



**AMRITA**  
VISHWA VIDYAPEETHAM

School of  
Engineering

(AMRITAPURI, BANGALORE, COIMBATORE, CHENNAI)

**B.Tech. in AEROSPACE ENGINEERING  
(BTC-AES)**

**CURRICULUM 2019**

**SEMESTER I**

<b>Cat.</b>	<b>Code</b>	<b>Title</b>	<b>L T P</b>	<b>Credit</b>
<b>HUM</b>	<b>19ENG111</b>	<b>Technical Communication</b>	<b>2 0 3</b>	<b>3</b>
<b>SCI</b>	<b>19MAT101</b>	<b>Single Variable Calculus</b>	<b>1 0 0</b>	<b>1</b>
<b>SCI</b>	<b>19MAT102</b>	<b>Matrix Algebra</b>	<b>2 0 0</b>	<b>2</b>
<b>ENGG</b>	<b>19CSE100</b>	<b>Problem Solving and Algorithmic Thinking</b>	<b>2 1 3</b>	<b>4</b>
<b>SCI</b>	<b>19PHY102/ 19CHY101</b>	<b>Engineering Physics - B /Engineering Chemistry - A</b>	<b>2 1 0</b>	<b>3</b>
<b>SCI</b>	<b>19PHY182/ 19CHY181</b>	<b>Engineering Physics Lab - B / Engineering Chemistry Lab – A</b>	<b>0 0 3</b>	<b>1</b>
<b>ENGG</b>	<b>19EEE100</b>	<b>Basic Electrical and Electronics Engineering</b>	<b>3 0 0</b>	<b>3</b>
<b>ENGG</b>	<b>19AEE101</b>	<b>Introduction to Aerospace Engineering</b>	<b>0 0 3</b>	<b>1</b>
<b>ENGG</b>	<b>19MEE100</b>	<b>Engineering Graphics – CAD</b>	<b>2 0 3</b>	<b>3</b>
<b>HUM</b>	<b>19CUL101</b>	<b>Cultural Education – I</b>	<b>2 0 0</b>	<b>2</b>
		<b>TOTAL</b>		<b>23</b>

**SEMESTER II**

<b>Cat.</b>	<b>Code</b>	<b>Title</b>	<b>L T P</b>	<b>Credit</b>
<b>SCI</b>	<b>19MAT111</b>	<b>Multivariable Calculus</b>	<b>2 0 0</b>	<b>2</b>
<b>SCI</b>	<b>19MAT106</b>	<b>Ordinary Differential Equations</b>	<b>2 0 0</b>	<b>2</b>
<b>SCI</b>	<b>19PHY102/ 19CHY101</b>	<b>Engineering Physics - B /Engineering Chemistry - A</b>	<b>2 1 0</b>	<b>3</b>
<b>SCI</b>	<b>19PHY182/ 19CHY181</b>	<b>Engineering Physics Lab - B / Engineering Chemistry Lab - A</b>	<b>0 0 3</b>	<b>1</b>
<b>ENGG</b>	<b>19CSE102</b>	<b>Computer Programming</b>	<b>3 0 3</b>	<b>4</b>
<b>ENGG</b>	<b>19MEE111</b>	<b>Engineering Mechanics</b>	<b>3 1 0</b>	<b>4</b>
<b>ENGG</b>	<b>19MEE181</b>	<b>Manufacturing Practice</b>	<b>0 0 3</b>	<b>1</b>
<b>ENGG</b>	<b>19AEE111</b>	<b>Introduction to Aerospace Technology</b>	<b>3 0 0</b>	<b>3</b>
<b>ENGG</b>	<b>19EEE181</b>	<b>Basic Electrical and Electronics Engineering Lab</b>	<b>0 0 3</b>	<b>1</b>
<b>HUM</b>	<b>19CUL111</b>	<b>Cultural Education - II</b>	<b>2 0 0</b>	<b>2</b>
		<b>TOTAL</b>		<b>23</b>

**SEMESTER III**

Cat	Code	Title	L T P	Cr
HUM		Free Elective I**	2 0 0	2
HUM	19AVP201	Amrita Values Program I	1 0 0	1
SCI	19MAT206	Laplace Transforms	2 0 0	2
SCI	19MAT203	Partial Differential Equations	1 0 0	1
ENGG	19AEE201	Mechanics of Fluids	3 1 0	4
ENGG	19AEE203	Mechanics of Materials	2 1 0	3
ENGG	19AEE204	Materials for Aviation and Space	3 0 0	3
ENGG	19AEE202	Introduction to Thermodynamics	2 1 0	3
ENGG	19AEE281	Measurement and Instrumentation Lab.®	0 0 3	1
ENGG		Professional Elective I*	3 0 0	3
HUM	19MNG300	Disaster Management		P/F
		<b>Total</b>	<b>25</b>	<b>23</b>

**SEMESTER IV**

Cat	Code	Title	L T P	Cr
HUM		Free Elective II**	2 0 0	2
HUM	19AVP211	Amrita Values Program II	1 0 0	1
SCI	19MAT211	Numerical Computing	2 0 2	3
ENGG	19AEE211	Aerodynamics I	3 0 0	3
ENGG	19AEE212	Compressible Fluid Flow	2 1 0	3
ENGG	19AEE213	Aerospace Structures I	3 0 0	3
ENGG	19AEE214	Introduction to Control Theory	2 1 0	3
ENGG	19AEE282	Mechanics of Fluids Lab.	0 0 3	1
ENGG	19AEE283	Materials Testing Lab.®	0 0 3	1
HUM	19SSK211	Soft Skills I	1 0 2	2
HUM	19ENV300	Environmental Science		P/F
		<b>Total</b>	<b>28</b>	<b>22</b>

**SEMESTER V**

<b>Cat</b>	<b>Code</b>	<b>Title</b>	<b>L T P</b>	<b>Cr</b>
<b>SCI</b>	<b>19MAT112</b>	<b>Linear Algebra</b>	<b>2 1 0</b>	<b>3</b>
<b>ENGG</b>	<b>19AEE301</b>	<b>Aerodynamics II</b>	<b>2 1 0</b>	<b>3</b>
<b>ENGG</b>	<b>19AEE302</b>	<b>Aerospace Propulsion</b>	<b>2 1 0</b>	<b>3</b>
<b>ENGG</b>	<b>19AEE303</b>	<b>Aerospace Structures II</b>	<b>3 0 0</b>	<b>3</b>
<b>ENGG</b>	<b>19AEE304</b>	<b>Avionics</b>	<b>3 0 0</b>	<b>3</b>
<b>ENGG</b>		<b>Professional Elective II*</b>	<b>3 0 0</b>	<b>3</b>
<b>ENGG</b>	<b>19AEE381</b>	<b>Aero-structures Lab.@</b>	<b>0 0 3</b>	<b>1</b>
<b>ENGG</b>	<b>19AEE382</b>	<b>Avionics Lab.@</b>	<b>0 0 3</b>	<b>1</b>
<b>HUM</b>	<b>19SSK301</b>	<b>Soft Skills II</b>	<b>1 0 2</b>	<b>2</b>
<b>ENGG</b>	<b>19LIV390</b>	<b>[Live-in –Labs]***</b>		<b>[3]</b>
<b>HUM</b>	<b>19LAW300</b>	<b>Indian Constitution</b>		<b>P/F</b>
		<b>Total</b>	<b>27</b>	<b>22 +[3]</b>

**SEMESTER VI**

<b>Cat</b>	<b>Code</b>	<b>Title</b>	<b>L T P</b>	<b>Cr</b>
<b>ENGG</b>	<b>19AEE311</b>	<b>Finite Element Methods for Aerospace</b>	<b>2 1 0</b>	<b>3</b>
<b>ENGG</b>	<b>19AEE312</b>	<b>Flight Mechanics</b>	<b>2 1 0</b>	<b>3</b>
<b>ENGG</b>		<b>Professional Elective III*</b>	<b>3 0 0</b>	<b>3</b>
<b>ENGG</b>		<b>Professional Elective IV*</b>	<b>3 0 0</b>	<b>3</b>
<b>ENGG</b>	<b>19AEE383</b>	<b>Propulsion Lab.@</b>	<b>0 0 3</b>	<b>1</b>
<b>ENGG</b>	<b>19AEE384</b>	<b>Low-speed Aerodynamics Lab.@</b>	<b>0 0 3</b>	<b>1</b>
<b>ENGG</b>	<b>19AEE385</b>	<b>Innovations Lab.</b>	<b>0 0 3</b>	<b>1</b>
<b>HUM</b>	<b>19SSK311</b>	<b>Soft Skills III</b>	<b>1 0 3</b>	<b>2</b>
<b>ENGG</b>	<b>19LIV490</b>	<b>[Live-in –Labs]***</b>		<b>[3]</b>
		<b>Total</b>	<b>25</b>	<b>17+[3]</b>

## SEMESTER VII

Cat	Code	Title	L T P	Cr
ENGG	19AEE401	Computational Fluid Dynamics for Aerospace	2 1 0	3
ENGG	19AEE402	Aero Design	2 2 3	5
ENGG	19AEE403	Flight Dynamics & Control	3 0 0	3
ENGG		Professional Elective V*	3 0 0	3
ENGG		Professional Elective VI*	3 0 0	3
ENGG	19AEE481	Flight testing lab.	0 0 3	1
PRJ	19AEE495	Project Phase 1	0 0 6	2
		<b>Total</b>	<b>28</b>	<b>20</b>

## SEMESTER VIII

Cat	Code	Title	L T P	Cr
ENGG		Professional Elective VII*	3 0 0	3
ENGG		Professional Elective VIII*	3 0 0	3
PRJ	19AEE499	Project Phase II	0 0 30	10
		<b>Total</b>	<b>36</b>	<b>16</b>

		<b>Total Credits</b>		<b>166</b>
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*@Hands-on' Project-based Lab.*

**\*Professional Elective - Electives categorised under Engineering, Science, Mathematics, Live-in-Labs, and NPTEL Courses. Student can opt for such electives across departments/campuses. Students with CGPA of 7.0 and above can opt for a maximum of 2 NPTEL courses with the credits not exceeding 8.**

**\*\* Free Electives - This will include courses offered by Faculty of Humanities and Social Sciences/ Faculty Arts, Commerce and Media / Faculty of Management/Amrita Darshanam -(International Centre for Spiritual Studies).**

**\*\*\* Live-in-Labs - Students undertaking and registering for a Live-in-Labs project, can be exempted from registering for an Elective course in the higher semester.**

<b>PROFESSIONAL ELECTIVES</b>				
<b>PROFESSIONAL ELECTIVE II</b>				
<b>Cat</b>	<b>Code</b>	<b>Title</b>	<b>L T P</b>	<b>Cr</b>
<b>ENGG</b>	<b>19AEE331</b>	<b>Fundamentals Heat Transfer</b>	<b>3 0 0</b>	<b>3</b>
<b>ENGG</b>	<b>19AEE332</b>	<b>Manufacturing Processes</b>	<b>3 0 0</b>	<b>3</b>
<b>ENGG</b>	<b>19AEE333</b>	<b>Vibration Analysis</b>	<b>3 0 0</b>	<b>3</b>
<b>ENGG</b>	<b>19AEE334</b>	<b>Computational Methods for Engineers</b>	<b>3 0 0</b>	<b>3</b>

<b>PROFESSIONAL ELECTIVE IV</b>				
<b>Cat</b>	<b>Code</b>	<b>Title</b>	<b>L T P</b>	<b>Cr</b>
<b>ENGG</b>	<b>19AEE341</b>	<b>Experimental Aerodynamics</b>	<b>3 0 0</b>	<b>3</b>
<b>ENGG</b>	<b>19AEE342</b>	<b>Composite Materials and Mechanics</b>	<b>3 0 0</b>	<b>3</b>
<b>ENGG</b>	<b>19AEE343</b>	<b>Advanced Avionics</b>	<b>3 0 0</b>	<b>3</b>
<b>ENGG</b>	<b>19AEE344</b>	<b>Hypersonic Flow Theory</b>	<b>3 0 0</b>	<b>3</b>
<b>ENGG</b>	<b>19AEE345</b>	<b>Aero-Elasticity</b>	<b>3 0 0</b>	<b>3</b>

<b>PROFESSIONAL ELECTIVE V</b>				
<b>Cat</b>	<b>Code</b>	<b>Title</b>	<b>L T P</b>	<b>Cr</b>
<b>ENGG</b>	<b>19AEE431</b>	<b>Air Breathing Engines</b>	<b>3 0 0</b>	<b>3</b>
<b>ENGG</b>	<b>19AEE432</b>	<b>Engineering Fracture Mechanics</b>	<b>3 0 0</b>	<b>3</b>
<b>ENGG</b>	<b>19AEE433</b>	<b>Helicopter Theory</b>	<b>3 0 0</b>	<b>3</b>

<b>PROFESSIONAL ELECTIVE VI</b>				
<b>Cat</b>	<b>Code</b>	<b>Title</b>	<b>L T P</b>	<b>Cr</b>
<b>ENGG</b>	<b>19AEE441</b>	<b>Rocket and Spacecraft Propulsion</b>	<b>3 0 0</b>	<b>3</b>
<b>ENGG</b>	<b>19AEE442</b>	<b>Advanced Composite Structures</b>	<b>3 0 0</b>	<b>3</b>
<b>ENGG</b>	<b>19AEE443</b>	<b>State Space Techniques</b>	<b>3 0 0</b>	<b>3</b>

**PROFESSIONAL ELECTIVE VII**

Cat	Code	Title	L T P	Cr
ENGG	19AEE451	Turbulent Flows	3 0 0	3
ENGG	19AEE452	Space Flight Mechanics	3 0 0	3
ENGG	19AEE453	Multidisciplinary Design Optimization	3 0 0	3

**PROFESSIONAL ELECTIVE VIII**

Cat	Code	Title	L T P	Cr
ENGG	19AEE461	Advanced Computational Fluid Dynamics	3 0 0	3
ENGG	19AEE462	Surface Engineering, Coating and Joining Technologies	3 0 0	3
ENGG	19AEE463	Principles of Airport Management	3 0 0	3

**PROFESSIONAL ELECTIVES UNDER SCIENCE STREAM**

<b>CHEMISTRY</b>				
Cat.	Code	Title	L T P	Credit
SCI	19CHY243	Computational Chemistry and Molecular Modelling	3 0 0	3
SCI	19CHY236	Electrochemical Energy Systems and Processes	3 0 0	3
SCI	19CHY240	Fuels and Combustion	3 0 0	3
SCI	19CHY232	Green Chemistry and Technology	3 0 0	3
SCI	19CHY239	Instrumental Methods of Analysis	3 0 0	3
SCI	19CHY241	Batteries and Fuel Cells	3 0 0	3
SCI	19CHY242	Corrosion Science	3 0 0	3
<b>PHYSICS</b>				
SCI	19PHY340	Advanced Classical Dynamics	3 0 0	3
SCI	19PHY342	Electrical Engineering Materials	3 0 0	3
SCI	19PHY331	Physics of Lasers and Applications	3 0 0	3
SCI	19PHY341	Concepts of Nanophysics and Nanotechnology	3 0 0	3
SCI	19PHY343	Physics of Semiconductor Devices	3 0 0	3
SCI	19PHY339	Astrophysics	3 0 0	3

Mathematics				
SCI	19MAT341	Statistical Inference	3 0 0	3
SCI	19MAT342	Introduction to Game Theory	3 0 0	3
SCI	19MAT343	Numerical Methods and Optimization	3 0 0	3

### FREE ELECTIVES

FREE ELECTIVES OFFERED UNDER MANAGEMENT STREAM				
Cat.	Code	Title	L T P	Credit
HUM	19MNG331	Financial Management	3 0 0	3
HUM	19MNG332	Supply Chain Management	3 0 0	3
HUM	19MNG333	Marketing Management	3 0 0	3
HUM	19MNG334	Project Management	3 0 0	3
HUM	19MNG335	Enterprise Management	3 0 0	3
HUM	19MNG338	Operations Research	3 0 0	3
HUM	19MEE401	Industrial Engineering	3 0 0	3
HUM	19MEE346	Managerial Statistics	3 0 0	3
HUM	19MEE347	Total Quality Management	3 0 0	3
HUM	19MEE342	Lean Manufacturing	3 0 0	3
HUM	19CSE358	Software Project Management	3 0 0	3
HUM	19CSE359	Financial Engineering	3 0 0	3
HUM	19CSE360	Engineering Economic Analysis	3 0 0	3
HUM	19MNG331	Financial Management	3 0 0	3
HUM	19CSE362	Information Systems	3 0 0	3

FREE ELECTIVES OFFERED UNDER HUMANITIES / SOCIAL SCIENCE STREAMS				
Cat.	Code	Title	L T P	Credit
HUM	19CUL230	Achieving Excellence in Life - An Indian Perspective	2 0 0	2
HUM	19CUL231	Excellence in Daily Life	2 0 0	2
HUM	19CUL232	Exploring Science and Technology in Ancient India	2 0 0	2
HUM	19CUL233	Yoga Psychology	2 0 0	2
HUM	19ENG230	Business Communication	1 0 3	2
HUM	19ENG231	Indian Thought through English	2 0 0	2



HUM	19ENG232	Insights into Life through English Literature	2 0 0	2
HUM	19ENG233	Technical Communication	2 0 0	2
HUM	19ENG234	Indian Short Stories in English	2 0 0	2
HUM	19FRE230	Proficiency in French Language (Lower)	2 0 0	2
HUM	19FRE231	Proficiency in French Language (Higher)	2 0 0	2
HUM	19GER230	German for Beginners I	2 0 0	2
HUM	19GER231	German for Beginners II	2 0 0	2
HUM	19GER232	Proficiency in German Language (Lower)	2 0 0	2
HUM	19GER233	Proficiency in German Language (Higher)	2 0 0	2
HUM	19HIN101	Hindi I	2 0 0	2
HUM	19HIN111	Hindi II	2 0 0	2
HUM	19HUM230	Emotional Intelligence	2 0 0	2
HUM	19HUM231	Glimpses into the Indian Mind - the Growth of Modern India	2 0 0	2
HUM	19HUM232	Glimpses of Eternal India	2 0 0	2
HUM	19HUM233	Glimpses of Indian Economy and Polity	2 0 0	2
HUM	19HUM234	Health and Lifestyle	2 0 0	2
HUM	19HUM235	Indian Classics for the Twenty-first Century	2 0 0	2
HUM	19HUM236	Introduction to India Studies	2 0 0	2
HUM	19HUM237	Introduction to Sanskrit Language and Literature	2 0 0	2
HUM	19HUM238	National Service Scheme	2 0 0	2
HUM	19HUM239	Psychology for Effective Living	2 0 0	2
HUM	19HUM240	Psychology for Engineers	2 0 0	2
HUM	19HUM241	Science and Society - An Indian Perspective	2 0 0	2
HUM	19HUM242	The Message of Bhagwad Gita	2 0 0	2
HUM	19HUM243	The Message of the Upanishads	2 0 0	2
HUM	19HUM244	Understanding Science of Food and Nutrition	2 0 0	2
HUM	19JAP230	Proficiency in Japanese Language (Lower)	2 0 0	2
HUM	19JAP2313	Proficiency in Japanese Language (Higher)	2 0 0	2
HUM	19KAN101	Kannada I	2 0 0	2
HUM	19KAN111	Kannada II	2 0 0	2
HUM	19MAL101	Malayalam I	2 0 0	2
HUM	19MAL111	Malayalam II	2 0 0	2
HUM	19SAN101	Sanskrit I	2 0 0	2
HUM	19SAN111	Sanskrit II	2 0 0	2
HUM	19SWK230	Corporate Social Responsibility	2 0 0	2
HUM	19SWK231	Workplace Mental Health	2 0 0	2
HUM	19TAM101	Tamil I	2 0 0	2
HUM	19TAM111	Tamil II	2 0 0	2