These are excellent opportunities for multi-disciplinary research teams drawn from various schools of the university to work on. Some of these include development of low-cost sanitary napkins, nanomedicine applications, Mobile applications for health care monitoring, Alternative energy sources into miniaturized components for use in rural areas, nanostructured low cost materials for water purification and sensors to test the quality of the water, Robotics and Haptics technology for surgical assistance, medical simulation and training, etc,

## **CRITERION IV: INFRASTRUCTURE AND LEARNING RESOURCES**

Amrita University Management has had an uncompromisingly strong stance, ever since its inception, in not only meeting, but exceeding, the infrastructure requirements of all of its campuses. In conducting need assessment and quality enhancement exercises, the following values have been taken into consideration: Adequacy and optimal use of facilities, Provision for expansion and growth, Access to ICT facilities, and Effective maintenance of facilities.

### **Physical Facilities**

**How does the university plan and ensure adequate availability of physical infrastructure and ensure its optimal utilization?**

As per university policies, whenever a new program is started, a formal proposal is to be raised with detailed information on requirements for land, built-up area, civil works, equipment, and facilities. This is routed for approval all the way up to the academic council.

Additionally, when new initiatives are launched, such as a research center, the university supports extensively with sponsoring the required facilities and infrastructure, for both short and long term.

Every campus has a facilities management team, which, as part of the general administration department, is responsible for ensuring optimal utilization of the classrooms, auditoria, seminar halls, labs, gyms, playgrounds, swimming pools, hospitals/clinics, libraries, etc. Additionally, this department works closely with academic sub-committees like the Time Table Committee, to ensure that the facilities are used in an optimal way, while not compromising in any way on the requirements for the smooth functioning of each academic program.

**Does the university have a policy for the creation and enhancement of infrastructure in order to promote a good teaching-learning environment? If yes, mention a few recent initiatives.**

With expansion in terms of increased intake in existing programs, or with the addition of new programs, there is a corresponding need to create and enhance the infrastructure in a commensurate manner. Amrita University has seen a fast-pace of growth in both ways, over the past five years and more. The university management has ensured that the infrastructure is adequate and well maintained. A few examples are given below.

2. Where required, the lecture halls are air-conditioned, and classrooms fitted with a PC, LCD projector, and audio system.
3. Basic amenities like washrooms, high-purity drinking water, canteens are provided in adequate numbers.
4. Every year the university (and each constituent school) invests a greater amount in adding to the number of books, journals, & electronic information content in the library.
5. As mentioned above, every proposal for starting a new program must mandatorily contain details of the infrastructure and human resource requirements mandatorily, as per university policy.

6. A few examples of the immense support (amounts to INR tens of crores) provided by the university are:
- Space and infrastructure for numerous research labs (Materials Research Lab, Biosensors Research Lab, TIFAC Center for Cyber Security, Center for Environmental Studies, Virtual Labs, CREATE Labs, ELearning Labs, AMMACHI Labs, Remote Sensing Labs, Class 10,000 Cleanroom for the Amrita Biomedical Engineering Research Center, etc.
  - Uninterrupted power supply (with diesel generator power stations)
  - E-learning studios
  - Gymnasiums, playgrounds, and swimming pools
  - Medical facilities: clinic, ambulance service, and hospital
  - General stores, canteens, auditoria, staff quarters, etc.
  - Travel reservation center, bank, ATM, post office, telephone booth, etc.
  - Space for student recreation centers / clubs
  - Guest House
  - Electric vehicle to transport the elderly (within campus), wheel chairs, intra-campus shuttle buses, and college buses plying to the city for day scholars
  - Meditation and prayer halls
  - Wireless connectivity
  - Reprography
  - 24x7x365 Security services
  - Fleet of vehicles (transportation services)

One of the best practices prevalent is the complete self-sufficiency of the university in terms of providing for its needs in terms of furniture, fittings & civil works, and special construction accessories. The university has several carpentry, fabrication, and welding units that meet the needs fully in providing for building construction fittings, home furnishings, furniture, classroom fittings & furniture, and special jobs undertaken for major events (convocation, Gokulashtami celebrations, campus techfest, etc.).

#### [Creating a conducive teaching-learning environment through provision of adequate facilities](#)

All our campuses have excellent computing facilities, supported by knowledgeable and sincere staff from the local ICTS departments, with services that meet the needs of all the students and staff.

At the time of starting a new program, a detailed assessment is done (including inputs from the experts in the Boards of Studies) to identify the requirements for laboratories, computing facilities, and any other allied services (e.g. support in terms of library resources, case studies, 3D Modeling & Simulation packages, software, etc.). The requirements are routed through the proper channels for approval and purchases are made. Periodic, rigorous, stock-keeping is conducted to ensure continued adequacy of facilities and resources, and equipment & facilities maintenance processes are set in place.

Office rooms, separate wash rooms for men and women staff & students, and lifts (to enable a disabled-friendly environment) are planned and provided for, by default, on all the campuses.

#### Meeting the requirements of residential students

- Hostel facilities and amenities are provided on all our campuses in sufficient numbers. Apart from spacious rooms & mess halls, the amenities include solar water heaters, clothes washing area, recreation area (table tennis, volleyball court, TV room, etc.).
- Students have access to the clinic 24x7, with a doctor on call at all times.

#### Library as a Learning Resource

Each school has a library committee comprising members from various academic departments, and supporting departments (such as ICTS).

At the department level, a group of faculty members along with the Chairman serve as the departmental library committee. This committee gets the requirements from students and faculty members and recommends to the Head Librarian of the school/campus library.

Library hours are established so as to provide adequate access to students and faculty, with extended hours prior to exams. Libraries are equipped with search stations, reading rooms, computers, and special sections for new releases, reference materials, and other specialized collections.

Access to the library materials (including catalog, user account information, checked out status, etc.) is provided via the following:

- \* OPAC (Open Public Access Catalogue)
- \* Electronic Resource Management package for e-journals
- \* Federated searching tools to search articles in multiple databases
- \* Library Website
- \* In-house/remote access to e-publications
- \* AUMS (Amrita University Management System)
- \* LIBSYS 4.0
- \* Amrita Vidya

Smooth operations and transactions in the library are ensured by following good practices and conforming to established policies. A brief summary of the same is given below.

- \* A clear floor plan is displayed in a prominent place in the Library.
- \* Adequate number of sign boards are placed at appropriate places.
- \* A firm alarm is installed. Protection against accidental fire is ensured through the use of fire-extinguishers placed at strategic locations in the Library.
- \* Extra care is taken for good house-keeping practices like regular vacuum cleaning of the racks and surroundings, removal of dust & moisture accumulation near book-stacks, use of naphthalene balls on the book-

shelves etc., to prevent the attack of the physical paper books from insects like Silver-fish, book-lice, book-worms, cockroaches etc.,

- \* Damage and wear-and-tear of physical books are minimized through regular maintenance and good 'Book Handling Practices'.
- \* E-Resources and Library databases are well secured through efficient password protection and modern e-security methods.
- \* The General ID-Card issued by the Institution is also used as the ID-Card for gaining entry into the Library, including borrowing of books. Entry and exit of the users of the library are monitored through a full-time security guard posted at the main entrance to the library, or through biometric systems. Appropriate entries (like sign-in and sign-out of the Library Users, details of books going out etc.) made in the register maintained at the security point, help in the collection of the library usage statistics, in addition to providing an audit trail for the transactions.

A sample of the data on **library holdings** is given in the table below. Detailed information is available (upon request) in the school-level reports.

School Name	Books	Gift books	Back volumes of journals	The ses	Project reports	Print Journals National	Print Journals International	Print Magazines	Book Titles	Peer reviewed journals (print + online)
Medicine (Kochi)	12878		3800	537						
Arts & Sciences (Amrita puri)	41431			150						
Arts & Sciences (Mysore)	10,000									
Biotechnology (Amrita puri)	2700			423						
Engineering (Amrita puri)				150						
Engineering (Bangalore)	26739	2779	363	2	1087	82	27	94		

Engineering (Coimbatore)	57700		6,600			151	115	109	40217	1160
Dentistry (Kochi)	4.240									
Management (Amritapuri)	3769		1922		98	48		23		
Management (Bangalore)			5453			31	14		3880	
Nursing (Kochi)	4921									
Pharmacy (Kochi)	12891		200	174						
Management, Coimbatore	15056									

Average number of books added during the last three years:

School Name	Books
Medicine, Kochi	2236
Arts & Sciences, Amritapuri	4000
Arts & Sciences, Mysore	800
Biotechnology, Amritapuri	770
Engineering, Amritapuri	4000
Engineering, Bangalore	5000
Dentistry, Kochi	2000
Management, Amritapuri	548
Management, Bangalore	1500
Nursing, Kochi	294
Pharmacy, Kochi	225
Management, Coimbatore	433

Non Print (Microfiche, AV):

School Name	Non Print (Microfiche, AV)
Arts & Sciences, Amritapuri	DVD -3227
Arts & Sciences, Mysore	700 CDs
Engineering, Amritapuri	DVD -3227
Engineering, Bangalore	CDs : 2591 Nos DVDs : 55 Nos
Engineering, Coimbatore	CDs/ DVDs : 4,749 Data Bases : 10

	Online Journals : 1829 Audio Visual resources : 100
Dentistry, Kochi	125
Management, Amritapuri	250 CDs
Management, Bangalore	500 CD's & DVD's
Nursing, Kochi	356
Management, Coimbatore	1058

Electronic:

The list of electronic resources consolidated across the five campuses is given below:

- Science Direct
- ASME
- J-Gate (Engineering & Technology)
- ASTM Standards and Engineering Digital Library
- Access Engineering (McGraw-Hill)
- IEEE (ASPP Package)
- Springer link
- EBSCO ([Business Source Complete from EBSCO](#))
- [ABI/INFORM Complete \(PROQUEST\)](#)
- [CAPITALINE](#)
- India Business Insight Databases (IBID):
- CABELL's Directory
- [CRISIL Research](#)
- J-Gate: Management & Social sciences
- SUNY-Buffalo University e-resources
- PROQUEST online journals
- SUNY-Buffalo (USA) online journals (available through a collaboration with Amrita University)

Special Collections:

School Name	Text books	Reference Books	GK & General books	Standards	Patents
Arts & Sciences, Amritapuri	304 31	4500	6500		
Biotechnology, Amritapuri		634			
Engineering, Amritapuri	304 31	4500	6500		
Engineering, Bangalore	a. Competitive examination books b. Placement books c. Reference books / Foreign edition : 5703 Volumes & ASTM Standards and Engineering Digital				

	Library				
Engineering, Coimbatore	9737	6109	Competitive examinations : 1,355 Book Bank : 946 Project Reports : 2528	370	
Management, Amritapuri	40	92			
Management, Bangalore		1200	Placement materials : 250 Volumes		
Nursing, Kochi	217				
Management, Coimbatore	a. Case studies collection : 123 b. Reserve bank of India\World Bank publications : 70				

A summary of the usage statistics (monthly basis) is provided in the table below. Additional details are available in the school-level reports.

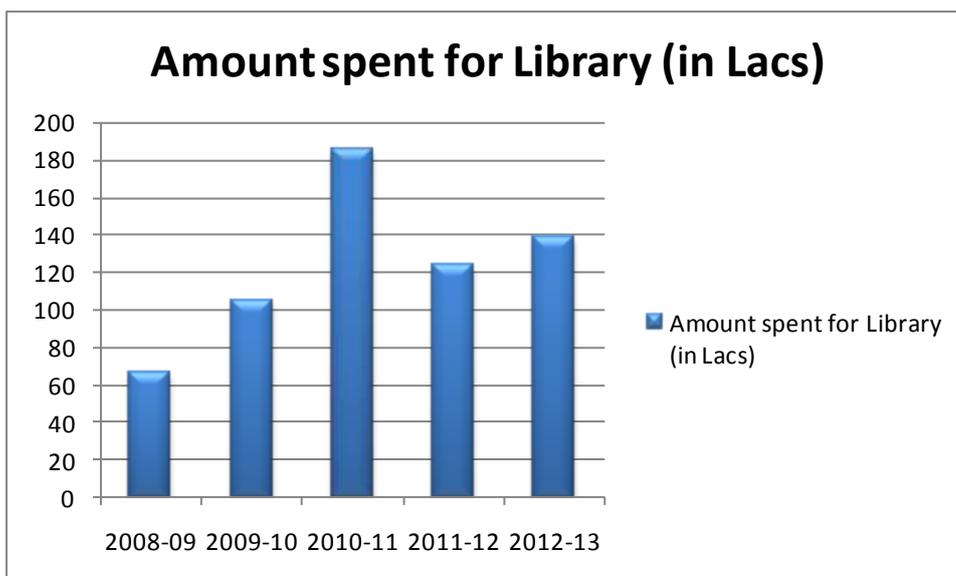
School Name	Average number of walk-ins	Average number of books issued/returned	Ratio of library books to students enrolled	Average number of books added during the last four years	Average number of login to OPAC	Average number of login to e-resources	Average number of e-resources downloaded/printed	Number of IT (Information Technology) literacy trainings organized
Medicine, Kochi	250	issues 8/day, return 9/day	1:1	2786	15	80	50	4 sessions
Arts & Science, Amritapuri	300 to 400	400/350	15:1 20	3045	150	100	100	2
Arts & Science, Mysore	100	120	12:1	1547				

Biotechnology, Amritapuri	1500	800	10:1	910				One annually
Engineering, Amritapuri	300 to 400	400/350	15:120	3045	150	100	100	2
Engineering, Bangalore	15,000	10,000	1:15	7800 Volumes	50-75 Logins (IP address & Public Access)	50 Logins	They are done through IP address	4 programmes
Engineering, Coimbatore	8045	300	1:11			770		
Dentistry	60	issue 25/day, return 20/day	13:1	500	10	15	20	2
Management, Amritapuri	600	issue-40, return-35	31	1903	60-90	100-150	50	

ASB Bangalore	25-35 users / Day	Approximate 50 books	45 books: 1 Students	1500 Volumes	It's a WEB OP AC , users can access from outside the library also	Access through IP address	Maximum utilization from users	Every year conducting a Orientation Programmes / PPT Presentation for using library resources to MBA students. Also Three workshops conducted for users
Nursing , Kochi	10 - 15	45/day	13:1	134		10	10	10
Pharmacy, Kochi	3000	Issue + Return -3500 (Average)		970	50	50	50	
Management, Coimbatore	50	35	1:62	475	1000	3000	1000	

### Library Budget

While there is no annual budget, management supports procurement of library resources on a need basis. Requirements are gathered at least once a year at the department level, and routed for approvals, followed by a centralized purchase. The university's commitment to the support of library resources is seen clearly in the investments made over the past five years – shown in the graph below.



In order to encourage and motivate greater usage of library facilities and resources, the library committee regularly launches initiatives after receiving inputs from students and faculty. Some of the actions taken include:

- Attractive display of new arrivals
- Increased loan privileges of users
- Automated (biometric) sign in and sign out at the entrance
- Information dissemination through E-bulletins, published quarterly through intranet
- Separate reading rooms for students
- Permission to use laptops inside the library
- Expansion of Digital Library with 100 Computer systems with Internet access
- Separate cubicles for research scholars
- Establishment of Back Volume Section
- Establishment of Textbook Section
- Conduct of book exhibitions by publishers/vendors
- Orientation sessions for newly admitted students
- Circulation of new catalogues to departments

#### [Guidance of M.Phil & Ph.D. and Shodhganga Project \(INFLIBNET\)](#)

The university participates in Shodhganga by depositing PhD thesis through INFLIBNET.

The following is a school-wise summary of the M.Phil/Ph.D. students guided during the reporting period.

#### **ASAS Amritapuri**

One research scholar has successfully completed PhD in the department of Physics.

### Amrita School of Biotechnology

Yes, our University participates in Shodhganga by depositing PhD thesis  
Total number of PhD students passed out in last 4 yrs is 8 (?)

### ASE, Amritapuri

Ph.D. guidance

Dr. P.S. Chandramohanan Nair - 7 (ongoing)

Dr. P. Kanakasabapathy - 2(ongoing)

Dr. Manjula G Nair - 1 completed, 1 ongoing

Dr. Balakrishnasanka r- 2 (ongoing)

Dr. R. Ajithkumar - 2 (ongoing)

Dr. J.S. Jayakumar -2 (ongoing)

COMPLETED

Dr. Renu Ph.D. (Signal Processing) August 2013

Dr. Purushottaman Ph.D. (Analog VLSI) June 2013

ONGOING

Research Scholar Under **Dr. Venkat Rangan, V.C.**, Amrita

1. Name: Rajesh Kannan Megalingam

Research Topic: Navigation Algorithms

Research Scholar Under **Dr. Nithin Nagaraj**

2. Name: Karthi Balasubramanian

Research Scholar Under **Dr. Bibhudatta Sahoo**

3. Name: Vineeth Sarma

4. Name: Rahul T.

5. Name: Chithira Ravi

6. Name: Nevin Alex Jacob

Research Scholar Under **Dr. G Jayachandran Nair**

7. Name: Poorna S.S.

8. Name: Lakshmi Nambiar

9. Name: Chinmayi R.

Research Scholar Under **Dr. Dhanesh G. Kurup** (Professor at Bangalore Campus of Amrita Vishwa Vidyapeetham)

10. Name: Athul Shaji

### Pharmacy, Kochi

Dr. Sabitha M., Principal Amrita School of Pharmacy is presently guiding a Ph.D. student.

### **IT Infrastructure, Policies, & Service Management**

The University has its own IT service management, managed by ICTS (Information and Communication Technology Services). The department is responsible for identifying, providing and maintaining reliable computing facilities, computing network environment, communication facilities and related infrastructure to facilitate education, research, instructional and Institute approved business services.

The University has well established network infrastructure. All the users are provided with username, password and limited storage space in the server. All the systems are connected. Labs are separated by subclass network. So they cannot access from other lab.

Well established firewall settings and antivirus packages are being applied in all the campuses.

The University has its own Software Asset Management group, under the ICTS department. The group has laid down policies for software purchase and maintenance.

Budgetary planning & execution pertaining to purchase of hardware is done normally at the end of each academic year based on the inputs received from different departments. During the planning stages the department representatives provide close scrutiny to the existing resources to ensure optimal utilization, and subsequently make recommendations for additional needs. The inputs are gathered via conduct of special meetings, as well as through email or paper-based surveys.

Maintenance of accessories at ICTS happens at 3 levels – daily, half-yearly and yearly. While ‘System Help Check-up’ including clearing previous history from the browser and anti-virus update, printer and toner maintenance are taken up on a daily basis, cabinet maintenance and stock verification happens half-yearly. The required software installations/renewals and warranty monitoring are looked into as a part of the annual maintenance.

ICTS plays an important role in numerous ways. A brief report of their contributions to the various functional areas of the university is given below.

- **Online BTech Counseling System** – A unique system has been created in-house that facilitates counseling for BTech Admissions simultaneously across three campuses (Coimbatore, Amritapuri, and Bangalore). Applicants that have qualified through writing the All India Amrita Engineering Entrance Test are eligible to appear for counseling at any of the campuses, and can choose any available seats in their preferred campus.
- **CISCO Networking Academy** at the Institution is one of the foremost Local Academies established by CISCO Systems in India. The academy during the past years has won various awards and accolades in recognition of its contribution to the Networking Academy Programme. All the faculty members in the academy are authorized instructors trained as per CISCO Systems guidelines and are Certified CISCO Academy Instructors (CCAI). A well equipped Networking Lab is the predominant feature of the Academy. The academy offers CISCO Certified Networking Associate (CCNA) and CISCO Certified Network Professional (CCNP) courses to the students in the campus. These courses help the students to secure CCNA and CCNP Industry Certifications. Students who undergo this programme can avail up to 75% discount for the CCNA Industry Certification. The Academy also offers IT Essentials, PC Hardware and Software Curriculum. A Networking Club is also functioning as per of this Academy which conducts several workshops, seminars and industrial visits for the benefit of the students.
- **EPABX and Video Surveillance Systems:** Configuration of the EPABX software and assigning extension numbers to departments based on the approval from higher authority. This system has 32 digital lines and more

than 352 analog lines. Periodic health checks and inspections of both EPABX and Video Surveillance Systems are conducted.

- Gate Pass System: Computerized gate pass system is in place for tracking movements of hostellers. Students use their college ID cards to swipe in this system.
- Faculty Feedback Server: A web based faculty feedback system is in place and periodic reports can be generated using this system.
- Interactive Media: It is a division of ICTS which takes care of Web Designing and Multimedia Jobs of the campus. Various activities such as designing of banners & Posts of all the events, ID card designing and printing are done here. This section also takes care of the maintenance and updation of the website.
- Help Desk: Using this online system, staff members can register service requests related to computing and printing facilities. This system is also used for advance booking of E-learning halls and projector facilities etc. Once the request is registered an automated confirmation mail service ticket is mailed to the requester. Upon resolving the issue another mail would be sent to the requester intimating the current status and/or actions taken.
- Amrita-Mail: Mail server maintained by ICTS which is used by staff members for official communication. Every staff member upon joining Amrita is given a mail ID with a storage capacity of 200-500 Mbps. Group mail facility is also available to specific groups upon request. This mail service is moderated by ICTS which helps in controlling spam and junk mails from outside.
- AUMS Support: Two staff members of ICTS department are involved fully in AUMS administration and support. They resolve issues related to AUMS usage. They also provide user level training to the newly joined staff members every year.
- Personal Laptops and accessories service & repair: Personal laptops and other accessories of all staff members are serviced and repaired at a nominal charge by ICTS. This facility is extended to the students also.
- Professional Skills Enhancement Aid for staff members: ICTS staff members are constantly encouraged to improve their educational and professional qualifications by undergoing training and certification programmes. Financial support and sabbatical leave are provided to those who attend such programmes. As a matter of policy, ICTS provides an ideal ambience for higher educational for its staff members.

## **ICT-Enabled & Online Teaching & Learning Resources**

### **Digital Library**

The university has digital library facilities where staff and students have an access to several reputed journals, magazines, newsletters such as IEEE, Springer and ACM, and a digital library server VIDYA, which is loaded with MIT's OCW (Open Course Ware), NPTEL, Stanford Lecture Series, and numerous other internet-based contents, to support the teaching and learning processes. Express permission is sought for the links to the existing resources created by agencies/institutions outside Amrita, ensuring no violation of

copyrights. VIDYA contains a total volume of 1.5 terra bytes of data, in video, audio, and text formats.

The university, through a MoU signed with SUNY-Buffalo, USA, was provided with access to their digital library system with its vast collection of scientific journals, magazines, books, encyclopedias, dissertations, and other resources.

### [Amrita University Management System \(AUMS\)](#)

This is a comprehensive software system that was developed in-house, and encompasses all aspects of the university's academic and administrative functioning. A brief discussion of its usage with respect to the above points is given below:

- **Administrative procedures including finance:** includes student and staff profiles, fee management, accounting, issue of certificates (bonafide, transfer certificate, grade sheet, degree certificate, etc.), etc.
- **Student admission:** a state-of-the-art admissions module enables simultaneous counseling for BTech admissions across multiple campuses (in three different states), and the entire data - from issue of hall tickets, to rank data, and entry data upon admission – is captured in the system, subsequently generating roll numbers that feed into the student registration & evaluation processes.
- **Student records:** apart from personal profiles, this includes student registration records, marks & grades, student progression data, progress reports, hostel information, etc.
- **Evaluation & Examination procedures:** the entire gamut of activities from registration through results, including attendance and other data are captured and maintained with appropriate access levels to students, faculty, management, administrative personnel, parents, and other stakeholders.
- **Research administration:** in the staff profile, there is a provision for faculty members to maintain records of research publications, conferences attended, research grants received, etc.
- **Others:** E-learning module – this provides an excellent suite of tools for the teaching-learning process, including the provision to set up question banks, conduct online exams, share teaching materials & resources, host discussion forums, conduct surveys & polls, generate course-related performance-reports, etc.

### [Amrita Virtual Interactive E-learning World \(AVIEW\)](#)

This is an award winning indigenously built multi-modal, multimedia e-learning platform that provides an immersive e-learning experience that is almost as good as a real classroom developed. The system was developed by Amrita E-Learning Research Lab, Amritapuri campus.

**A-VIEW Classroom:** A-VIEW classroom is a framework that provides a rich interactive social environment for E-Learning. It is a simple, user friendly video conferencing software, which provides a great opportunity to a teacher to teach in a live interactive model to various geographical locations across India, or even the world.

**A-VIEW 1 Gbps National Server:** Honorable President of India, Shri Pranab Mukherjee dedicated the 1 Gbps A-VIEW server to the nation on 11th November 2012. Other than regular A-VIEW servers, this new server is also being used to conduct several online classes.

**A-VIEW on Aakash Tablet:** Honorable President of India, Shri Pranab Mukherjee launched A-VIEW on Aakash 2 Tablet on 11th November 2012.

A-VIEW is currently deployed at 2609 higher education institutions including 445 Universities across India. Apart from regular online classes by various institutions, several National Programs such as Teacher Empowerment, Online Gurukul, Ask a Question, Weekly Discussions, ConnectONE etc., are being conducted using A-VIEW. IIT Bombay used A-VIEW to train 10,000 teachers in June-July 2012, which was inaugurated by the Honorable Union Minister for HRD Shri Kapil Sibal, also in November 2012, A-VIEW was used to train 14,000 teachers on a workshop on Aakash 2 tablets.

Internally Amrita faculty use AVIEW regularly to teach students in other campuses, as per the needs. Several important video conference-based meetings have also been conducted within the university using AVIEW to connect faculty and senior administrators from all five campuses. Well-equipped E-learning studios have been set up for this purpose, with seating capacity of up to 120 in each studio.

The university avails the National Knowledge Network connectivity such as NPTEL, Virtual Lab, etc.

### **VIRTUAL Labs**

Amrita University seeks to transform the landscape of Science and Engineering education through the use of virtual labs – a revolutionary technology-enhanced educational tool that extends laboratory learning beyond the walls of the classroom. The National Mission on Education using ICT has funded Amrita University along with 11 other partners.

Virtual labs are an immersive, media-rich online learning environment, where users can perform physical laboratory experiments in a computer simulated environment – anytime, anywhere. Whereas traditional physical laboratories require tremendous resources, virtual labs are cost effective whilst providing near hands-on experience of experimentation. Virtual labs provide an educational experience that helps broaden learner's perspective.

Amrita's VALUE (Virtual Amrita Laboratories Universalizing Education) labs apply new learning technologies that are exciting and fun for the new generation of students.

Virtual Labs have been built in the following thematic areas:

1) Biotechnology and Biomedical Technology: Neurophysiology, neuron simulation, biochemistry, population ecology, immunology, microbiology, molecular biology, cell biology, bio-inspired robotics, biophysics

- 2) Physical Sciences: Electricity and Magnetism, Heat and Thermodynamics, Harmonic Motion and Waves, Modern Physics, Optics, Mechanics, Electric Circuits
- 3) Chemical Sciences: Physical chemistry, organic chemistry, inorganic chemistry
- 4) Computer Sciences: Wireless sensor networks (wireless communication, propagation effects, experiments related to power consumption, transmission range, energy optimization, data collection)
- 5) Mechanical Engineering: Labs focused on renewable energy sources such as solar energy, wind energy as well as Strength of materials and energy storage related experiments

Over 30 virtual labs have been developed with more than 300 experiments as part of Amrita VALUE labs.

- 1) Vast collection of experiments across a broad range of disciplines
- 2) Scientific simulations
- 3) Remotely triggered experiments
- 4) Interactive animations
- 5) Guided videos of experimental procedures
- 6) Illustrated theory notes
- 7) Self evaluation quizzes
- 8) Web based access
- 9) Authoring platform for educators
- 10) Resource-rich learning environment

Amrita VALUE Virtual Labs was made available free of cost to Indian Institutions and students as part of the bouquet of labs launched by Ministry of Human Resource Department (MHRD) on Feb 23rd 2012. The Cabinet Minister, Shri. Kapil Sibal, during the launch stated, "*I have seen the content (of Virtual labs) myself and it is world class.*"

The VALUE Virtual labs won the “2013 World Education Summit Award” in the category of “Innovation in Open and Distance Education”. The event was organized by AICTE, MHRD, and UNESCO.

### **Maintenance of Campus Facilities**

A general administration department / estate office functions in each campus, headed by a General Manager. This department monitors and controls the sections listed below:

S.No.	Sections
1	Air-conditioning Maintenance
2	Amrita Recycling Centre
3	Art Work
4	Asset Management
5	Campus Keeping
6	Canteen
7	Centre for Environmental Studies
8	Electrical Maintenance
9	Effluent Treatment Plant

10	Events Management
11	General Works
12	Guest House
13	Hostels
14	House Keeping
15	Kitchen
16	Planning Department
17	Plumbing
18	Purchase
19	Purified Water
20	Quarters
21	Reprography
22	Security
23	Telecom
24	Vehicle Pool

Detailed reports on the activities and achievements of each of the above sections are available upon request (excluded due to space constraints).

The university routinely receives compliments and commendations from the visitors to its campuses, on the cleanliness and hygienic conditions prevalent year round.

## CRITERION V: STUDENT SUPPORT AND PROGRESSION

Recognizing that students are the primary stakeholders, Amrita University has evolved various robust systems and processes to achieve and sustain the following core values: Value-based education, Organized and effective welfare measures (including grievance redressal cells), Concern for vertical movement, Social justice & fairness, and Encouragement for holistic development (including extra-curricular, sports, & social service activities). The systems and processes are reflected in the sections to follow.

### Student Mentoring and Support System

The students are assigned to a student advisor when they join the institute. Every class has a class advisor and one or two and each student is assigned to a counselor. The counselor guides the students on academic, personal and psycho-social matters. It is mandated that the timetable should contain all these details. The School also has a professional counselor and a Student Welfare and Counseling department.

Remedial courses has been designed and incorporated into the academic structure to help low-performing students. The students who reregister for courses in lower semesters have provisions to do so without foregoing subjects in their current semester. The time table is framed taking into account the convenience of such students.

Structural and functional characteristics of the support system: The table below shows the various designations and the roles & responsibilities associated with each role, for the representative mentoring & support system at Amrita University.

*NOTE: While this is representative, there are some minor variations across the different constituent schools.*

	Designation	Scope	Function
1	Dean / Assoc. Dean / Principal	For the entire School	Oversees the overall conduct of the school. Assisted by Associate Dean, school level Academic Coordinator and Chairpersons.
2	School Academic Coordinator	For the entire School	Takes care of regular and remedial courses registrations of students at school level. Assisted by Department level academic coordinators. Liasons with Dean, COE, AUMS, faculty and students.
3	Department Chairman	For the department	Oversees the functioning of academic coordinator, class advisors/counselors,

			faculty and students.
4	Department Academic Coordinator	For all the classes of all programmes of the department	Takes care of regular and remedial courses registrations of students. Liasons with Chairman, COE, AUMS, faculty and students.
5	Batch Coordinator	For all the classes/sections of students admitted in a particular year, for a specific program	Oversees the functioning of the Class Advisors/Counselors
6	Class Advisor/Counselor	For a single class/section of students admitted in a particular year, for a specific program	Monitors all academic (including course registration) and personal issues of the students attached to him/her. Recommends leave/OD etc. Interacts with parents about performance of the student.

For weaker students, individual attention is given, and they are monitored regularly after the class hours. The time table provides a separate period for counseling to enable faculty to interact with the students. The students also interact with faculty in carrying out various minor and major projects outside classroom activities. The students are also provided with supplemental learning materials (such as the NPTEL video lectures), relevant to their area of study, to enable learning outside the classroom.

[Personal enhancement and development schemes such as career counseling, soft skill development, career-path-identification, and orientation to well-being for its students](#)

The university has made a structural systemic provision by incorporating into the curriculum a one – credit soft skill course in first one or two years of the undergraduate programs (depending on the duration of the program). The CIR (Corporate & Industrial Relations) department provides career counseling, soft skill development, career-path-identification, and orientation by professionals. They also provide skills in multiple languages and training for competitive examinations.

Yoga and cultural education are incorporated into the first year of the B.Tech curriculum as a two - credit subject for well-being for the students and as part of education for life. Amrita has had great success with another course offered in the first year of some of the PG programs, “Self awareness and personal growth”.

At the department level, faculty members with international experience regularly provide guidance and counseling to students applying for higher studies abroad. This includes guidance on choice of universities, review of the application documents (including the statement of purpose/research proposal), and providing letters of recommendation.

#### Provision of educational loans from banks

The banks proactively provide educational loans to students who seek them. The University provides the students with all necessary documents to students for availing such loans.

#### Prospectus and handbook

Yes, the university publishes its updated prospectus and handbook annually. Please refer to the yearly prospectus, curriculum & syllabi book, calendar, handbook for hostel rules and regulation and hand book for parents for details. Yes, through quarterly newsletter Amritarpan and annual magazine Amritadhwani all events held in the department, achievements of faculties and students, placement details are provided. It is available in the University Intranet, also available in Alumni Association Forum.

#### University scholarships / freeships given to the students during the last four years.

##### Amrita School of Medicine

All the programmes are self financed and fee concessions are given to financially very poor students on individual assessment.

##### ASAS, Amritapuri

- Scholarship based on Merit/ Financial Background

Sl. No	Name	Class	Year	University
1	Soorya K.R.	BBM	2008	University
2	Arya P.S.	BBM	2008	University
3	Rahul Rah	BBM	2008	University
4	Vipin R.	BBM	2009	University
5	Anu Sree	BBM	2011	University
6	Radhika R. Nair	BBM	2011	University
7	Amrita T.	BBM	2011	University
8	Kavya santhosh	B.Com	2012	University
9	Rahul K.	B.Com	2012	University
10	Sushamadevi R.	BBM	2012	University

- District Merit Scholarship

##### For 2009

1. Deepu J.S- M.Sc. Int. – AM306 PM004 – Rs- 8000/-
2. Harsh K.V – M.Sc. Int.– AM306 PM006 – Rs – 8000/-
3. Arushi P.V – M.Sc. Int. – AM 306 PM002 – Rs- 8000/-

##### For 2010

1. Arushi V. M.Sc. Int. 002 – Rs 400/- 2010

##### ASAS, Mysore

Around 3% of students receive financial assistance from various bodies like Women & Child Welfare Department, Govt. of Karnataka; Dept. of Social

Welfare, Govt. of Karnataka etc., in addition to scholarships provided by Community Associations, Teachers Association other private organizations.

**Amrita School of Biotechnology, Amritapuri**

S. No.	Name of student	Programme	Year of Enrollment	Scholarship Amount
1.	Deepa I.	M.Sc. Biotechnology	2006	Rs. 80000/- yr
2.	Lekshmy V.S.	M.Sc. Microbiology	2007	Rs. 60000/- yr
3.	Sandeep Bodda	M.Sc. Bioinformatics	2010	Rs. 75000/- yr

**ASE, Amritapuri**

S.No	Name of student	Programme	Year of Enrollment	Scholarship Amount
1	Anil S.	M.Tech. CSE	2011	Rs.8000/month
2	Aiswarya S Kumar	M.Tech. CSE	2011	Rs.8000/month
3	Bharath Reddy	M.Tech. CSE	2011	Rs.8000/month
4	Panduranga Rao	M.Tech. CSE	2011	Rs.8000/month
5	Sita	M.Tech. CSE	2011	Rs.8000/month
6	Jaseela M.	M.Tech. ME	2011	Rs.8000/month
7	Arya Soman	M.Tech. ME	2011	Rs.8000/month

**ASE, Bangalore**

The Institution provides a fee concession to top 10% of students admitted into each engineering branch. This fee concession is given to Karnataka students on the basis of merit, as determined by the rank secured in 'Amrita Entrance Examination – Engineering' and the fee concession is applicable for the entire 4-year period of the B.Tech. programme.

**ASE, Coimbatore**

	2008-2009		2009-2010		2010-2011		2011-2012		2012-2013	
	No s.	Amt. (Rs.)								
Scholarship (Govt. & Central) (Through Institution)	15	3,06,209	70	9,14,045	23	2,55,010	10	*1,33,300	8*	1,08,150
Of which paid through Bank (SC-ST)							9	*1,33,300	8*	1,08,150

Amrita Vidhyanidhi Scholarship for 1 yr admission based on Merit in Entrance Examination									65	3,25,000
--	--	--	--	--	--	--	--	--	----	----------

### Pharmacy, Kochi

#### PG Students –AICTE GATE SCHOLARSHIP

S. No.	Name of Awardee	Program, Department, & School	Award Criteria	Duration	Amount (Rounded-off to nearest 100 Rs)
1.	Asha Shaji	Amrita School of Pharmacy	GPAT Scholarship	2 yrs	Rs. 8000 per month
2.	Tanioa Sarah Thomas	Amrita School of Pharmacy	GPAT Scholarship	2 yrs	Rs. 8000 per month
3	Regin Elsa George	Amrita School of Pharmacy	GPAT Scholarship	2 yrs	Rs. 8000 per month
4	Honey priya James	Amrita School of Pharmacy	GPAT Scholarship	2 yrs	Rs. 8000 per month
5	Snehalatha S.	Amrita School of Pharmacy	GPAT Scholarship	2 yrs	Rs. 8000 per month
6	Hiba Iqbal K.	Amrita School of Pharmacy	GPAT Scholarship	2 yrs	Rs. 8000 per month

### ASB, Coimbatore

There is no specific policy to give financial aid to some students every year. But financial aid is given to deserving students on a merit cum means basis when needed. This is true for students who may be studying with us and suddenly face some financial hardship. There have been such cases in the last four years when we have helped students with financial aid when their families were struggling to meet their education expenses.

[Financial assistance to students from state government, central government and other national agencies \(Kishore Vaigyanik Protsahan Yojana \(KVPY\), SN Bose Fellow, etc.\)](#)

Across the various schools of the university, up to 2% of the students receive financial assistance from state government, central government, and other national agencies (the exception is Amrita School of Ayurveda, where approximately 6% of students receive financial assistance).

### Assistance to students for obtaining educational loans from banks and other financial institutions

The banks proactively provide educational loans to students who seek them. The university provides the students with all necessary documents for availing such loans.

### Types of support services available for:

#### \* overseas students

In the last four years, about 300 overseas and NRI students have taken admission in the School. Overseas Students can avail the following services:

- Counseling
- Extra class for academically weak students
- Special local language classes.
- Administrative help for Passport/Visa/Police Verification etc.
- \* physically challenged / differently-abled students
- Facilities such as lifts, climbers and wheelchairs,
- Special seating arrangements where ever required.
- \* SC/ST, OBC and economically weaker sections
- A separate book bank facility is available for SC/ST students in the library.
- A separate counseling is arranged for their academic guidance and other difficulties.
- Facilitating scholarships available from the SC/ST welfare department, Government of Tamil Nadu.

#### ○ students participating in various competitions/conferences in India and abroad

Faculty members provide guidance and training for students for participating in competitions, and presenting papers in conferences and seminars. The department provides On-Duty leave to participants of such events. The students are allowed to write the Missed Periodical exams in such cases. The department offer financial and other support like accommodation to students in many cases.

#### \* health centre, health insurance etc.

Health insurance is offered to staff and students.

#### \* skill development (spoken English, computer literacy, etc.)

The university has made a structural systemic provision by incorporating into the curriculum a one – credit soft skill course in the first 4 semesters of the B.Tech program. The CIR provides career counseling, soft skill development, career-path-identification, and orientation by professionals. They also provide skills in multiple languages, technical aptitude and training for competitive examinations.

The department provides intensive training in computer software that are extensively used in the industry like ASPEN and MATLAB to students to enable them to be employment – ready.

Learning and Development Wing of CIR provides training to students to hone their skills in numerical aptitude, including logical reasoning and problem solving. Emphasis is also placed on the development of good communication skills. Students have a chance to improve their skills through mock interviews, group discussions and presentations. Frequent tests are administered to simulate corporate testing processes, so when the students finally come face-to-face with the rigorous testing process of employers, there are no surprises. Classes are also conducted for interested students on foreign languages like German and Japanese.

CIR has instituted the Amrita Center for Entrepreneurship (ACE) to inculcate and nurture entrepreneurship capabilities in the students. The ACE Charter aims to: “Provide an eco-system that will kindle, nurture and support the innate desire and ideas lying dormant in the individual and create avenues to fructify those ideas into meaningful enterprises.”

\* [performance enhancement for slow learners](#)

The Department provides special coaching classes during the first semester to the students who have had no prior exposure to computer science. The students have been provided NPTEL video lectures relevant to their area of study to enable learning outside the classroom.

Remedial courses has been designed and incorporated into the academic structure to help slow learners. The students who reregister for courses in lower semesters have provisions to do so without foregoing subjects in their current semester. Please see the entry under remedial courses.

The last hour of every working day has been set aside for the students to meet the members of the faculty in person and clarify their doubts.

\* [exposure of students to other institutions of higher learning/ corporates/business houses, etc.](#)

The department gives assistance to provide students with in-plant training in reputed industries, research institutions like DRDO and CSIR laboratories and higher learning institutes like IIT and UCT, and International programs like EURECA, INDIA4EU PROGRAMS, Amrita UNM.

\* [publication of student magazines](#)

Amritadhwani: This is a college magazine from Coimbatore campus of the university, targeted at bringing out the literary and creative skills of students. Amritadhwani has been awarded with Tamilnadu Best College Magazine Award consistently for the last four years in a row.

The editorial team comprise of students and faculty members who assist in bringing out Amritadhwani every year. After the team receives the contributions from students and faculty, it is scrutinized, edited and proofread before it is sent for publication. Students are encouraged to contribute different kinds of articles, photographs, paintings etc. and articles can be written in Tamil, Telugu, Hindi, Malayalam, or English.

Other campuses have a similar set up and focus in terms of the college magazine.

[Guidance and/or conduct coaching classes for students appearing for Civil](#)

### Services, Defense Services, NET/SET and any other competitive examinations

CIR coordinates with external agencies for training students interested in higher studies to take examinations like GRE, GMAT, CAT, and GATE etc.

Details of students trained in competitive exams is as follows:

Exam	2010-11	2011-12	2012-13	2013-14
CAT	196	142	103	88
GATE	109	46	43	78
GRE	N/A	N/A	N/A	52
GMAT	N/A	N/A	N/A	16

Note: Each department conducts additional coaching on a need basis for these exams.

### Policies of the university for enhancing student participation in sports and extracurricular activities through strategies / schemes such as

\* additional academic support and academic flexibility in examinations

The students are On-Duty leave to participant in sports and extracurricular activities. The students are allowed to write the Missed Periodical exams in such cases. The department also supports extracurricular activities like Techfest and Janmashtami celebrations.

\* special dietary requirements, sports uniform and materials

\* any other (please specify)

The School provides such students with sports equipment facilities and TA/DA to attend inter-college and inter-campus events.

State & National level achievers are encouraged by awarding mementos and cash prizes.

Outstanding students are honoured as the best sports men and women of the year in the annual sports meet.

### Does the university have an institutionalized mechanism for students' placement? What are the services provided to help students identify job opportunities, prepare themselves for interview, and develop entrepreneurship skills?

Each trainer mentors two classes (approximately 60 in each class). This is done via one-on-one interaction, counselling and feedback on performance in group discussions, mock interviews etc. A record is maintained for each student.

In addition to classes for regular courses, CIR also conducts company specific training for students based on the company requirements. This enables them to prepare for the placement and perform well during the process.

CIR coordinates with external agencies for training students interested in higher studies to take examinations like GRE, GMAT, CAT, and GATE etc.

Classes are also conducted for interested students on foreign languages like German and Japanese.

CIR has a full-fledged setup for placing students from ASE, ASAS and ASB. The placement cell has a proven track record of consistent high quality placements year-on year.

The placement team consists of 11 members. The placement teams are managed by independent placement heads.

In order to consistent high quality placements, CIR has a Learning and Development wing to impart industry relevant skills. This is present in all the campuses of Amrita, with a total strength of more than 40 trainers.

In addition to the credit based Life, Soft and Corporate Skills training, company specific training is provided to all students prior to the placement process of that company.

The placement statistics and the list of companies that visited Amrita for placement are available upon request.

CIR has instituted the Amrita Center for Entrepreneurship (ACE) to inculcate and nurture entrepreneurship capabilities in the students. The ACE Charter aims to: “Provide an eco-system that will kindle, nurture and support the innate desire and ideas lying dormant in the individual and create avenues to fructify those ideas into meaningful enterprises.”

[Give the number of students selected during campus interviews by different employers \(list the employers and the number of companies who visited the campus during the last four years\).](#)

	2007-2008		2008-2009		2009-2010		2010-2011		2011-2012		2012-2013	
	Placed	Percent										
BTech	1040	98.0%	1181	92.0%	1134	95.0%	1523	100.0%	1480	100.0%	1234	99.0%
M.Tech. & MCA	173	81.2%	137	55.2%	129	59.4%	323	89.5%	354	83.3%	269	51.7%
MBA	115	100.0%	96	100.0%	118	100.0%	278	93.9%	203	95.8%	201	99.0%
Arts & Sciences	146	69.5%	147	72.1%	95	69.9%	244	68.2%	191	88.8%	218	66.0%

List of Companies

2008-	2009-2010	2010-	2011-2012	2012-
-------	-----------	-------	-----------	-------

2009		2011		2013
Access Technologies	ABS	Abiba Systems	Accenture Services	99 Acres
Adnics	Accenture	Accenture	Agilent	Aabasoft
AIMS	Acurus	Ace Insurance, KSA	Ahalya Foundation	Aakriti Media Promotion Pvt.Ltd.
Al-Ansari, Oman	Al-Ansari, Oman	Ahalya Foundation	Aim High Consultancy	ABCO Advisory Services
Allegro Financial Advisors	Asianet	AIMS	AIMS	ACS
Apollo Hospital	Atlas Healthcare	Ammachi Labs	Amazon Development Centre	Aditi Technologies
Atlas	AVT	Amrita TBI	Amba Research (I) Pvt Ltd	AEPL
BGR	Bank of Baroda	Amrita TV	Amrita Technologies	Amazon Development Centre
BGR Energy Systems	Berger Paints	Antal International	Antal International	Amrita TV
Calris	BGE Energy Systems	Aptara Learning	Anthem Biosciences	Antal International Ltd
Carmatech	Bharati Axa General Insurance	Asian Paints	Apollo Tyres	Aries Group
Caterpillar	Biocon	Atlas Health Care	Ashok Leyland Ltd.	Arohana Dairy Private Ltd
Cavin Kare	Birlasoft	Bajaj Capital	Asianet Chennai	Ashok Leyland Ltd.
Clarix	BP Ergo	Bank of Baroda	Atlas Healthcare	Asian Paints
Coca Cola	Canon	Basix	Axis Bank	Atlas Health Care Software

Cognizant	Caterpillar	Berger Paints	Azim Premji Foundation	Axis Bank
Crompton Greaves	Cavin Kare	Beroe Inc	Bajaj Finance Ltd	Axis Bank Ltd
Enercon (I) Limited	Cisco	BGR Energy Systems	Bank Of Baroda	Back Bench Studios
Federal Bank	Cognizant	Bhavan's School	BBR (INDIA) Pvt Ltd	Bajaj Allianz General Insurance
Ford	Collabra	Bin Dasmal, UAE	Beroe Inc.	Bajaj Capital Ltd
Genpact	Cordys Software	BINC	Big Synergy Media Ltd	Bajaj Finserv Ltd
Gtech Computers	Corporation Bank	Biobase	Bin Dasmal, UAE	Berger Paints India Ltd
Hapag Lloyd	Cummins	Biocon	Blue Dart Aviation Ltd.	Beroe Inc
HCL	CVC Technologies	BioGenex	Brakes India Ltd.	Bharti Airtel Ltd
HCL Infosystems	Defiance Technologies	Birla Sun Life Insurance	Capricon Technologies	Birla Sunlife
Honeywell	Dhanlakshmi Bank	Biz Sciences	Career Launcher India Ltd.	Blue Ocean Market Intelligence
HP	DOW Chemicals	Blue Star	Carmatec	Blue Star Ltd.
HP	Enercon	Career Launcher	Castrol India Ltd	Bose
IBS Software	ETA Technologies	Castrol	Caterpillar India (P) Ltd.	C Cubed Solutions
IDBI	Federal Bank	Caterpillar India (P) Ltd.	CHA YOWO Games	Café Coffee Day Ltd
iGATE	Frost & Sullivan	CDFC	Circor Flow Technologies	Canara Robeco

India Infoline	HCL	Cell Ad Technology	CISCO Systems (I) Pvt. Ltd.	CAT Cyberlabs & Entertainments
India Tech	HDFC	Cellworks	City Union Bank	Caterpillar India
Infosys	Hewlett Packard	Changepond Technologies	CNRI	Cbazaar
Invictus Technology	Hi Design	Child line	Cognizant	Channelp lay
IOCL	Honeywell Technologies	Chiron Panacea Vaccines	Crisil (Irevna)	Chayow o Games
ISRO	IBM India Ltd	Circor Flow Technologies	Cuppy Cakes	Cholama ndalam Investme nt
Jindal Steel & Power Ltd.	ICICI Prudential AMC	Citi Bank	Darshanan TV	Circor Flow Technologies
KIMS	ICICI Securities	City Union Bank	Defiance Technologies Ltd.	CISCO
L&T	IFI	CNN IBN	Deloitte Consulting	Citi Bank
L&T ECC	IFMR	CNRI	Dept. of Social welfare	City Union Bank
Lakeshore Hospital	Indian Air Force	Cognizant	Enercon ( I ) Ltd.	Cityon.Net
Leela Hotels	Indian Army	Cordys Software	Ericsson	CMA CGM Shipping India
Marico	Indian Express	Deloitte Consulting	Ernst & Young	Cognizant Technologies
Medical Resources India	Infosys	Deutsche Asset	EXL Serbices	Colgate Palmolive

Microsoft	Irevna	Devagiri college	FACE	Consolidated (I)
MindTree	Kotak Securities	Dexterity	Fidelity Business Services	Data64 Techno Solutions
Nest	Kundan Pipes	Dr. Reddy's	Flowserve India	Deccan Chronicle
Nestle	L&T	Eco Lab	Ford India (P) Ltd.	Deloitte Consulting India
NSH Corporation, Saudi	L&T ECC	Elder	Fresh & Honest Café Ltd	Delphi Automotive Systems
Oracle	Leitner Shriram	Enzen Global	Globelink - Hyderabad	Digital Corp Solutions Inc
Oriental Consultants	LG	ESAB India	GMMCO Ltd.	DreamGains Financials
Patni Computer Systems	Marico	Financial Software Systems	Goodrich Aerospace	Ecomzera Online Services
Philips	MAS Holdings	Flowserve India	Google India	The Elitists
Polaris	MindTree Ltd.	Ford India Ltd	Greenback Forex	eLitmus Evaluation
Pushpagiri Hospital	MTR Foods	Forus	HCL	Ericsson
Quest Global	NDDB	Freshers World	HDFC Ltd	Ernst & Young
Rainbow FM	NDTV	Future Group	Hindustan CocaCola Beverages	Essilor
Robert Bosch	Neyveli Lignite Corporation	GMMCO Ltd.	Hyundai Motor India	Eurocon Tiles
Sasken Communication	Nomura	GoFrugal Techno	IBM India (P) Ltd.	EXL Services

		logies		
SCOPE International	NPS	Golgi USA Lab	IBS Software Services Pvt Ltd	FACE
Society of Electronic Transaction & Security	NSH Corporation, Saudi	Green Pepper Consultancy	ICICI Bank Ltd	Federal Bank
Simpson & Co.	PACE Micro Technology	Group M	ICICI Securities	Fenner (India)
South Indian Bank	Pantaloon	Havells India Ltd	Idea Cellular Ltd	Filmi Paradise
Sundaram Finance	Patni Computer Systems	HCL Infosystems	iDiscoveri	Flowserve India Controls
Sundaram Finance	Philips	HDBF Services	India First Life Insurance Company Ltd	Frankfin Institute of Airhostesses Training
Sutherland	PRDC	HDFC Bank	Indian Bank	Future Generali India Life Insurance Company Ltd
Suzlon	Rane TRW Steering Systems Ltd.	HDFC Ltd	IndusInd Bank Ltd	Garuda Vayu Shakthi Ltd.
Tata Steel	Robert Bosch	Heritage	Infinite Computer	Gifting India
TCS	Sanmar Engg	Hewlett Packard	Infosys Technologies Ltd	Global Technologies
TCS	Schneider Electric	Hidesign	Institute of Bioinformatics	GMMCO Ltd.
TESCO	Shanthi Gears	Himalaya Drugs	Invirtogen	HCL Infosystems Ltd
Thought Works	SIT Mobile	Hyundai	IP Infusion	HCL Technolo

		Motors		gies
Titan	Soliton Technologies	I B	ITC Limited	HDFC Asset Management Company Ltd
TVS	Subex	Igate	Khimji Ramdas	HDFC Bank
UAE Exchange	Sundaram BNP Paibas	IBB	KLA TENCOR Pvt Ltd	HDFC Limited
UAE Exchange	Sundaram Fasteners	IBM (I) Ltd.	Kotak Mahindra Bank Ltd	Hewlett Packard
Ubix Systems Marketing	Tata Advanced Materials	IBS Software	L&T ECC	Hidesign
UBS	Tata International	ICICI Bank	L&T Infotech	Hiland Realty Pvt Ltd
UST Global	Tata Metalics	ICICI Prud AMC	Larsen & Toubro Ltd.	Hindustan Coca Cola Beverages Pvt. Ltd.
Vasan Eye Care	TCS	ICICI Securities	Lister Technologies	HSIL Limited
Virgin Mobiles	TCS BPO	IDBI Bank	LMS India Engineering Solutions	IBM India Ltd.
Vodafone	Thomas Cook	India Infoline	Lucid Imaging	ICICI Prudential
Welset Extrusions	Thought Works	India Vision	Madras Cements Ltd	ICICI Securities Ltd
Wipro	Titan Industries	Indus Ind Bank	MaFoi	Idea Cellular Ltd
Wipro	Toshiba Embedded Software (India) Pvt. Ltd.	Infosys Technologies	Mahindra & Mahindra	i-Gate
Wrigleys	Tractor & Farm Equipment	Infotech Enterpr	Mahindra Satyam	Ikya Human Capital

		ises		Solutions Pvt Ltd.
Zensar Technologies	UBI	IP Infusion	Mangalore Chemicals & Fertilizers Ltd.	Impulse Advertising (PTOE)
	Ucal Fuel Systems	Irevna	Manjadikuru Film	In Creations
	UST Global	Khimji Ramdas-P&G	Marine Biz Channel	Indecom Global Services(PTOE)
	Valgen	Kotak Bank	Media Cloud	Indiamart
	Veasons Energy Systems	KPIT Cummins	Medical Trust Hospital	IndusInd Bank Ltd
	Videocon	L&T ECC	Microchip Technology	Infosys BPO
	Welset Extrusions Ltd.	L&T Infotech	Microsoft	Infosys Ltd.
	WinWinD Power Energy	Lakshore Hospital	Mistral Solutions	Infotech Enterprises
	Wipro	Lakshmi Plastics	Mother Dairy	InterGlobe Technology Quotient Pvt Ltd
		Larsen & Toubro	Mu Sigma Business Solutions	Irelays
		Lister Technologies	Muthoot Mini	ITC Limited
		LMS Emmes kay	Mytrah Energy Ltd.	Jamboree Education Pvt. Ltd.
		Madras Cements	NCBS	Janmabhumi
		Mahindra & Mahindra	NeST (Network Systems & Technologies	Jaro Education

			(P) Ltd.)	
		Mahindra Finance	Nestle	Johnson & Johnson
		Mahindra Satyam	Newsire 18	Jones Lang Lasalle
		Mannapuram Finance	Nomura	Juniper Networks
		Marine Diz	NSH	Karur Vysya Bank
		Maveric Systems	NTT Data Global Delivery Services Ltd	Khazana Jewellery Pvt. Ltd.
		Metro Vartha	Omnex	Khimji Ramdas
		Microsoft	Optio Logic Technologies	KLA TENCOR
		MindTree Ltd.	Pandemonium	Kotak Mahindra Bank
		Mother Dairy	Payoda Technologies	KPIT CUMMINS
		MPDPIP	Polywood Profiles Pvt Ltd	KPMG
		Mphasiss Ltd	Preethi Kitchen Appliances	L & T Infotech
		Muthoot Finance	ProdEx Technologies Pvt Ltd	L&T Construction Ltd.
		Mycolo gy Inst	Publics Ans Firm	L&T Integrated Engineering Services
		National Instruments	Quadrant, Qatar	Larsen & Toubro Ltd.
		NCBS	R R Donnely	Lister Technolo

				gies (P) Ltd.
		Nestle India Ltd	Ramco Systems Ltd	LMS India Engineering Solutions Pvt Ltd.
		New Indian Express	Real Consulting	Lucid Imaging
		Nicholas Piramal	Reckitt Benckiser	Madhyam TV
		NIMS	Renault Nissan Technology & Business Centre	Madras Cements Ltd
		Nomura	RM EDUCATION	Mahindra & Mahindra
		NSH Corporation	Robert Bosch	Mahindra Finance
		Ntrois Technologies	Saggezza India Pvt. Ltd.	Marine Biz TV
		OBS	Saint Gobain	Mast Global
		OPI	Sanmar Engineering	Maveric Systems
		Patni Computer Systems	Santa Monica	Maya Studios
		Payoda	SAP Labs	Media One
		Philips Electronics	Seventh Vision Pvt Ltd	Medical Resources India Pvt. Ltd.
		Ournam Infovision	Shoba Developers	Microsoft India
		Qwest Telecom Service	Siemens Ltd	Mother Dairy

		s		
		Raj TV	Soliton Technologies	MRF
		Ranbaxy	Sourcebits Technologies	Mu Sigma Business Solutions Pvt Ltd
		Rane TRW Steering Systems	South Indian Bank	National Instruments
		Reliance	Subex Ltd.	Naukri.com
		Reliance Power	Sundaram BNP Paribas	Neeeyamo
		Robert Bosch	Sundaram Finance Ltd	NewAge Sys Solutions (P) Ltd
		RRL	Sundram Fasteners Ltd.	Nokia India (P) Limited
		Saint-Gobain Glass (I) Ltd	Surya TV	Nokia Siemens
		SAP Labs	Suyathi Technologies	North Gate Arinso
		SBI	Tally Solutions	NTT DATA Global Delivery Services Ltd.
		Shives Centre - Spastics	Tata Elxsi Ltd.	OMNEX
		Siemens Ltd.	TCS	Payoda
		Soliton Technologies	TCT Consultants	Poornam Infovision

		South Indian Bank	Tech Park Tvm	Pricol Technologies Ltd
		Subex Systems	Technip India	ProdEx Technologies Pvt Ltd
		Sundaram Fasteners	Technovents(E Lakshya)	Punjab National Bank - Metlife India Insurance
		Sundaram Finance	Thomas Cook	Radio Mango
		Sunlux Technologies	ThoughtWorks Ltd.	Rane
		Suntec Business Solutions	Time Analytics	Raymond
		Suprashesh	Times of India	Reliance Money
		Suraksha KSACS Project	Titan Industries Ltd.	Renalyx Health Private Limited(PTOE)
		Surya TV	Toyota Kirloskar Auto Parts	Renault Nissan Technology & Business Centre India (P) Ltd.
		Syntel Ltd	UAE Exchange, UAE	Robert Bosch Engineering and Business Solutions Ltd(PTOE)
		TAFE Ltd	UBIX	Royal Bank of Scotland

		Tally Solutions	Unisys Global Services	S&T Interiors and Contracting (I) Pvt Ltd.
		Tata Advanced Materials	UST GLOBAL	SAFRAN
		Tata Consultancy Services	Vodafone	Saint-Gobain Glass India
		TATA ELXSI	WaterHealth (I) Pvt Ltd	Saltmango CMC Pvt Ltd
		TCS eServe	Wheels India Ltd.	SAMSUNG
		The Leela Group	Wipro	Sanmar Engineering Technologies Ltd.
		Therma x Ltd	Zoho Corporation Pvt ltd	SAP LABS India
		Thomas Cook		School of Digital Cinema
		Titan Industries		Shoppers Stop Ltd
		Toyota Kirloskar		Skanray Healthcare
		Tranont		Skava Systems
		TVS Electronics		Soliton Technologies
		UAE Exchange		South Indian Bank
		UCAL Fuel System		Star Soft

		s		
		Union Bank of India		Sundaram Fasteners Ltd
		UST		Sundaram Finance Ltd
		Videcon Industries Ltd		SunTec Business Solutions
		Web India 123		Synopsys India (P) Ltd.
		Wheels India Ltd		Tata Technologies
		Wipro		TCS
				TCS - BPO
				Technip India Ltd.
				The New Indian Express
				Thorogood
				Thought Works Technologies (P) Ltd.
				Time Analytics
				Tismo
				Titan Industries
				Torry Harris Business Solutions
				TPF Software
				Trident
				Trivone,

				Bangalore
				UAE Exchange
				UST Global
				V - Opt
				Verizon
				Vodafone
				Voltas Ltd
				WaterHealth India Pvt Ltd
				Web India 123
				White Screen
				Wipro
				Writer Corporation
				ZOHO Corp.

### Alumni Association - Activities and Contributions to the development of the university

Yes. We have an Alumni Association. There is a website <http://alumni.amrita.edu> and web portal for all Amrita alumni to keep in touch with their colleagues and also keep other Schools posted of their multifarious achievements.

The Alumni Association of our School meets at least once in a year in the campus and discusses the various initiatives for the benefit of the parent institution.

Alumni are involved in providing feedback on the curriculum and act as a bridge between industry expectations and academic requirements. They also raise funds to help the needy ones.

Alumni have opened up chapters at various cities in India and abroad. For example, there is a very active Amrita alumni chapter with over 200 members in USA. Apart from the regular networking of alumni, the USA chapter is actively involved in the humanitarian projects of the Mata Amritanandamayi Math like Mother's Kitchen – Providing free meals to the needy etc.

Annual Alumni General Body Meeting will be held during third Sunday of February. Guidance to Higher studies, provides information on various opportunities for job and higher studies.

A network of the alumni associations of all Schools and Campuses is created by name *A3 (AMRITA Alumni Association)*.

The alumni have contributed funds for instituting merit cum means scholarships for our students. Certain alumni, who have worked in organizations of repute outside for a few years or did their higher studies in Institutions outside have come and joined our School as faculty and in administrative capacities. Some alumni are also helping in getting internships for our students in various organizations. Many suggestions are provided by our alumni on the curriculum and conduct of the courses/programmes.

#### **Student grievance redressal cell**

The following mechanisms take care of the grievance of students to a great extent.

- Student counselors
- Class committee
- Student welfare department

Suggestions and grievance boxes are kept in various locations wherein the students can post their grievances. These are checked periodically and taken up by the student welfare department. In addition, the student counselors / class committee receives grievances from the students and they categorize the problem and submit the matter to the Dean. The Dean along with the student welfare department takes it up with the management and solves the issue. Once the grievance is addressed, periodic re-assessment is done to ensure the correctness of the solution.

It may be noteworthy to mention that students feel free to meet their Professor in-charge of students' welfare and express their grievances.

Every student in the School has free access to all authorities including the Chancellor of the University.

#### **Gender-sensitization**

The faculty members and the student's welfare department provide counseling for women students, whenever needed. Sometimes legal literacy is also covered during random counseling to the necessary women by the department of student's welfare.

The university conducts Amrita International Conference of Women in Computing. A series of interactive sessions on women empowerment is also conducted (first two sessions were held on 8<sup>th</sup> March 2013 and 6<sup>th</sup> May 2013).

Measures are available in the School to address the grievances of sexual harassment if any. So far, there was no such case to address, thanks to the ethical values we imbibe. A professional counselor has been entrusted with the responsibility of handling issues related to sexual harassment.

#### **Anti-ragging committee**

It is mandatory that every senior student is required to give a ragging pledge signed by them and their parents in addition to registering themselves in the anti-ragging website <https://antiragging.in> as per the UGC's requirement.

There is an anti – ragging committee. The faculty advisors, counselors and chairperson coordinate and support the student welfare department in all issues

related to ragging.

In the case of fresh students, to avoid issues of ragging and harassment, opportunity is provided after a few weeks in the campus to exhaustively give in writing any difficulty, they may have encountered in the campus. This measure is taken at the class levels and the students need not reveal their identity, while giving such complaints. Such complaints are also analyzed by a group of faculty members to find out whether any harassment has taken place. In certain cases, when such complaints are received, it has also led to the culprits being caught and punished.

**How does the university elicit the cooperation of all its stakeholders to ensure the overall development of its students?**

The student progress report having details of academic performance in tests, attendance and other relevant academic and non-academic matters are sent to parents after each periodical exam. The parents are asked to contact the class advisor / department in person in exceptional cases.

The Centre for corporate and Industrial relations interact with the industry to get the feedback of our students' performance and the feedback is analyzed, shared and discussed with the Dean Engineering, Heads of Department and senior faculty for corrective action where necessary. The feedback is also used to make structural changes in curriculum / syllabi / teaching learning process as appropriate.

**How does the university ensure the participation of women students in intra- and inter-institutional sports competitions and cultural activities? Provide details of sports and cultural activities where such efforts were made.**

The school does not differentiate male students from female students for all curricular, co-curricular and extracurricular activities. It encourages students to participate in technical/non technical events in inter collegiate/university.

The school provides specialized facilities Separate Gymnasium, Basketball court in Girls hostel, separate Halls for practice/rehearsal for cultural competitions for women students

## 5.2 Student Progression

**5.2.1 What is the student strength of the university for the current academic year? Analyze the programme-wise data and provide the trends for the last four years.**

Student Progression	%				
	ASCOM	CHEMICAL	EEE	ECE	MSW
UG to PG*	1	15	12	30	
PG to M.Phil.*		NA	Nil	NA	5.5
PG to Ph.D.		100	3.9	5	18.75
Ph.D. to Post-Doctoral		0		0	
Employed					
• Campus selection		76.5	85	60	
• Other than campus recruitment		10		10	
Entrepreneurs			0.83		

**Programme-wise completion rate**

**Amrita School of Medicine**

100%

**Amrita School of Arts and Sciences, Amritapuri**

<b>Examination conducted</b>	<b>2010</b>		
	<b>Appeared</b>	<b>Passed</b>	<b>Percentage</b>
B.B.M	65	54	83.08
B.Com	46	34	73.91
B.Sc.(PM)- Exit Option	3	3	100.00
M.Sc.(Chem)	14	14	100
M.Sc(Phy)	Nil	Nil	Nil
Five Year Int.M.Sc(Phy)	Nil	Nil	Nil
Five Year Int. M.Sc(Maths)	Nil	Nil	Nil
MSW	22	19	86.36

For 2011

<b>Examination conducted</b>	<b>2011</b>		
	<b>Appeared</b>	<b>Passed</b>	<b>Percentage</b>
B.B.M	73	61	83.56
B.Com	65	52	80.00
B.Sc.(PM)- Exit Option	3	3	100
M.Sc.(Chem)	9	8	88.89
M.Sc(Phy)	4	4	100.00
Five Year Int.M.Sc(Phy)	6	6	100.00
Five Year Int. M.Sc(Maths)	Nil	Nil	Nil
MSW	23	23	100.00

For 2012

<b>Examination conducted</b>	<b>2012</b>		
	<b>Appeared</b>	<b>Passed</b>	<b>Percentage</b>
B.B.M	98	60	61.22
B.Com	47	33	70.21
B.Sc.(PM)- Exit Option	Nil	Nil	Nil
M.Sc.(Chem)	9	8	88.89
M.Sc(Phy)	9	9	100.00
Five Year Int.M.Sc(Phy)	10	8	80.00
Five Year Int. M.Sc(Maths)	Nil	Nil	Nil

MSW	20	20	100.00
-----	----	----	--------

For 2013

Examination conducted	2013		
	Appeared	Passed	Percentage
B.B.M	83	69	83.13
B.Com	59	44	74.58
B.Sc.(PM)- Exit Option	6	5	83.33
M.Sc.(Chem)	15	13	86.67
M.Sc(Phy)	9	8	88.89
Five Year Int.M.Sc(Phy)	8	5	62.50
Five Year Int. M.Sc(Maths)	12	8	66.67
MSW	32	30	93.75

### Amrita School of Arts & Sciences, Mysore

Programme-wise completion rate during the last four years:

Programme	Total no of students appeared for the exam during the last four years	Total no of students awarded the degree during the last four years	% of students who completed the program within the stipulated time span
BBM	175	169	96
BCA	309	286	92
B Com	27	26	96
MCA	178	177	99
M Sc	78	78	100

### Amrita School of Biotechnology, Amritapuri

2008	M.Sc Biotechnology-44 M.Sc Bioinformatics-28 B.Sc Biotechnology-48 B.Sc Microbiology-25
2009	M.Sc Biotechnology-38 M.Sc Bioinformatics-28 M.Sc Microbiology 29 B.Sc Biotechnology-47 B.Sc Microbiology-29
2010	M.Sc Biotechnology-39 M.Sc Bioinformatics-16 M.Sc Microbiology 25 B.Sc Biotechnology-41 B.Sc Microbiology-18
2011	M.Sc Biotechnology-36 M.Sc Bioinformatics-12 M.Sc Microbiology 19

	B.Sc Biotechnology-47 B.Sc Microbiology-37
--	---

**Amrita School of Engineering, Coimbatore**

ASCOM  
 BA 08 – 11 100 %  
 BA 09 – 12 96%  
 BA 10 -13 96 %  
 MA 100%  
 PGDJ 100%  
 Chemical Engineering is 98%  
 ECE- B.Tech - 90% M.Tech - 100%  
 MSW-98%

**Amrita School of Dentistry, Kochi**

98%

**Department of Management, Bangalore**

100%

**Amrita School of Pharmacy, Kochi**

M.Pharm : 100%

B.Pharm: 85%

**Amrita School of Business, Coimbatore**

100%

What is the number and percentage of students who appeared/qualified in examinations like UGC-CSIR-NET, UGC-NET, SLET, ATE / CAT / GRE / TOFEL / GMAT / Central / State services, Defense, Civil Services, etc.?

CHEMICAL- 15 %

ECE

GATE - 25%

GRE/TOEFL – 70%

CAT – 20%

Central /State services/Defense – 2%

MSW-18.75%

Category-wise details regarding the number of Ph.D./D.Litt./D.Sc. theses submitted/ accepted/ resubmitted/ rejected in the last four years.

**Amrita School of Arts & Sciences, Amritapuri**

Awarded PhD to Dr. Sreekala .C.O on 16/9/2012.

Title of thesis: ‘Studies on Organic bulk heterojunction devices for photovoltaic solar cell application’.

**Amrita School of Engineering, Bangalore**

Ph.D. Thesis submitted & accepted

\* S. Nandagopalan, Research Scholar in the Department of CSE

\* T.K. Ramesh, Research Scholar in the Department of ECE

Ph.D. Thesis resubmitted

\* S. Ravishankar, Research Scholar in the Department of ECE

Ph.D. Thesis submitted & pending defense

\* V. Kesavulu Naidu, Research Scholar in the Department of Mathematics

**Amrita College of Nursing, Kochi**

- Theses is applicable only to the Post graduate students (M Sc Nursing)

- So far, only three batch students have submitted the theses as the programme started in the year 2009.
  - Total no: of theses submitted and accepted are 89.
- No theses were rejected or resubmitted.

#### **Amrita School of Pharmacy, Kochi**

Five faculty have submitted their thesis work.

#### **Amrita School of Business, Coimbatore**

The PhD programme in ASB was started in 2009 and is new. So far, no scholar has submitted their thesis.

### **Student Participation and Activities**

List the range of sports, cultural and extracurricular activities available to students. Furnish the programme calendar and provide details of students' participation.

A wide range of sports, cultural and extracurricular activities are made available in all our campuses and schools. Due to space constraints the details are not included here, but are available upon request. A sample of the activities is given below:

Cultural: Classical music & dance (solo, group, vocal, instrumental, various dance forms, etc.)

Sports: both indoor (carom, chess, badminton, etc.) and outdoor (cricket, football, basketball, track events, etc.)

Other: Marketing games, Finance games, etc.

Give details of the achievements of students in co-curricular, extracurricular and cultural activities at different levels: University / State / Zonal / National / International, etc. during the last four years.

Due to space constraints the list is not being included here, but is available in the university – the IQAC coordinator can be contacted for the same.

Does the university conduct special drives / campaigns for students to promote heritage consciousness?

The department of cultural education in each campus has conducted several programs to promote heritage consciousness among students:

- Trips to heritage sites like Brihadeeshwara temple (Thanjavur) and Rameshwaram, Kanyakumari, Madurai, Hampi, etc.
- Awareness campaigns of the nature of essay writing competitions, quizzes, guest lectures by experts in the field, etc.
- Bhagavat Gita summer camps (Geethamritham) conducted every year.
- Observance & celebration of festivals like Gokulashtami and Onam – and their spiritual significance – programs are arranged to raise the awareness among students and staff.

How does the university involve and encourage its students to publish materials like catalogues, wall magazines, college magazine, and other material? List the major publications/ materials brought out by the students during the last four academic sessions.

The literary club “Srishti” brings out a fortnightly wall magazine titled The Clarion. We also have a college magazine called Amritadhwani published annually. It is thirteen years since we have been publishing the magazine and we have been bagging the best magazine award consistently for the past six years.

**Does the university have a Student Council or any other similar body? Give details on its constitution, activities and funding.**

The student community in AMRITA belong to one of the four houses, viz., Amritamayi, Anandamayi, *Chinmayi* and Jyothirmayi . All competitions are held house-wise. At the beginning of each academic year, elections are held after receiving nominations from the students for the post of Captain and Vice-captain. The activities of the houses are monitored by the Department of Student Welfare. The funding for various activities of the houses is provided by the Institute.

**Give details of various academic and administrative bodies that have student representatives on them.**

1. Administrative Committee
2. Admission Committee
3. Alumni Committee
4. Amrita Blood Donors Forum
5. Anti-Ragging Committee
6. Arts and sports committee
7. Class Committee – Two student representatives along with subject teachers handling various courses meet twice a semester to discuss curricular delivery and evaluation pattern.
8. Committee for organizing talks from experts and screening movies and documentaries
9. Editorial team for college magazine
10. Festival committee
11. Health Committee
12. Internal Quality Assurance Cell (IQAC)
13. IQAC
14. Library Advisory Committee
15. Library committee
16. Media Relations Committee
17. Organizing members in Department conference and workshops
18. Placement Coordination
19. Sports Committee
20. Student representatives in Anokha

***Any other information regarding Student Support and Progression which the university would like to include.***

**Student Activities and Achievements**

Highlights have been provided at the end of the Executive Summary Report.

## **CRITERION VI: GOVERNANCE, LEADERSHIP AND MANAGEMENT**

Under the inspiring and able guidance and leadership of the Chancellor, Mata Amritanandamayi, the university has been exemplary in achieving a balanced governance and management approach involving both professionalism and humanism. Under such an approach, effective strategic management practices and policies have evolved, helping the university in effectively achieving the following core values: Participative decision making, Transparency (including involvement of stakeholders), Visionary planning, Spirit of continuous improvement, Team work, Probity in public finance, Tradition of self-audit, and Commitment to fairness.

The various components of the approach are outlined in the sections below.

### **Institutional Vision and Leadership**

#### **Vision**

We envision a world endowed with the wealth of knowledge and the strength of discrimination (Viveka).

We envision a system, which is a healthy breeding ground for the sprouting, culturing and dissemination of the whole gamut of knowledge in a wholesome and holistic manner for the well-being of humankind.

We envision a human being empowered with wholesome knowledge, which makes one an enabler and facilitator in the deep search and striving of every human being for that knowledge.

We envision a system where in there is a great interplay and exchange of ideas, thoughts, feelings and actions which develop people empowered with noble character and wholesome values. They go out into the fields of action to build a world of love, harmony, peace and knowledge. They follow the path of “Dharma” and give a clear direction in every thought and human endeavor.

#### **Mission**

To provide value-based education and mould the character of the younger generation through a system of wholesome learning, so that their earnest endeavor to achieve progress and prosperity in life is matched by an ardent desire to extend selfless service to society, one complementing the other.

As seen above, the mission statement defines the university’s distinctive characteristics in terms of addressing the needs of the society, the students it seeks to serve, the institution’s tradition and value orientations, and its vision for the future. The mission is aimed at achieving, “Education for life”, rather than merely, “Education for living”.

#### **Leadership involvement in ensuring the organization’s management system development, implementation and continuous improvement**

- \* in interacting with its stakeholders
- \* in reinforcing a culture of excellence, and
- \* in identifying organizational needs and striving to fulfill them.

- With primary stakeholders identified as the students, parents, employers, and the community at large, the administrative leaders of the university make continuous efforts to conduct self-assessment, with the objective of establishing a culture and environment of continuous improvement in all aspects of the university's functioning.
- The IQAC plays an important role in this matter, and the university's IQAC coordinator is member of the university's Academic Council. The IQAC makes constant and continuous efforts towards self-assessment, culminating in the Annual Quality Assurance Report (AQAR) submitted to NAAC. The findings of the IQAC are regularly taken up for deliberations and follow up action at various levels: department-level, school-level, and university-level. Inputs from students (through student feedback mechanisms), parents (through college visits and emails), and employers (informally through faculty members' contacts with employers' representatives, and formally through the department conducting a survey or through the university's CIR – Corporate & Industry Relations department), are regularly sought, obtained, analyzed, and improvement actions are undertaken where appropriate – in terms of updates to policy changes, management strategies, administrative processes, academic transaction processes, infrastructure & facilities, etc.
- The involvement of leadership & IQAC has resulted in continued growth and excellence – for which a few examples are given below:
  - Progress in research (reflected clearly in the number and value of research grants, publications, and development of products beneficial to society)
  - Development of new pedagogical approaches
  - Creation and implementation of streamlined and efficient processes and mechanisms for teaching, learning, and evaluation
  - Attraction of talented teaching and research staff, and collaboration with leading organizations across the world
  - Greater success in student mobility (reflected in the success of students opting for higher studies in prestigious institutions in India and foreign universities, as well as through placement in leading companies in India and abroad)
- The dedication and commitment of the management, and the recognition of Amrita in the community (and the world at large), are evident from the fact that none of the leadership positions have ever been vacant for any extended period of time.
- With its complex structure of constituent schools, university departments, and research centers, spread over five campuses and three states, it has been necessary to have an effective organization structure. This has been achieved, and the various organizing committees (at the department, school, campus, and university levels) meet on a regular basis, establishing accountability through good documentation practices and clear communications, ensuring that all the functional and quality improvement activities involve participation across all levels of the university (students, teaching staff, non-teaching staff, and administration).

- One of the strengths of the university is the easy access to university management, including access to the Chancellor, for all the staff and students, throughout the year.

Thus, it may be noted that the university has achieved and established a strong culture and tradition of participative management.

#### University's approach for grooming leadership at various levels

The institutional leaders work with the human resource department to determine strategies for development of leadership skills among faculty and non-teaching staff at various levels. This is done by entrusting the staff members with specific roles and responsibilities, providing the support of mentors wherever appropriate – some examples are given below.

- Class advisers and counselors
- Organizing and coordinating technical events (conferences, seminars, workshops, FDPs, etc.)
- Organizing and coordinating non-technical events (student orientation, staff orientation, festivals and cultural events, convocation, institution day, alumni meets, etc.)
- Coordination and leadership in academic and administrative processes and transactions (class committee, course committee, UG Programs committee, PG Programs committee, timetable committee, calendar committee, invigilation committee, exam cell, admissions & counseling committee, academic coordination, course mentorship, etc.)
- Coordination for IQAC (at department, school, campus, and university levels)
- Coordination of research (patent cell, research committee, internal funding review committee, etc.)

#### University's knowledge management strategy

In the current context, “knowledge management”, is interpreted as comprising two main components: knowledge creation and knowledge sustenance.

The strategies for knowledge creation include fostering a strong research culture, with incentives and rewards based on productivity. As a specific example, the university has undertaken a commitment to contribute strongly in the three areas of water, waste, and energy. Additionally, directives have been issued linking research output and salary/promotion considerations. Another strongly established tradition is that of regularly organizing national and international conferences and seminars, drawing expert resources across various disciplines, and paving the way for collaborative projects as well as currency and relevance of curricula in all the university's programs.

Knowledge sustenance is achieved in terms of internal sharing via FDPs and workshops, and information/data management via in-house sophisticated systems: Amrita University Management System (supporting end-to-end university management services, including academic transactions, student & staff welfare, registration, course management, content management, evaluation, etc.), VIDYA (digital repository of e-content), AVIEW (management of online courses and lecture contents), participation in Shodhganga project (through INFLIBNET), etc.

### Values reflected the functioning of the university

#### \* **Contributing to national development**

Recognition of the university's potential, and past contributions of national importance, has come in terms of government agencies (e.g. MHRD) & foreign organizations (e.g., UNDEF, WINSOC/European Commission) entrusting significant responsibilities on the university and awarding projects as part of various missions. Additionally, the university on its own takes up numerous projects (research & development) with immediate social benefits. Some of the most significant contributions are given below:

- Remote sensing for prediction of landslides (Munnar-Kerala, Himalayan region)
- Women's empowerment through vocational education and training
- Telemedicine for rural areas
- Village adoption
- Disaster relief (participation in relief efforts in the aftermath of tsunami, floods, earthquake, etc.)
- Amala Bharatham ("Clean India" – awareness and clean-up campaigns)
- AVIEW (promoting technology enabled learning and outreach to communities and institutions that are lacking access to qualified teachers)
- Virtual labs
- Adaptive Learning (innovative pedagogical styles and tools for enhancing learning among school students across the nation)
- State-of-the-art research centers / centers of excellence (Nanosciences, Photovoltaics & Solar Energy, Biomedical Engineering & Biosensors, Cyber Security, Remote Sensing, Virtual Labs, Haptics-based vocational training & education, Advanced Materials & Green Technologies, etc.)
- 1400-bed Super Specialty Hospital providing free treatment to lakhs of patients

#### \* **Fostering global competencies among students**

The graduates of Amrita University are regularly proving their acquisition of global competencies and competitiveness in several ways:

- Selection for exchange programs,
- Admission to prestigious universities abroad,
- Student participation and winning prizes in international competitions (industry sponsored events, paper presentations, poster presentations, problem solving, design, etc.)
- Employment in multinational companies, and
- Technical contributions, of high standards in scholarly publications and events.

#### \* **Inculcating a sound value system among students**

Service to society is an integral part of a student's life at Amrita. There are boundless opportunities for developing a deep sense of social responsibility, and these are taken up enthusiastically by students, as evidenced by their

participation in the outreach and volunteering activities organized by the university (such as the Amala Bharatham and Sabarimala cleanup and awareness campaigns, disaster relief activities, village development activities, etc. ). Additionally, in alignment with the university's vision and mission, the delivery of education is rooted in a sound value system implemented in various ways (cultural education courses, participation in festivals such as Guru Poornima and Gokulashtami, courses on self-awareness and personal growth, courses on life enrichment skills, and courses on sustainability and environmental consciousness) – all these serving to develop a deeper understanding of the Indian culture, heritage, and ethos in the students' minds.

**\* Promoting use of technology**

The university strives to employ the latest technologies towards delivering high quality education. Some examples are given below.

- AVIEW – an online E-learning system that provides vast opportunities for increased outreach of high-quality teaching across the nation; funded by MHRD (as part of the government's National Mission on Education using ICT).
- Virtual Labs – developed by the university based on funding from MHRD, to provide a near hands-on experience of experimentation related to science and technology.
- Amrita University Management System (AUMS): A comprehensive software system that covers all aspects of the university's functions and transactions – developed in-house by the university.
- AMMACHI Labs – development of vocational training & education packages based on Haptics technology, targeted at women's empowerment (funded partly by UNDEF & MHRD).

**\* Quest for excellence**

Considering its young age, the university has achieved unprecedented growth and excellence. This has been made possibly by the visionary leadership of its Chancellor, Mata Amritanandamayi, who has inspired a large pool of talented and highly motivated individuals to take up various positions of responsibility and challenge, creating an environment that has no tolerance for complacency in terms of its achievements or standard of education. Every functional unit (right from the housekeeping services, all the way to the academic council) conducts its transactions with a keen spirit of continuous improvement. A small sample of the myriad ways in which this quest for excellence is reflected in the university's performance is given below:

- Over 180 crores INR obtained in research grants
- More than 3000 publications in journals and conference proceedings of repute
- Excellent placement record
- Recognition by employers and community for the value-based education delivery
- Attraction of talented and committed teaching and research staff from across the world
- One of the best infrastructure and facilities among all the higher education institutions in India

- Large number of MoUs signed with prestigious world-class institutions and industrial organizations
- Increasing mobility of students to world-class institutions (in India & abroad) for higher education

## **Strategy Development and Deployment**

### **Perspective plan for development**

#### **\* Vision and mission**

The process of creating a university perspective plan is as follows. Each department (within a school) is instructed to prepare their five-year plan (including budgetary details & projections). To the set of these within each school, additional school-level components are added to the plan, to meet common and collective requirements such as those of infrastructure and facilities, policy changes, increase in human resources, etc. The university level perspective plan is then created based on the inputs from the schools. These are done in close alignment with the vision and mission of the university.

#### **\* Teaching and learning**

New pedagogical styles (such as blending learning, MOOCs, , open labs, etc.), as well as use of new technologies (ICT-enabled) are constantly evaluated for adoption in the right areas and program levels. Course management and classroom transactions are always being evaluated, based on various internal audit mechanisms, including student feedback on the quality of the associated process – the perspective plans include solutions for the gaps identified through such audits.

#### **\* Research and development**

The focus of research and development, ably strategized and guided by the Chancellor, is on providing low-cost, high-tech, effective solutions to the most pressing societal problems. Thus, currently, the R&D efforts are being channelled towards problems related to water, waste, and energy. Additionally, recognizing the huge gap in the nation with respect to access to good quality higher education, there are significant efforts towards ICT-enabled solutions for e-learning and distance education. The R&D component of the perspective plans are thus developed with this focus.

#### **\* Community engagement**

This is the very basis and foundation of the Mata Amritanandamayi Trust, and therefore, forms an integral part of the university's focus as well. Service to society is being practiced in delivering to the needs of the country (and local community) through high quality education delivery, social service, inculcation (& dissemination) of values, development and delivery of solutions to the most pressing needs of the society, and in being a role model for higher education institutions.

#### **\* Human resource planning and development**

The university leadership has never been satisfied with merely matching faculty strength to the teaching work load. Instead, whenever talented and highly motivated applicants express interest, the faculty appointment committees are instructed to go through the normal process of evaluation, and if found to meet/exceed the recruitment criteria, they are hired. This allows the

various schools to plan futuristically, and constantly raise the bar (of quality) for themselves.

\* **Industry interaction**

This component of the perspective plan is aimed at improvement in the following areas: placement in specific areas of study (“core” placement), R&D based on industry’s needs, increased “employability” and “deployability” of graduates of the university as per industry’s requirements, curricular design changes based on industry feedback, summer training and internships, curricular projects focused on industrial problems, etc.

\* **Internationalisation**

As the policies and strategies are developed in a wholly participative and inclusive way, internalisation has not been a challenge. Staff and students are involved in all aspects of the functioning of the university, and there are no barriers in terms of communicating critical feedback on existing processes and mechanisms – hence, there is a healthy work environment that has made it possible to implement quality improvement in both top-down and bottom-up ways.

**University’s internal organizational structure and decision making processes and their effectiveness**

There are various committees formed with specific roles and responsibilities, reporting to either the department, school head, vice-chancellor, or academic council. A partial list is given below, as a sample.

- UG Programmes Committee
- PG Programmes Committee
- Faculty Appointments Committee
- Research Activities & Programmes Committee
- Admissions Committee
- Library Committee
- University Women’s Cell
- Timetable Committee
- Calendar Committee
- Internal Research Review Committee
- Specific Event-based Committees (Gokulashtami, Faculty Cultural Camp, ANOKHA, etc.)

**Hierarchy for day-to-day academic duties:** Chairman->Vice-Chairman->Year Coordinators -> Class Advisor -> Class Counselors->students representatives.

**Hierarchy for Research and workload allocation duties:** Chairman->Vice-Chairman-> Research Group Heads -> Research group members.

**Hierarchy for Dept. level policy decisions:** Core committee comprised of Research Group Heads and Chairman’s nominees, advises the Chairman.

**Quality Policy – design, deployment, and review**

This is mainly addressed through the IQAC, but in specific cases (for e.g. in Medical School), other methodologies are taken up, such as, ISO certification and audits. The university has an established tradition of the IQAC’s

involvement at the department, school, campus, and university levels, and this enables gap analysis, creation of corrective action plan, implementation of corrective actions, and follow up with re-assessment to monitor the efficacy of the corrective actions.

#### [Does the university encourage its academic departments to function independently and autonomously and how does it ensure accountability?](#)

Academic departments have the freedom to manage their programs within the existing framework, conforming to the policies, rules, and regulations laid down for

How does the university ensure that grievances / complaints are promptly attended to and resolved effectively? Is there a mechanism to analyse the nature of grievances for promoting better stakeholder-relationship?

#### **Student Grievances**

Complaints/grievances of the students are directed to the respective class counselors and advisors. If the issues cannot be resolved at that level, they are brought to the attention of Chairman / Vice Chairman of the department, and if necessary, escalated further to the attention of the school head / campus head. In the case of critical issues, the school head or campus head sets up a committee to resolve each specific issue.

Grievances/complaints can also be raised during the class committee meetings.

#### **Staff Grievances**

Grievance cell has been established in each campus. Minor issues, if any, are taken up in the department, and escalated through the grievance cell if needed. Additionally, in a proactive measure, the school head may constitute a committee to visit each department and formally collect feedback from staff (both teaching and non-teaching), consolidate for the school, and pass on to the school head for corrective actions.

#### [Mechanism for analyzing student feedback on institutional performance](#)

Feedback is obtained on various aspects: hostel, food services, campus life, teaching-learning, curriculum, etc. The analysis and corrective actions are handled by the concerned departments, after consultation with the specific management team (campus head, school head, general administration, department head, etc.).

#### [Conduct of performance audit of the various departments](#)

When the IQAC coordinators prepare collect data and prepare the AQAR each year, the information is reviewed by a team of the department head and senior faculty, for any follow up actions. Additionally, there are mechanisms in place for the school head (supported by HR, Admin, etc.) to audit the departments with respect to the following:

- Teaching performance
- Student performance (results analysis is done and reviewed, several times during the semester)
- Student attendance

- Department expenditure
- Staff leave availed
- Research output

### College Development Council (CDC) / Board of College and University Development (BCUD)

Based on discussions at the academic council, with inputs from various committees, as well as based on the perspective plan, the management along with the Planning Board, under the guidance of the Chancellor, undertakes the task of planning the university development, and deploying task forces to implement the plan. Success is evident in the tremendous growth of the university in the last ten years, in terms of new programs, placement, infrastructure & facilities enhancements, student performance, alumni achievements, research output, public image of the university, and the social contributions.

### Faculty Empowerment Strategies

The university management provides numerous opportunities and platforms for faculty development.

- Faculty development programs are regularly conducted by the university on various topics – and the departments for whom the program is relevant work together to organize the event.
- Faculty members participate in FDPs held at Amrita, but organized by other institutions (e.g. IIT-Mumbai workshops conducted nationwide through AVIEW, with Amrita campuses also participating)
- Faculty members are sponsored for attending FDPs conducted by institutions outside Amrita
- Faculty members sponsored for attending technical conferences/workshops/seminars held outside Amrita
- New faculty orientation conducted at Amrita
- Special training conducted by Amrita for faculty members across the university teaching common subjects (e.g., Engineering Mechanics, Environmental Studies, Principles of Management, etc.)
- Faculty exchange programs with top universities outside India (e.g., Aalto University – Finland; KTH University – Sweden, Deakin University – Australia, etc.)
- Structured and comprehensive faculty performance appraisal and development system based on teaching, research, administrative, and community engagement contributions
- Mentorship and co-teaching for inexperienced faculty
- On campus teaching excellence workshops (e.g., Mission 10X)
- Allowing faculty to pursue PhD in other prestigious institutions in India and abroad

**NOTE:** Periodic reviews of appraisal methods for teachers have resulted in several improvements: Adjustment of faculty workload based on their commitment to administrative or other duties; Annual faculty cultural camp to provided a spiritual recharge, appreciation for our rich cultural heritage, and

practical knowledge relative to applying values in teaching, research, and other duties.

#### **Non-teaching staff development**

Training has been conducted for non-teaching staff to provide opportunities for updating their professional skills, in departments such as ICTS, Library, and Administration (including training on software, document writing, etc.).

#### **Welfare schemes for teaching and non-teaching staff**

- Staff members are provided with normative welfare schemes such as health insurance, medical care, staff quarters, campus amenities (stores, child care services, etc.), provident fund, maternity leave, sabbatical leave, etc.
- Amrita University has gained recognition in India and abroad. Thus, we continue to draw highly qualified applicants for faculty positions throughout the year. Through press releases and advertisements in various media, vacancies are announced to the public, and the applications taken up for the prescribed screening process.
- In many ways, the university has become recognized as a place for shaping the professional careers of the staff that join, and therefore, the faculty members that have absorbed the culture and professional ways of the university are in great demand in the outside world.

#### **Gender Sensitization & Women's Welfare**

The university places great value on gender sensitization and women's empowerment – these are reflected in numerous activities and actions taken over the years:

- Establishment of University Women's Grievance Cell
- Conduct of International Conferences for Women Scientists
- R&D projects undertaken focused on women's empowerment through vocational training & education (partly funded by UNDEF)

#### **Financial Management and Resource Mobilization**

##### **Institutional mechanism available to monitor the effective and efficient use of financial resources**

The university conducts periodic and regular reviews of the expenditure associated with various functional aspects (purchases, infrastructure upgrades, maintenance, etc.), led by the office of the pro-chancellor. All new budgetary requirements submitted are also taken up for regular and detailed review by the office of the pro-chancellor.

##### **Mechanism for internal and external audit**

Yes, the university conducts regular internal audits of the finances and accounts. Robust systems are in place with respect to processes for approvals

for any monetary transactions associated with the university. Care is taken to maintain clear and accurate audit trails for all the transactions.

External audits are conducted on a regular basis for the university's balance sheets, by a certified accounting firm.

**Have the accounts been audited regularly? What were the audit objections, if any, and how were they complied with?**

Accounts are audited regularly, and there have been no objections to date.

**Provide the audited income and expenditure statement of academic and administrative activities of the last four years.**

The statements are attached at the end of the report (Annexure 1).

**Narrate the efforts taken by the university for resource mobilization.**

The university has made tremendous strides forward in terms of resource mobilization through research grants from funding agencies. Since the 1<sup>st</sup> cycle of accreditation in 2008, over Rs. 140 crores by way of research grants have been obtained by the university.

The other avenue for resource mobilization is via collection of fees.

**Is there any provision for the university to create a corpus fund? If yes, give details.**

The university receives corpus funds from the parent body, Sri Mata Amritanandamayi Trust.

### **Internal Quality Assurance System**

A separate section, containing a detailed report of the quality sustenance and quality enhancement activities of IQAC has been provided in this RAR (Re-accreditation report).

Our plans regularly have a basis on continued enhancement and excellence with respect to the following:

1. Procedures to ensure smooth functioning of the university's day-to-day administration – with transparency, reliability, comprehensiveness, and clarity.
2. New degree programmes to meet current and future needs of society and industry.

3. Innovation to enhance the teaching-learning process – learning from national and international best practices.
4. Achieving faster growth and excellence in research.
5. Conduct of, and participation in, faculty development programmes.
6. Outreach to the scientific community, via technical and non-technical seminars/conferences/workshops.
7. Expansion of its infrastructure with respect to buildings, library facilities, computing facilities, laboratories, etc.
8. Links to recognized international and national academic institutions, industries, and Centres of excellence.
9. Participation in co-curricular, extra-curricular, and community service activities among students.

## **CRITERIA VII: INNOVATIONS AND BEST PRACTICES**

### **Environment Consciousness**

Our Chancellor is one of the greatest protagonists of environmental protection and sustainable living.

The university has been taking various steps towards keeping its environmental footprint to the minimum ever since it came into existence.

All undergraduate students study a 4 credit course Environmental Studies with a lot of focus on hands-on experience and project work. They are engaged in finding innovative solutions to our environmental problems.

The university is also actively engaged in discussions to make Amrita a Green campus with the support and guidance of Vivek Gilani, Director (Strategy, Research & ERP Services) cBalance Solutions Hub, Bangalore (URL: <http://cbalance.in/case-studies/> )

In addition, at the behest of our Chancellor, we are going to offer an Open Elective for all the engineering students during their final semester on the subject of Sustainable Development.

Thirdly, the university has initiated research in the area of sustainable development. The university has been actively seeking the participation of the faculty in reducing our water, energy and waste foot print. The university is privately funding projects that reduce environmental pollution and GHGs.

Many of our faculty members are engaged in research projects which when completed will have contributed to reducing environmental pollution on a very large scale.

### **Miraculous Evolution of the Ettimadai (Coimbatore) Campus**

The environmental activities of the Ettimadai Campus of Amrita Vishwa Vidyapeetham University commenced in the year 1992 in the newly purchased land through protection of existing trees and water and soil conservation. The tree planting programme initiated in 1995 was intensified from 1999 with the establishment of Centre for Environmental Studies. The mission of the Centre is to develop technologies that are environmental friendly, economically sound and socially relevant. The Centre actively promotes sustainable development based on community needs and works to create awareness among people regarding equitable use of natural resources, conserving and nurturing biological diversity, gene pool and other resources for long term food and health security. By the year 2010 about 1 lakh of trees belonging to 210 species were planted in the campus and the UNEP (United Nations Environmental Programme) issued to the Centre an appreciation certificate for this achievement as a part of the 1 billion tree planting programme.

The transformation of the campus from a virtual desert to an evergreen land is often described as a miracle. The Wall Street journal of New York described the campus as the most picturesque campus in India. The activities of the Ettimadai campus are not confined to tree planting and forest protection alone.

Liquid and solid waste management is another important activity of the Centre. The campus has established composting units including vermicomposting utilizing the leaf litter, food waste and other degradable wastes generated in the campus. Around 13 lakh liters of waste water released everyday from hostels, residences, canteens and other sources are fully recycled through bio-remediation and utilized for a horticulture and gardening. The Campus is fully organic. Rain water harvested from roof tops and from the fields is collected in small and large pits and allowed to percolate down to recharge sub-surface water sources.

The accomplishments of the Centre are:

- Developing a tree planting and conservation technology that can serve as a model for greening of semi arid low rainfall areas.
- Establishing a multi-tier medicinal garden consisting of medicinal trees, shrubs, and herbs, which can be adopted by farmers in the region.
- Standardizing techniques for in situ conservation of medicinal plants and their propagation, which was made possible through a project funded by Central Medicinal Plants Board, Government of India. A good collection of medicinal plants is maintained.

### **Research Projects:**

Projects funded by the Coconut Development Board and Ministry of Environment and Forests, Government of India.

Ongoing projects include:

- Inventory of vegetation with special reference to medicinal and aromatic plants and documentation of traditional knowledge in the Walayar Valley, Western Ghats
- Improving coconut production in Kerala using soil data through Remote Sensing and GIS techniques
- Events:
  - Environmental Awareness Campaign on ‘Solid waste management’, in June 2005, supported by Ministry of Environment and Forest, Govt. of India
  - International symposium on ‘Healing Across Cultures’, in July 2007 in association with Cleveland State University , Ohio, USA
  - Activities of Amrita Prakirithi Samrakshana Samiti, a Nature Club of the University

### **Initiatives taken by the university to make the campus eco-friendly**

#### **a) Energy conservation :**

- Regular Awareness campaigns
- Planned power shutdowns in hostels during periods of low occupancy.
- Phasing out of incandescent lamps and partial phasing out tube-lights in favor of CFLs.
- Minimizing of air conditioner use through management controls

#### **b) Use of renewable energy**

See use of firewood below

#### **c) Water harvesting :**

Seepage pits near the academic blocks to collect roof drainage.

Large scale tree plantation has improved ground percolation of rainwater.

Partial terracing of the land has reduced surface runoff.

**d ) Check dam construction**

Several check dams have been constructed on streams originating in the neighbouring mountain. There are periodically desilted and maintained.

**e ) Efforts for Carbon neutrality**

Large scale tree plantations within campus and in neighbouring village.

Use of firewood for part of the kitchen boiler heating needs (campus grown wood is carbon neutral)

**f ) Plantation**

Please See above

**g ) Hazardous waste management**

The only hazardous waste that we generate are from the chemicals that are generated during the regular lab experiments involving the ordinary chemicals used in the UG studies. These chemicals are collected in separate containers and discharged at the engineered land sites.

**h ) e-waste management**

Collection, segregation and sale to buyers in the city.

We are also planning to recover the precious metals (mixed metals without separating them into individual metals) from the PCBs (e-wastes) and convert them into jewelry using the skills of the local artisans. This process will involve minimum consumption of energy, minimum generation of chemical wastes, minimum capital investment and use of locally and abundantly available skills of the artisans. We are also planning to convert this mixed metal waste into coins (monetary instruments) so that all the governments all over the world can use this application for the conversion of the mixed metals recovered from the PCBs with minimum environmental impacts.

**i) any other (please specify)**

- Preserving local plant biodiversity
- Creating awareness about local plant biodiversity
- ETPs and use of reclaimed water for gardening
- Minimal pesticide and agrochemical use on campus

## **Innovations**

A number of research innovations have been listed in earlier sections, such as the work done in AMMACHI Labs, Virtual Labs, E-learning Labs, CREATE Labs, etc.

Three innovative practices are presented as examples of the university's continuous efforts towards quality improvement in applied research, teaching, and administrative aspects.

### **1. Deployment of Landslide Monitoring System in Munnar**

The devastation and loss of life caused by landslides affects hundreds of people every year around the world. Amrita Vishwa Vidyapeetham developed and deployed India's first-ever landslide detection system using a wireless sensor network at Munnar, Idukki, Kerala, India. The deployment site chosen was highly prone to landslides due to systemic monsoon-induced rainfall in the region.

Geological and hydrological field data received from the geophysical sensors deployed in Munnar were transmitted through a wireless sensor network, using a two layer hierarchical topology.

A unique feature of this landslide detection system was that it used heterogeneous network that includes wireless sensor networks in combination with Wi-Fi and satellite technology. In addition, it brought together experts from the fields of mechanical engineering, electrical and electronics engineering, computer science and engineering and geological sciences.

## 2. Peer Evaluation

- **Title of the Practice:** Peer Evaluation in **Amrita School of Arts & Sciences, Amritapuri**

We conduct peer evaluation of the lecture classes of all faculty members twice in a semester. The lecture of each faculty member is evaluated by two other faculty members of the department. All the members of the department are involved in the process.

- **Objective of the Practice:** The objective of the ‘best practice’ is to improve the quality of the lecture classes and also to point out and rectify defects, if any, so as to make the classes more effective.
- **The Context:** The young faculty members get good opportunity to share the experience of senior faculty members in teaching. This will help them to develop a good teaching methodology. The weakness or defects, if any, can be rectified. The overall performance of the Department can be improved. A cordial relation among the faculty members can be developed.
- **The Practice:** Two members of the faculty will make the evaluation of the lecture class of each faculty member. Prior information will be given to the members. Also all the members will involve in the process of evaluation. The evaluation team will submit a report of the evaluation to the Head of the Department. The Head of the Department will make detailed discussion with the concerned faculty about the report. This will enable the faculty to take necessary changes, if any, in the teaching method.
- **Evidence of Success:** The regular increase in the TEI score of most of the teachers is a clear evidence for the success of the practice.
- **Problems:** For the implementation of the ‘best practice’ no special resources are required. As all the faculties of our institution whole heartedly welcome the practice, no problem is encountered in its implementation.

## 3. Alumni Bootcamps

- **Title of the Practice:** Alumni Boot Camps in **Amrita School of Business, Coimbatore**
- **Objectives of the Practice:** The main objective of these Alumni Boot Camps is to help our graduating students to learn about the way the industry works and its expectations from the graduating MBA students. These camps allow our students to interact intensely with their seniors actually working in the industry and to learn from them how to prepare for the placement process. We started these camps when we realized that our

students would be able to appreciate the importance of many other non-academic aspects of a corporate career such as developing expertise in soft skills, professionalism, importance of ethics and values, striving for excellence etc. when they discover the importance of these aspects from their own seniors. Students are somehow more receptive to learning when they are able to identify with the person teaching them. It is very easy for the students to identify with their own seniors than with faculty members and CIR experts. Thus these Alumni Boot Camps aim at supplementing the efforts made by the CIR and our faculty members to help prepare our graduating students for the placement process.

- The Context: The main constraint once again is the extremely tight calendar and time table that our students have because of the high number of courses that they have to study over the two year period. To find sufficient time for these Boot Camps was the major constraint. Another constraint that we have often faced in the past as already mentioned above is how to sensitize the students about the critical importance of soft skills for a management career. This problem is accentuated because over 60% of a typical batch is composed of engineering graduates who are very good with quantitative aspects of management and often tend to underestimate the importance of soft skills in career success. When the importance of these important aspects required in a corporate career is emphasized by their own seniors, it helps to break down their resistance. Some of the weaker students who actually need greater support because of their background (schooling in regional languages, small city/town/village origin, low self confidence etc.) tend to open up more with their seniors than with the CIR experts or faculty members. Thus, these Boot Camps also help these students to overcome their shyness and encourage them to take active steps in collaboration with their seniors. Many of the alumni who participate in these camps act as personal mentors to many of our students and help them to prepare for the placements as well as counsel them about their career decisions.
- Challenges: Some of the major challenges apart from finding the time within our calendar for these camps is coordinating with all the alumni regarding their travel to the campus on the days when these camps are scheduled. Since the alumni who participate in these camps do not charge any remuneration for conducting these camps, they do it for the sheer love and gratitude towards their alma mater. We have to contact the alumni and coordinate with them weeks in advance to help schedule their travel as well as to make arrangements for their accommodation at our campus. They in turn have to take permission from their employers to participate in these camps. But the good reputation that our school has built up with most of the employers and the good performance of our graduates in the industry helps them to get permission from their employers to help us with conducting these Boot Camps.
- The Practice: The main purpose of the Boot Camps is to expose the students to the expectations that the industry has from graduating MBA students. During these camps, the alumni conduct workshops with the students in groups where they share their own experiences of the journey that they have made, the main learnings that they have gained, do's and don'ts while preparing for the placements, various tips that can help to

prepare for specific sectors etc. They also conduct group discussions, mock interviews etc. They makes suggestions to the students about necessary areas in which they need to improve and also make suggestions about how to make those improvements. They share with our students various resources such as audio, video, and text materials that are of use for them. They also brief the students about their own companies and industries where they work so that the students can understand the expectations and requirements of those companies and sectors better. They help the students to prepare for the GDs and interviews by making them speak on a number of topics that are important and frequently used by the recruiters. They explain to the students about how to face the psychometric tests and how to prepare for the screening tests etc. They also give inputs on the soft skills side to supplement the efforts made by the CIR department. The constraints and limitations have already been explained above. We believe that alumni are a critical resource who are not very well utilized by many B-Schools. The Alumni Boot Camps that we have conducted in the last three years have been very effective and show that we should involve our alumni more and more in our programme. Other B-Schools can perhaps learn from our experience.

- Evidence of Success: These Boot Camps have been very successful as can be seen from the fact that we have been able to place almost 100% of our students in the last three years in good companies despite the adverse market circumstances. The students have also given extremely positive feedback about these camps and it has strengthened our relations with our alumni who feel happy to contribute to their school. This is evident by the overwhelming support that we have got from our alumni for this initiative taken by us.
- Problems Encountered and Resources Required: We have already explained the problems above. We do not need to spend any money as such to conduct these camps as the alumni bear their travel expenses to attend these camps. We only make arrangement for their boarding and lodging at our campus.

### **Best Practices**

Give details of any two best practices which have contributed to better academic and administrative functioning of the university.

#### **1. Soft Skill Training**

- Title of the Practice: Soft Skills Training provided by the *Corporate and Industrial Relations department, Amrita Vishwa Vidyapeetham*
- Objectives of the practice: The main objective of this best practice is to ensure that our graduates are equipped with good quality soft skills such as oral communication skills, ability to project a good and positive body language, preparing their CVs professionally, identify their personality profiles and work upon any weaknesses noticed by the experts from the CIR, developing expertise in group discussions and facing personal interviews etc.
- The Context: A significant portion of our students come from small towns and cities and from simple families. As a result of that many of them need

extra inputs in order to develop their soft skills. A well developed personality is a must for a successful career in the field of business management. This best practice started by us in the last few years helps to meet this need. The major challenge is to identify the specific problems faced by individual students and to cater to their specific soft skills development needs. But we have a team of soft skills training experts in the university CIR department who are able to provide this service very skillfully.

- The Practice: The soft skills training team of the CIR department assesses the unique soft skills development requirements of all the students with the help of various tools, techniques and their observations and faculty inputs. Soft skill training classes are conducted by the CIR department experts wherein the students are exposed to technical inputs concerning effective written and oral communication skills, presentation skills, effective body language, preparing CVs, participating in group discussions effectively, preparing for the placement interviews, industry expectations from MBA graduates, industry norms concerning expected behavior from business executives, working in teams and groups effectively etc. All the students are helped in understanding their personality profiles using various psychometric tests. These tests help the students to understand their unique strengths and weaknesses and to work upon leveraging their strengths and minimizing or eliminating their weaknesses. A series of mock group discussions and interviews are conducted under the guidance of the CIR experts as well as faculty support to give sufficient practice to the students. Each student gets the chance to participate in multiple mock GDs & Personal Interviews before facing the actual placements process. Feedback is provided to all the students at the end of these mock GD & PI sessions. These technical inputs by our expert team help the students to identify their particular weaknesses and to work upon them to make improvements. Students are also taught how to write effective CVs keeping in mind the requirements of the specific companies to which they are applying. They are also given tips about facing and doing well on the psychometric tests conducted by the recruiting companies during the placement process.
- The main constraint is the extremely tight calendar and time table that our students have because of the high number of courses that they have to study over the two year period. To find sufficient time for the Soft Skills training sessions has always been a major constraint. To overcome this constraint, from the academic session 2013-14 onwards, we have made Soft Skills as a Core Course for the second year MBA students. Another constraint that we have often faced in the past is how to sensitize the students about the critical importance of soft skills for a management career. This problem is accentuated because over 60% of a typical batch is composed of engineering graduates who are very good with quantitative aspects of management and often tend to underestimate the importance of soft skills in career success. Some of the students who actually need greater support because of their background (schooling in regional languages, small city/town/village origin, low self confidence etc.) tend to be closed during the soft skills sessions because of their inhibitions. To help these students to overcome their shyness and to encourage them to participate wholeheartedly is another major challenge. But the untiring

efforts made by our CIR team helps us to make significant contributions to the confidence and soft skills proficiency of these students. In fact we are reputed as a school that helps many ordinary students to become extraordinary as a result of our efforts. This is also in line with what our Chancellor, the great saint Mata Amritanandamayi Devi wants and expects from us.

- Evidence of Success: The main evidence of our success in these efforts is the fact that we have been able to achieve close to 100% placement in the last four years. We have seen many cases of students who were weak in the area of soft skills make significant improvements as a result of these inputs and make it to the corporate sector by meeting their requirements. We receive so many testimonials from our students about the difference that our programme made to their life and career. A significant part of the credit for these success stories goes to the Soft Skills development efforts made by the CIR team as well as the inputs provided by our faculty members.
- Problems Encountered and Resources Required: Already covered above as a part of the description of constraints faced.

## 2. Innovative Application of E-Learning Technology for Teaching & Other Academic Functions

1.	<b>Name of the Department / School</b>	<i>Amrita E-learning Labs</i>
2.	<b>Title of the practice</b>	Enhanced Access to Academic Experts through ICT-Enabled Technologies (A-VIEW System)
3.	<b>The context</b> that necessitated / triggered the initiation of the practice (100 – 120 words) The university has a complex structure, with five campuses, spread across three states. In order to make the best use of subject matter experts, making their knowledge available to all the constituent schools and departments of the university, the A-VIEW System has been effectively utilized, with great success. Additionally, inspired by our Chancellor, world renowned humanitarian, Sadguru Sri Mata Amritanandamayi, several highly qualified and experienced faculty, researchers, and industrial experts have freely volunteered their services towards teaching, project guidance, and other collaborative activities. As these experts are from all over the world, a system was needed to allow access to them, without them having to physically travel to the Amrita campuses on a frequent basis.	
4.	<b>Objectives</b> of the practice (50 – 60 words) To provide the students with access to the best in the field in terms of teaching, research, industrial experience, and community outreach. To provide the faculty with enhanced opportunities for collaboration in various academic aspects.	
5.	<b>The Practice</b> (250 – 300 words)	

	<p>In line with the trend of today’s classrooms becoming virtual, global and personalized. <b>AMRITA E-Learning Lab</b> has developed a unique E-learning system, A-VIEW, “Amrita Virtual Interactive E-Learning World”, which is cutting-edge video conferencing software, customized explicitly for Universities. A-VIEW is the preferred system for this national mission on education using ICT of the Government of India and is being currently deployed at all 600 universities and 30,000 colleges all over India free of cost. This system addresses the most pressing issue of higher education in India today, namely, the shortage of highly qualified teachers. A-VIEW brings classroom teaching, live from expert teachers and resource persons at reputed institutions as well as foreign universities to cater to the interested students at numerous locations all over India.</p>
6.	<p><b>Obstacles</b> faced if any, and strategies adopted to overcome them (150 – 200 words)</p> <p>Availability of newspapermen. Most often than not, contacting these people and getting assignments on time is challenging. But students are encouraged to be creative and if unable to establish contact they are encouraged to pursue their own stories and file them with the newspaper. Even if a reporting day turns out to be a disaster, it is still a lesson because it can happen to a reporter on the job. So students get a better understanding of occupational hazards that go with the profession. A day is too short a period to actually do things and hostel timings prove to be restrictive. Sometimes special permission for time extension is taken. At other times students are advised to make use of their holidays and personal time to complete work.</p>
	<p><b>Impact</b> of the practice: State how is it useful in making teaching useful and successful? (100 – 120 words)</p> <ul style="list-style-type: none"> <li>• Regular curricular courses have been taught using A-VIEW by a teacher on one of our campuses to students on our other campuses.</li> <li>• Supplemental value-added courses have been taught by highly qualified and experienced faculty and researchers from other prestigious institutions across the world (USA &amp; Europe).</li> <li>• Internal meetings of the university’s organizing committees have been held with participants in their respective campuses connected via A-VIEW.</li> <li>• Students have an immersive classroom experience, and express satisfaction at the opportunity to learn from highly accomplished teachers from Amrita Vishwa Vidyapeetham as well as from other world-renowned institutions.</li> </ul>
8.	<p><b>Resources required</b></p> <p>As the development of A-VIEW was funded by MHRD, under the NME-ICT mission, there is provision for set up of E-Learning Studios, with the associated hardware and software.</p>

# Report of Internal Quality Assurance Cell (IQAC)

## **Amrita University IQAC**

Amrita University Internal Quality Assurance Cell (IQAC) was constituted on 17<sup>th</sup> April, 2009 after the award of the 'A' grade in the first cycle of accreditation by NAAC in January, 2009. Considering the complexity of the university with 5 campuses, 14 schools, 150 programmes and more than 100 departments, a four tier IQAC structure was conceptualized at the university, campus, school, and department levels, to promote quality sustenance and enhancement, as also to bring about stakeholder participation and involvement at all levels. This structure also encapsulates the 'Quality Circle' concept, considering the fact that more than 150 faculty members are directly involved and interact frequently in their roles as coordinators at university, campus, school, and department levels.

At the University level, an IQAC was constituted with university senior administration, deans, principals, directors, administrative heads of campuses and schools as well as coordinators of various support services at the university level like Information and Communication Technology Services (ICTS), Website, In-House Academic ERP – Amrita University Management System (AUMS). The Amrita University IQAC Coordinators then took up the responsibility of working with various campuses and schools to constitute school level IQACs for each of the 14 schools and also organized a series of sensitization & awareness workshops about IQAC and its roles and responsibilities. Special emphasis was laid on integrating the efforts for quality improvement with alignment to the university's vision and mission, which in a nutshell in the words of the Chancellor is providing , "Education for life, not just education for a living". IQAC coordinators of each school were also given an orientation for this purpose. Campus level IQAC was constituted in addition to School IQACs at the healthcare campus because of the strong dependency of nursing, dental, pharmacy schools with hospital and shared services.

### **University IQAC Objectives**

- Generate good practices at the university level and ensure these practices are implemented across campuses, schools and departments.
- Plan, implement, and measure the outcome of academic and administrative performance of the university.
- Escalate all concerns and suggestions from various constituent schools of the university to university administration.
- Develop realistic and attainable quality benchmarks for each of the academic and administrative activities.
- Keep the institution abreast of and abuzz with quality sustenance activities through Workshops, Seminars, Demonstrations, Group Discussions, Panel Discussions, Symposia, etc.
- Facilitate exposure of the students and teachers to new frontiers of knowledge.
- Organize at least 1 or 2 quality improvement related events per year either at school or campus level.
- Document all information pertinent to generation of the Annual Quality Assurance Report (AQAR).

- Work with University Website coordinator to ensure consistency, accuracy, and currency of information
- Work with Registrar and other University Administrators to ensure that information provided in AQAR is consistent with information provided in other reports (e.g., UGC annual report).
- Assist towards re-accreditation (long-term).

### **School IQAC**

IQACs at all 14 schools and 4 stand-alone departments/centres were constituted as per NAAC guidelines and approved by the academic council of the university. Within each school, department level committees were also constituted for quality sustenance and enhancement. External members from the community were co-opted. Collection of data for Annual Quality Assurance Report (AQAR) commenced as an initial step.

The School IQAC serves as a powerful organ of the institution involving itself and working towards quality improvements in areas that span the entire gamut of activities of the school like academics, research, administration, and extension. School IQAC formulates and suggests strategies for continuous improvement at an operational level. Issues that need approval at appropriate levels like academic council or board of management are escalated to the University IQAC for deliberation and suitable action with university management, academic council, or board of management, as appropriate.

### **IQAC Meetings**

The university IQAC meets at least twice in a year in conjunction with the university academic council meeting. School IQACs meet very frequently deliberating issues and also escalating suggestions and developmental issues to the University IQAC coordinators, who visit each constituent school of AMRITA University and convene or attend School IQAC meetings on a regular basis. The University IQAC coordinators escalate the concerns and suggestions from School IQACs and make recommendations to the University IQAC, which are deliberated upon, and forwarded for approval to university academic council or board of management.

### **Website**

Amrita University IQAC website was created to disseminate roles, responsibilities and activities to all stakeholders of the university. The URL is [www.amrita.edu/iqac](http://www.amrita.edu/iqac)

The website highlights the Annual Quality Assurance Reports (AQAR) submitted to NAAC and also showcases various events organized, publications, and activities.

### **E-Mail**

To facilitate quick communication, two group e-mail ids [naac@amrita.edu](mailto:naac@amrita.edu) and [iqac@amrita.edu](mailto:iqac@amrita.edu) have been created. The first group e-mail id consists of IQAC coordinators as well as school heads and university administrators across all campuses. The second group e-mail id consists of university,

campus and school IQAC coordinators. Regular exchange of ideas, communication of instructions & information, and sharing of best practices happens through this medium.

### **IQAC Interventions towards Quality Sustenance and Enhancement**

An indicator of the success of IQAC activities post accreditation is the ranking in Review of Deemed Universities constituted by the Ministry of Human Resource Development (MHRD) of the Government of India. AMRITA was ranked in Category 'A' of this review popularly known in the media as the Tandon Committee report, which was conducted by a high power committee consisting of reputed academicians. Amrita Vishwa Vidyapeetham joins the ivy league of Indian universities along with the top institutions in India like Indian Institute of Science, Bangalore; Tata Institute of Fundamental Research (TIFR), Mumbai, etc. The health sciences campus has also secured NABH, NABL, and ISO 9000 certifications and accreditations.

Our IQAC plans regularly have a basis on continued enhancement and excellence with respect to the following:

10. Procedures to ensure smooth functioning of the university's day-to-day administration – with transparency, reliability, comprehensiveness, and clarity.
11. New degree programmes to meet current and future needs of society and industry.
12. Innovation to enhance the teaching-learning process – learning from national and international best practices.
13. Achieving faster growth and excellence in research.
14. Conduct of, and participation in, faculty development programmes.
15. Outreach to the scientific community, via technical and non-technical seminars/conferences/workshops.
16. Expansion of its infrastructure with respect to buildings, library facilities, computing facilities, laboratories, etc.
17. Links to recognized international and national academic institutions, industries, and Centres of excellence.
18. Participation in co-curricular, extra-curricular, and community service activities among students.

Specific IQAC interventions and recommendations with regard to various NAAC criteria to internalize the Quality Assurance (QA), Quality Sustenance (QS) and Quality Enhancement (QE) processes of the institutions are outlined below:

#### **Curricular Aspects**

- Initiation of several inter-disciplinary programmes like M.Tech in Cyber Security Systems & Networks, M.Tech in E-learning technologies and Master of Medicine in Emergency Medicine. Most of these programmes have been started for the first time in India and contribute immensely to national human resource development needs.

- Initiation of PG programmes in basic science and humanities in various schools and departments like M.Sc and M.A programmes in addition to well-established job-oriented programmes
- Initiation of sciences and humanities programmes like Integrated M.Sc Physics, Integrated M.Sc Mathematics, Integrated M.Sc Physics, Integrated MA (English) at Amrita School of Engineering, Coimbatore
- Initiation of new programmes as per suggestions of school IQACs like Post Basic B.Sc. Nursing programme at Amrita College of Nursing, Kochi; M.Sc. Programme in Medical Pharmacology, DM Pediatric Cardiology, DM Cardiac Anesthesia at Amrita School of Medicine, Kochi; M.Tech in Wireless Networks & Applications at Amrita School of Engineering, Amritapuri; Executive MBA at Bangalore campus for working IT professionals, Diploma course in Dental Mechanics at Amrita School of Dentistry, Kochi, M.Com programme at Amrita School of Arts & Sciences, Mysore campus, etc.
- Conversion of Annual System of M.Pharm programme into Semester System
- IQAC has pointed out to the university management the need for introducing PG programmes in a few disciplines like education. Corrective action is being initiated on this count.

### **Teaching-Learning and Evaluation**

- Change in regulations and grading norms suggested by School IQACs as per the best practices and benchmarks in various programmes subject to regulations stipulated by statutory authorities have been escalated for approval to academic council through University IQAC. For example for B.Tech programmes, internal evaluation percentage for theory courses was reduced from 60% to 50% as per new UGC guidelines
- Suggestion that answer scripts of all examinations in the University be retained under safe custody for a period of one year only, excepting those related to any judicial enquiry.
- Working with each school head to implement and document a formal system of student feedback and faculty course evaluation as well as ensure closure of the loop.
- IQAC works in tandem with the team developing and maintaining academic ERP system, AUMS (Amrita University Management System) to promote extensive ICT usage in facilitating teaching-learning process using the AUMS module, Academic Administration system which encompasses course registration, management & evaluation, grading, results and certificate generation across all campuses and programmes with central monitoring at the University headquarters. In many cases the IQAC coordinator and AUMS coordinator in many departments is the same person.
- Sharing of best practices for continuous evaluation like Weekly Quiz from IQAC of School of Engineering, Coimbatore to other schools
- Enforce uniform punishments to be awarded for malpractices committed during the Examinations
- Inclusion of 'Faculty name' in the Degree Certificates of the University, a suggestion from Campus IQAC of Health sciences campus at Kochi

- Inclusion name of the Department, under which the candidate has registered in the Ph.D. Degree Certificate, apart from ‘Title of the Thesis’ and the ‘name of the Faculty / Schools registered’, if it is a statutory requirement, a suggestion from Campus IQAC of Health sciences campus at Kochi
- IQAC has pointed out the lack of sufficient number of mid level (Associate Professors) faculty members in the university and suggestive corrective measures to improve cadre ratio. Corrective action is being initiated in recruitment efforts
- IQAC has suggested an ICT initiative towards blended learning, virtual classrooms, flip classrooms and MOOCs in addition to our strong and sustained programmes in e-learning, skill development, educational technologies and virtual labs

### **Research, Consultancy and Extension**

- Set up of Patenting cell to coordinate the Intellectual Property (IP) generation and safeguarding for all campuses and schools.
- Directive to all researchers in the university to use the affiliation, “Amrita Vishwa Vidyapeetham”, in addition to their department, centre, or school in all research publications.
- Adjunct faculty appointments of eminent academic leaders for research activities and Ph.D guidance
- Introduction of Research Methodology Course for the Ph.D. Scholars as per the new UGC regulations
- Initiation of Seed fund and research initiation grants for research promotion
- Initiate and promote collaborative activities between various centres of excellence & research with various schools of the university especially those which need expansion of research activities like collaboration between In-house educational technology development cell, Centre for Research in Advanced Educational Technologies (CREATE) at Amritapuri campus and Amrita School of Education, Mysore campus; collaboration between science departments at Coimbatore & Bangalore campuses and virtual labs centre of excellence at Amritapuri campus
- Initiate and support In-House research journals and working paper series.
- IQAC has pointed out the need for research activities and funded projects in various schools like arts & sciences, education, dental, nursing and pharmacy to be expanded. Consequently, action has been initiated by the university management. Research committees have been constituted in each of these schools to provide a fillip to research. Schools and Centres with extensive research activities are exploring methods to involve faculty from these schools.
- IQAC has pointed out the need to improve consultancy, Executive Development Programmes (EDP), Management Development Programmes (MDP) for industry especially
- IQAC has suggested establishment of chair professorships by industries to the university management. Directorate of Corporate & Industry Relations (CIR) has started exploring this.

- IQAC has suggested more activities and programmes in environmental studies and sustainability area leveraging existing environmental initiatives. Future plans in consideration by the university management include Centre of excellence in sustainability, M. Tech programme on sustainability, and carrying out a number of educational activities including the development of an Interpretation Centre on Western Ghats Biodiversity, teaching laboratories, etc.
- IQAC has pointed out the need to procure a plagiarism software for all campuses

### **Infrastructure and Learning Resources**

- Promote industry sponsored labs through directorate of corporate and industry relations. Some of the labs that have been developed include Amrita Cognizant Innovation Laboratory for Computer Vision & Image Processing , Microsoft sponsored embedded systems laboratory; Robert Bosch - Automotive Electronics Laboratory; Atmel and ARM Micro-controller Unit Labs etc at Amrita School of Engineering, Coimbatore
- IQAC has pointed out the need for expansion of on-campus faculty and staff quarters in Bangalore, Mysore and Amritapuri campuses. Corrective action has been initiated by the university management.
- IQAC has pointed out the need to expand e-resources and databases. Efforts are underway to add Science Direct and/or Scopus to library resources in all campuses.

### **Student Support and Progression**

- Initiation of Training programmes for various competitive examinations like GRE, CAT, GATE, and GMAT.
- Initiation of strong Co-curricular engagement of students through the conduct of national-level inter-university techfests and management fests. Some fests have been initiated through suggestions from School IQACs.
- Initiation of optional foreign language courses in Japanese, German, Spanish, etc., to improve employability.
- IQAC has pointed out the need to attract more foreign students leveraging the extensive tie-ups and MoUs that AMRITA has with 75 premier universities in USA, Europe, Japan and Australia.

### **Governance, Leadership and Management**

- Amrita Centre for International Programmes (ACIP) set up to support, coordinate, develop and manage all international initiatives like student, researcher and faculty exchange, dual degrees, remote teaching, joint academic programmes, co-guidance of Ph.D students and research scholars, high-end research collaboration and memoranda of understanding with premier universities across the globe
- Even though alumni associations in each school exist, IQAC has pointed out lack of extensive and comprehensive networking and engagement with Amrita alumni and the need to involve them in various activities of the university

### IQAC Events and Outreach

- **NAAC Director is Guest of Honor for the Campus Day of Amritapuri campus of Amrita Vishwa Vidyapeetham:** Dr. H.A. Ranganath, then Director, National Assessment and Accreditation Council (NAAC) was the guest of honor for the Campus Day of the Amritapuri campus of Amrita Vishwa Vidyapeetham on April 30, 2013. Sampujya Swami Amritaswarupananda Puri, Vice-Chairman, Mata Amritanandamayi Math and President, Board of Management, Amrita University presided over the event, and delivered the benedictory address. Dr. Ranganath released the Campus Magazine, *Amritakshari* and newsletter, *Samved* and presented excellence and appreciation awards to faculty, researchers and students with outstanding achievements during the colorful ceremony. In his address, Dr. Ranganath said, "*Amrita provides a holistic education to students. With divine blessings, I am sure that the university will bring laurels to the country and become an important model in higher education. Across the global level, we need to have Indian institutions in the academic ranking lists. Amrita has all the ingredients and the critical mass to move forward and aspire to a rank in the global lists*". Expressing happiness at Amrita's initiatives towards bringing quality in higher education and research, he complimented Amrita, "*If all universities were like Amrita, the role of regulatory agencies like NAAC, UGC and MHRD would diminish significantly*". Amrita University had secured 'A' grade from NAAC for all its campuses and programmes in 2009. Padmashri Dr. Ashok Jhunjunwala, Professor, IIT Madras and a member of the Scientific Advisory Council to the Prime Minister of India was the Chief Guest for the Campus Day celebrations.
- Dr. Sriram Devanathan, Amrita University IQAC Coordinator, has been active in representing the university at various prestigious academic conferences and spreading awareness on quality in higher education, in numerous ways. A sample of the same is given below:
  - He represented the university at the EDU's 3<sup>rd</sup> Annual Vice-Chancellors Retreat at Gurgaon (UP), 7<sup>th</sup> – 9<sup>th</sup> Sept 2013, organized on the theme, "Benchmarking the best – Rankings, Accreditation & Beyond". During the retreat, he was asked to create and lead a group discussion, which he successfully did, based on the theme, "Realistic Accreditation – not window dressing, but change agent".
  - He was a featured, invited speaker at the conference, "Data Analytics in Higher Education & Training", which was the 7th conference as part of Integrating Australia with Asia conference series, organized by GLOBAL MINDSET, in Australia, on 29<sup>th</sup> October 2013. His talk was titled, "Higher Education in India: Current Views & Projections".
  - Along with Dr. Venkat Rangan (Vice-Chancellor of Amrita University), he represented the university at the "Economic Times Master Class and Workshop", held on the theme of "Global Rankings & its Implications", organized by ICAA, in associating with QS World Rankings, on 15<sup>th</sup> Nov 2013.
  - He delivered a plenary lecture on, "Challenges and Solutions in the Implementation of Learning Management Systems in India", at the

International Conference on Technology Enhanced Education, held on 4<sup>th</sup> Jan 2012 at the Amrita University campus in Amritapuri.

- Prof. Prashant R. Nair, Assistant Coordinator, Amrita University IQAC was a resource person for the UGC sponsored National Summit on Higher Education for the 21st Century: Changing Realities and Challenges at PSGR Krishnammal College for Women, Coimbatore on 25 February, 2013. He gave a presentation on “Applications of ICT in Higher Education: and also chaired a session on the same theme. In his presentation on ICT for education, Prashant showcased AMRITA's usage and wide deployment of in-house ICT-based tools like A-VIEW, AUMS and telemedicine, which have contributed in a large measure towards organizational innovation and quality sustenance.
- Prof. Prashant R.Nair, Assistant Coordinator - Amrita IQAC, has been elected as the Vice-Chair of IEEE Education Society in India. The IEEE Education Society (EdSoc) is a society of the IEEE, focused on the theory and practice of [education](#) and [educational technology](#) needed to effective delivery and quality improvement.
- Prof. Prashant R.Nair, Assistant Coordinator, Amrita IQAC was a resource person for a NAAC sponsored National seminar on Quality Enhancement in Higher Education through Best Practices at Sri Narayana College, Coimbatore on 9 January, 2013. He gave a talk on, “Best Practices in Curriculum, Teaching and Learning”, for the seminar.
- A delegation from Amrita Vishwa Vidyapeetham participated in the 1st World Summit of Accreditation (WOSA) 2012 organized by the National Board of Accreditation (NBA) at Hotel Ashok in New Delhi, from 25th to 27th March, 2012. The summit was inaugurated by Shri Kapil Sibal, Honorable Union Minister for Human Resource Development (MHRD) of Government of India. The Amrita delegation consisted of University IQAC Coordinators, Dr. Sriram Devanathan and Prof. Prashant R. Nair and the IQAC Coordinator of Amrita School of Engineering, Coimbatore, Prof. Sanjivi Arul. The summit focused on several international accreditation frameworks and systems like the Washington Accord, ABET, EUR-ACE, AASCB, and AMBA.
- Prof. Prashant R. Nair, Assistant Coordinator, Amrita IQAC, was one of the resource persons for a NAAC-sponsored National Level seminar on TQM in Higher Educational Institutions – Challenges and Perspectives at RVS College of Arts and Science (Autonomous), Sulur, Coimbatore, on 27th January, 2012. He gave a talk on Strategies for Private Universities/Institutions towards TQM – A case study.
- Dr. Sriram Devanathan, Professor and Coordinator, Amrita IQAC, delivered expert lectures as part of an ongoing lecture series conducted on a weekly basis using the platform of AVIEW (Amrita Virtual Interactive E-learning World). AVIEW is a state-of-the-art framework that provides a rich interactive social environment for E-Learning. It provides a great opportunity to a teacher to teach in a live interactive mode to various geographical locations across India. This has been developed by Amrita University under the sponsorship and direction of NME-ICT (National Mission on Education through Information & Communication Technology). The talk on, “AVIEW Quality Initiative”, was held on March 07, 2012, and another talk, “Six Sigma for Education Technology”, on

December 14, 2011 on. The talks were webcast live to numerous colleges across the country, and each lecture concluded with an interactive session with the participating institutions for questions.

- World Quality Day Celebrations: World Quality Day was introduced by the United Nations in 1990 to increase worldwide awareness of the important contribution that quality makes towards a nation's and an organization's growth and prosperity. On 10 November, 2009, AMRITA IQAC organized Essay Writing Competition on the topic, "What quality means to me"; for various sections of the campus community, i.e., Students (English), Faculty (English), Academic Administrative Staff (English) and Estate Office Staff (Malayalam & Tamil). On this occasion, Dr. Sudhakar Achath, Professor of Operations Management at Amrita School of Business, Coimbatore, who had been recently conferred the 17th Dewang Mehta Business Award for Best teacher in OM, was felicitated by the University. AMRITA Registrar, Dr. S. Krishnamoorthy presided over the event. AMRITA IQAC coordinator, Dr. Sriram Devanathan delivered the theme address.
- National Conference on Quality improvement concepts and their implementations in Higher Educational Institutions: The Amrita University IQAC and the department of Mathematics of Amrita School of Engineering, Coimbatore, organized the National Conference on Quality Improvement Concepts and their implementations in Higher Educational Institutions at Amrita University, Coimbatore campus on the 16th and 17th of December, 2009. Four technical sessions saw the presentation of over twenty-five research papers from delegates representing various educational institutions from Tamil Nadu, Andhra Pradesh, Karnataka, and Kerala. These papers covered different aspects of the following topics:
  - Total Quality Management in Higher Education
  - Six Sigma Quality in Higher Education
  - Statistical Quality and Quality Improvement in Higher Education.

The Amrita experience in securing the NAAC accreditation of 'A' grade for all its campuses and programmes was also showcased. The conference was inaugurated by Prof. Ashoka Chandra, Former Special Secretary, Technical Education, Ministry of Human Resource Development (MHRD), Government of India and Principal Advisor, International Management Institute, New Delhi on 16th December, 2009. Dr. V. Raju, Dean-Engineering, State University of New York at Farmingdale, USA and a past Commissioner of the Technology Accreditation Commission of Accreditation Board for Engineering and Technology (ABET), USA, was the guest of honor for the inaugural. Dr. M.P. Chandrasekharan, Dean-Engineering, Amrita and Dr. S. Krishnamoorthy, Registrar, Amrita also addressed the gathering. The speakers included distinguished academicians and quality experts from prestigious organizations including, ISI (Coimbatore), PSG Group of Institutions, Acharya Nagarjuna Institute (Guntur), Bharatiyar University (Coimbatore), and IBM India Pvt. Ltd.

The conference was sponsored by Ministry of Statistics and Programme Implementation of Government of India, DRDO, CSIR, and BARC.

### **IQAC Documentation System**

The role of IQAC as a historian and custodian of all documentation of the university has been significantly stressed by NAAC. Amrita University IQAC has evolved a good system in this regard, which was mandated for all constituent schools by the university academic council in 2011. Each campus, school and department has to maintain a specified list of files and folders. Periodic documentation audits of these are happening on a regular basis by both internal and external persons.

The office of registrar and University IQAC coordinators are responsible for maintenance of documents and files at university level like minutes of meetings of board of management/academic council/university IQAC/Committee for UG Programmes (CUGP)/Committee for PG Programmes (CPGP)/Board of Studies/Patenting Cell/MoUs for International Programmes/Register of Graduates/Policy documents etc

At the school and department level, a list has been mandated which covers all academic, administrative, research and extension activities. School IQAC is responsible for maintenance of the documents at both schools and department level in their respective schools. While the actual detailed format in use is available upon request, a sample list documentation areas is as follows, just to indicate the comprehensiveness of the effort: curricular transactions, term planning and activities, course registrations, course management (including evaluations), admissions & fees, student activities & welfare, staff recruitment/development/welfare, program management (department level), research activities & output, events conducted by university schools & departments, etc.

### **IQAC Publications**

- Hardik B. Vachharajani, IQAC Coordinator, Department of Management, Amritapuri campus - QUALITY AND INNOVATION IN HIGHER EDUCATION: Hardik B. Vachhrajani and Bhadrayu V.Vachhrajani, Published By: Shree Niwas Publications, Jaipur, India, 2011, ISBN 978-93-5032-010-5
- J. Ravichandran, IQAC Member, Amrita School of Engineering, Coimbatore - QUALITY IMPROVEMENT CONCEPTS AND THEIR IMPLEMENTATION IN HIGHER EDUCATIONAL INSTITUTIONS: J. Ravichandran , Published By: Shri Garuda Publications, Coimbatore, India, 2009, ISBN 978-81-907870-4-8

## DECLARATION BY THE HEAD OF THE INSTITUTION

I certify that that the data included in this Re-Accreditation Report (RAR) are true to the best of my knowledge.

This RAR is prepared by the institution after internal discussions and no part thereof has been outsourced.

I am aware that the Peer team will validate the information provided in this RAR during the peer team visit.



Dr. P. Venkat Rangan  
Vice Chancellor

**Signature of the Head of the institution with seal:**

**Place:** Coimbatore, Tamil Nadu

**Date:** 16-December-2013

