

**M.Tech. in Defence Technology**

**Syllabi for M.Tech in Defence Technology**

**Syllabi**

T : Tutorial; L : Lecture; P : Practical

**Semester - 1**

S. No.	Course Code	Course of study and scheme of examination	M.Tech			Branch Defence Technology
			Periods/Week			Total Credits
		Compulsory Courses	L	T	P	
1.	DT-01-01	Systems and warfare Platforms	4	-	-	4
2.	DT-01-02	Warfare Simulations & Strategies	4	-	-	4
3.	DT-01-03	Advanced Engineering Mathematics	4	-	-	4
4.	DT-01-L01	Systems and Platforms Lab	-	-	2	2
5.	DT-01-L02	Warfare Simulations & Strategies Lab	-	-	2	2
		<b>Elective Courses</b>				
6.		Elective 1	3	-	-	3
7.		Elective 2	3	-	-	3
8.		Seminar	-	-	1	1
		Total credits				23

**Semester -1 Elective Courses**

- Students are expected to select the Elective-I course of their choice, provided that at least a group of 7 students should opt for the similar elective course.

S. No.	Course Code	Course of study and scheme of examination	M.Tech Semester-1			
			Periods/Week			Total Credits
		Elective 1	L	T	P	
1.	DT-EL1-01	Rockets & Missiles Fundamentals	3	-	-	3
2.	DT-EL1-02	Advanced Thermal Engineering	3	-	-	3

3.	DT-EL1-03	Numerical methods for science & engineering	3	-	-	3
4.	DT-EL1-04	Communication Technology	3	-	-	3
5.	DT-EL1-05	Advanced Mechanical Engineering	3	-	-	3

S. No.	Course Code	Course of study and scheme of examination	M.Tech Semester-1			
			Elective 2			
			Periods/Week			Total Credits
L	T	P				
1.	DT-EL2-01	Autonomy and Navigation Technology	3	-	-	3
2.	DT-EL2-02	Optimization theory & applications	3	-	-	3
3.	DT-EL2-03	Military Electronics System Engineering	3	-	-	3
4.	DT-EL2-04	System Engineering & Analysis	3	-	-	3

## Semester - 2: Main Stream Defence Technology with following specializations

### 1. Aerospace Technology

S. No.	Course Code	Course of study and scheme of examination	M.Tech Semester-2			Branch Defence Technology
			Compulsory Courses			Total Credits
			Aerospace Technology			
			L	T	P	
1.	DT-AT-01	Aerospace System Configuration, Design & Simulation	4	-	-	4
2.	DT-AT-02	Guidance & control	4	-	-	4
3.	DT-AT-03	Aerospace Propulsion	4	-	-	4
4.	DT-AT-L01	Aerospace System Configuration, Design & Simulation Lab	-	-	2	2
5.	DT-AT-L02	Guidance & control Lab	-	-	2	2
		<b>Elective Courses</b>				
6.		Elective 1	3	-	-	3
7.		Elective 2	3	-	-	3
8.		Seminar	-	-	1	1
		Total credits				23

## 2. Communication Systems & Sensors

S. No.	Course Code	Course of study and scheme of examination	M.Tech Semester-2			Branch Defence Technology
			Periods/Week			Total Credits
		Compulsory Courses	L	T	P	
		<b>Communication Systems &amp; Sensors</b>				
1.	DT-CSS-01	Radar Technologies	4	-	-	4
2.	DT-CSS-02	Digital & satellite Communication and Navigation from Space	4	-	-	4
3.	DT-CSS-03	Tactical battlefield Communication & Electronic Warfare	4	-	-	4
4.	DT-CSS-L01	Radar Technologies Lab	-	-	2	2
5.	DT-CSS-L02	Digital & satellite Communication and Navigation from Space Lab	-	-	2	2
		<b>Elective Courses</b>				
6.		Elective 1	3	-	-	3
7.		Elective 2	3	-	-	3
8.		Seminar	-	-	1	1
		Total credits				23

## 3. High Energy Materials Technology

S. No.	Course Code	Course of study and scheme of examination	M.Tech Semester-2			Branch Defence Technology
			Periods/Week			Total Credits
		Compulsory Courses	L	T	P	
		<b>High Energy Materials Technology</b>				
1.	DT-HEM-01	High Energy Materials Modeling & Simulation	4	-	-	4
2.	DT-HEM-02	Munitions and Target Response	4	-	-	4
3.	DT-HEM-03	Manufacturing and Materials Properties of Explosives	4	-	-	4
4.	DT-HEM-L01	High Energy Materials Modeling & Simulation Lab	-	-	2	2
5.	DT-HEM-L02	Munitions and Target Response Lab	-	-	2	2
		<b>Elective Courses</b>				
6.		Elective 1	3	-	-	3
7.		Elective 2	3	-	-	3
8.		Seminar	-	-	1	1
		Total credits				23

### Elective Courses offered for Semester 2

- a. Students are expected to select the Elective-I course of their choice, provided that at least a group of 7 students should opt for the similar elective course.

S. No.	Course Code	Course of study and scheme of examination	M.Tech Semester-2			
			Elective 1 (for all Specializations )			
		Periods/Week				Total Credits
L	T	P				
1.	DT-EL3-01	Robotics (MSS, MCC)	3	-	-	3
2.	DT-EL3-02	EMI/EMC in Military Systems	3	-	-	3
3.	DT-EL3-03	Defence Electro-Optics and Imaging Systems	3	-	-	3
4.	DT-EL3-04	Structural Dynamics and Aero-elasticity	3	-	-	3
5.	DT-EL3-05	Safety, Health & Hazard Management	3	-	-	3
6.	DT-EL3-06	Fundamental of telemetry, telecomm and transponder	3	-	-	3
7.	DT-EL3-07	Jamming and ECM/ECCM technologies	3	-	-	3
8.	DT-EL3-08	Software defined Radios	3	-	-	3
9.	DT-EL3-09	Advanced Lightweight and Composite Structures	3	-	-	3
10.	DT-EL3-10	Test methodologies for DEW systems (Lasers & Microwave)	3	-	-	3
11.	DT-EL3-11	Advanced Analytical Techniques / Lab testing	3	-	-	3
12.	DT-EL3-12	Sonar System Engineering	3	-	-	3

S. No.	Course Code	Course of study and scheme of examination	M.Tech Semester-2			
			Elective 2 (for all Specializations )			
		Periods/Week				Total Credits
L	T	P				
1.	DT-EL4-01	Unmanned Aerial Vehicle Design	3	-	-	3
2.	DT-EL4-02	Naval Ocean Analysis and Prediction	3	-	-	3
3.	DT-EL4-03	Modeling & simulation of Laser Matter Interaction	3	-	-	3
4.	DT-EL4-04	Computational Aerodynamics	3	-	-	3
5.	DT-EL4-05	Launch Vehicle Design & Analysis	3	-	-	3
6.	DT-EL4-06	Acquisition, Tracking & Pointing Technology	3	-	-	3

7.	DT-EL4-07	Data acquisition, tracking & post flight analysis	3	-	-	3
8.	DT-EL4-08	Air independent propulsion & batteries	3	-	-	3
9.	DT-EL4-09	Advanced digital modulation technologies & standards	3	-	-	3
10.	DT-EL4-10	Trajectories modeling & simulation	3	-	-	3
11.	DT-EL4-11	Sensor Technology	3	-	-	3

### Semester - 3

S. No.	Course	Credit
1.	Project Dissertation- Phase 1	10
2.	Seminar/ Industrial training	4
	Total credits	14

### Semester – 4

S. No.	Course	Credit
1.	Project Dissertation Phase-2	20
	Total credits	20

#### 4. Eligibility criteria

Those who have pursued under graduation in following disciplines are eligible:

- 1) Aerospace Engineering
- 2) Aeronautical engineering
- 3) Applied Electronics and Communication Engineering
- 4) Applied Electronics and Instrumentation Engineering
- 5) Chemical Technology
- 6) Chemical engineering
- 7) Computer Science & Engineering
- 8) Computer and Communication Engineering
- 9) Computer Engineering
- 10) Computer Engineering and Applications
- 11) Computer Networking
- 12) Computer Science and Information Technology
- 13) Computer Science and Technology
- 14) Computer Technology
- 15) Electrical and Computer Engineering
- 16) Electrical and Electronics Engineering
- 17) Electrical and Instrumentation Engineering
- 18) Electrical and Power Engineering

- 19) Electrical Engineering
- 20) Electronics engineering
- 21) Electrical, Electronics and PowerEngineering
- 22) Electronics and Communicationengineering
- 23) Instrumentation engineering
- 24) Electronics, Instrumentation andControl Engineering
- 25) Electronics, Science and Engineering
- 26) Electronics and Computer Engineering
- 27) Electronics and CommunicationEngineering
- 28) Electronics and Computer Science
- 29) Electronics and Control Systems
- 30) Electronics and Power Engineering
- 31) Electronics and Telecommunication
- 32) Electronics, Instruments and ControlEngineering
- 33) Electronics System Engineering
- 34) Instrumentation and Electronics
- 35) Instrumentation Engineering
- 36) Marine Engineering
- 37) Marine Technology
- 38) Mechanical and AutomationEngineering
- 39) Mechatronics Engineering
- 40) Mechanical engineering
- 41) Metallurgical and Materials Engineering
- 42) Military engineering
- 43) Optics and Opto-electronics
- 44) Power Electronics Engineering
- 45) Radio, Physics and Electronics
- 46) Software Engineering
- 47) Structural Engineering
- 48) Telecommunication Engineering