



**REGULATION 2022 A
(in line with NEP 2020)**

**B. TECH. AERONAUTICAL ENGINEERING
CHOICE BASED CREDIT SYSTEM**

MOTTO, VISION, MISSION AND VALUE STATEMENT OF INSTITUTE

Motto

To Make Every Man a Success and No Man a Failure.

Vision

To be an International Institute of Excellence, providing a conducive environment for education with a strong emphasis on innovation, quality, research and strategic partnership blended with values and commitment to society.

Mission

- To create an ecosystem for learning and world class research.
- To nurture a sense of creativity and innovation.
- To instill highest ethical standards and values with a sense of professionalism.
- To take up activities for the development of Society.
- To develop national and international collaboration and strategic partnership with industry and institutes of excellence.
- To enable graduates to become future leaders and innovators.

Value Statement

Integrity, Innovation, Internationalization

DEPARTMENT OF AERONAUTICAL ENGINEERING
VISION

To excel in education, research, and innovation in Aeronautical Engineering

MISSION

- M1: To provide conducive academic environment through well designed curriculum, teaching and learning process imparting high quality education for research and innovation.
- M2: To demonstrate hands-on training from state-of-the-art laboratories in their academic projects and career.
- M3: To impart technical, leadership skills and life-long learning embedded with ethical values and social relevance.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

- PEO-I : Successful career and adoptability to industry:** Graduates of the programme will attain adequate academic knowledge and skills to adapt themselves in any aircraft and allied industries and have successful professional career.
- PEO-II : Modern design tools and multi-disciplinary project execution:** Graduates of the programme will have knowledge on modern design tools and apply to multi-disciplinary projects through teamwork with a high degree of professional ethics and standards.
- PEO-III : Contribution to aeronautical field and lifelong learning:** Graduates of the programme will have innovative ideas, sustained interest and potential to contribute for the development and current needs of the aeronautical industries in the country and the world.

PROGRAMME OUTCOMES (PO's)

Engineering Graduates will be able to:

- PO1 : Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

- PO2** : **Problem Analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- PO3** : **Design Development of Solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- PO4** : **Conduct Investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- PO5** : **Modern Tool Usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
- PO6** : **The Engineer & Society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- PO7** : **Environment & Sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- PO8** : **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- PO9** : **Individual & Team Work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- PO10** : **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11 : Project Management & Finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12 : Life-Long Learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES: (PSO's)

Graduates of B.Tech Aeronautical Engineering students will be able to

PSO1 : Develop an advanced ability capable of exploiting the knowledge in aeronautical engineering with innovation in design and development of new products

PSO2 : Conceive and convert the theoretical knowledge and skills in handling practical problems to compete in the area of flight vehicles professionally and ethically.

PEOs and POs:

B.Tech Aeronautical Engineering Program Outcomes (POs) leading to the achievements of the objectives (PEOs) are summarised in the following table.

Programme Educational Objectives (PEOs)	Programme Outcomes (POs)													
	1	2	3	4	5	6	7	8	9	10	11	12	PSO1	PSO2
I	3	3	3	3	3	3	2	2	3	3	3	3	3	3
II	3	3	3	3	3	3	2	2	3	3	3	3	3	3
III	3	3	3	3	3	3	2	2	3	3	3	3	3	3

YEAR 1	SEMESTER 1	Sl. No	COURSE NAME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PS O1	PS O2		
		1	Matrices and Calculus	3.00	3.00	1.40	1.50	1.00	-	-	-	-	-	-	-	-	1.40	1.60	1.40
		2	Engineering Physics	3.00	2.00	1.00	-	-	-	1.80	-	-	-	-	-	-	1.80	1.60	1.60
			OR																
		2	Engineering Materials	3.00	2.00	1.00	-	-	-	1.80	-	-	-	-	-	-	1.80	1.60	1.60
			OR																
		3	Communication Skills	-	-	-	-	-	-	-	-	2.00	2.00	3.00	2.50	2.00			
			OR																
		3	Personality Development and Soft Skills	-	-	-	-	-	-	-	2.00	-	2.00	3.00	2.00	3.00	1.00	1.50	
			OR																
		4	Programming Fundamentals using C/ Programming in Python	3.00	3.00	2.75	3.00	3.00	-	-	1.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	
			OR																
		4	Engineering Graphics and Computer Aided Design	2.40	1.40	2.00	-	2.00	-	-	1.40	1.60	1.80	-	2.00	1.25	1.33		
			OR																
		5	Design Thinking	1.40	1.20	1.60	-	1.80	2.80	2.80	2.00	2.40	2.40	2.00	2.00	2.40	2.60		
		6	Engineering Practices Lab	3.00	2.00	-	2.00	-	1.00	-	-	-	-	-	-	-	2.33	1.33	
			OR																
6	Fab Lab for Aeronautical Engineering	3	3	3	2	1	2	3		3	1	3	3	3	3	2			
	OR																		
7	Outreach (NCC) – Level I #	-	-	-	-	-	3	3	3	3	3	1	1	-	-				
	OR																		
7	Outreach (NSS, Y's Men, Rotaract) – Level I #	-	-	-	-	-	3	3	3	3	3	1	1	-	-				
	OR																		
8	Tamil (Regional Language)	-	-	-	-	-	-	2.00	-	2.00	3.00	2.00	3.00	-	-				
	Hindi (Regional Language)	-	-	-	-	-	-	2.00	-	2.00	2.50	2.00	2.00	-	-				
	Telugu (Regional Language)	-	-	-	-	-	-	2.00	-	-	3.00	2.00	2.00	-	-				
	OR																		
	8	French (Foreign Language)	-	-	-	-	-	-	2.00	-	2.00	3.00	2.00	3.00	-	-			
		German (Foreign Language)	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
		Spanish (Foreign Language)	-	-	-	-	-	-	2.00	-	2.00	3.00	2.00	3.00	-	-			
Korean (Foreign Language)		-	-	-	-	-	-	2.00	-	2.00	3.00	2.00	3.00	-	-				

		Mandarin (Foreign Language)	-	-	-	-	-	-	2.00	-	2.00	3.00	2.00	3.00	-	-
		Japanese (Foreign Language)	-	-	-	-	-	-	2.00	-	2.00	3.00	2.00	3.00	-	-
		OR														
		Universal Human Values	2.00	-	-	-	-	3.00	3.00	3.00	3.00	3.00	3.00	3.00	-	-
	9	Tamil Culture and Technology	-	-	-	-	-	-	2.00	2.00	2.00	3.00	2.00	3.00	-	-

YEAR 1	SEMESTER 2	Sl. No	COURSE NAME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PS O1	PS O2		
		1	Analytical Mathematics	3.00	2.60	1.60	1.50	1.20	-	-	-	-	-	-	-	-	1.40	1.60	1.20
		2	Engineering Physics	3.00	3.00	-	2.00	2.33	-	-	-	-	3.00	-	-	-	3.00	1.40	2.40
			OR																
		3	Engineering Materials	3.00	2.00	1.00	-	-	-	1.80	-	-	-	-	-	-	1.80	1.60	1.60
			OR																
		3	Communication Skills	-	-	-	-	-	-	-	-	2.00	2.00	3.00	2.50	2.00	-	-	
			OR																
		3	Personality Development and Soft Skills	-	-	-	-	-	-	2.00	-	2.00	3.00	2.00	3.00	1.00	1.50	-	-
			OR																
		4	Engineering Mechanics for Aeronautical and Aerospace Engineers	3	3	3	3	1	2	-	-	1	2	1	1	2	3	2	-
		5	Programming Fundamentals using C/ Programming in Python	3.00	3.00	2.75	3.00	3.00	-	-	-	1.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00
			OR																
		5	Engineering Graphics and Computer Aided Design	2.40	1.40	2.00	-	2.00	-	-	-	1.40	1.60	1.80	-	-	2.00	1.25	1.33
			OR																
		6	Engineering Practices Lab	3.00	2.00	-	2.00	-	1.00	-	-	-	-	-	-	-	-	2.33	1.33
			OR																
6	Fab Lab for Aeronautical Engineering	3	3	3	2	1	2	3	-	-	3	1	3	-	3	3	2		
	OR																		
7	Outreach (NCC) – Level I #	-	-	-	-	-	3	3	3	3	3	3	1	1	-	-	-		
	OR																		

		Outreach (NSS, Y's Men, Rotaract) – Level I #	-	-	-	-	-	3	3	3	3	3	1	1	-	-	
		Tamil (Regional Language)	-	-	-	-	-	-	2.00	-	2.00	3.00	2.00	3.00	-	-	
		Hindi (Regional Language)	-	-	-	-	-	-	2.00	-	2.00	2.50	2.00	2.00	-	-	
		Telugu (Regional Language)	-	-	-	-	-	-	2.00	-	-	3.00	2.00	2.00	-	-	
		OR															
		8	French (Foreign Language)	-	-	-	-	-	-	2.00	-	2.00	3.00	2.00	3.00	-	-
			German (Foreign Language)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			Spanish (Foreign Language)	-	-	-	-	-	-	2.00	-	2.00	3.00	2.00	3.00	-	-
			Korean (Foreign Language)	-	-	-	-	-	-	2.00	-	2.00	3.00	2.00	3.00	-	-
			Mandarin (Foreign Language)	-	-	-	-	-	-	2.00	-	2.00	3.00	2.00	3.00	-	-
			Japanese (Foreign Language)	-	-	-	-	-	-	2.00	-	2.00	3.00	2.00	3.00	-	-
			OR														
		Universal Human Values	2.00	-	-	-	-	-	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	-
9	Mandatory Course I																
	Mandatory Course I is a Non-credit course (Student shall select one course from the list given under Mandatory Course I)																

YEAR 2	SEMESTER 3	Sl. No	COURSE NAME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PS O1	PS O2
		1	Partial Differential Equations and Transforms	3.00	3.00	2.00	2.00	2.00	1.40	1.00	-	1.00	1.00	-	-	2.00	2.00
		2	Advanced Academic Writing	2.50	3.00	2.00	2.00	2.00	2.20	2.00	-	2.00	2.00	-	-	-	-
		3	Solid Mechanics	2.50	3.00	2.00	2.00	2.00	2.20	2.00	-	2.00	2.00	-	-	2.00	2.00
		4	Principles of flight	3.00	2.00	1.00	1.40	1.20	2.40	1.00	1.00	2.00	1.00	1.00	2.00	3.00	2.00
		5	Fluid Mechanics and Machinery	3.00	2.60	2.40	2.40	2.00	1.20	1.40	1.00	1.40	2.00	2.80	2.60	3.00	3.00
		6	DE 1 (May be lab integrated)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		7	Environmental Science and Sustainable Development	2.00	2.00	2.00	-	-	1.00	3.00	-	-	-	-	2.00	-	-
		8	Design Project – 1	3.00	3.00	2.00	1.00	3.00	2.00	1.00	3.00	3.00	3.00	3.00	2.00	2.67	2.33

	7	Computational Fluid Dynamics#	3	3	2	2	3	1	1	1	2	1	1	2	3	2
	8	Design Project – 4	3.00	3.00	2.67	2.00	3.00	2.00	2.00	3.00	3.00	3.00	3.00	1.00	2.00	2.00

YEAR 4	SEMESTER 7	Sl. No	COURSE NAME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PS O1	PS O2
		1	Verbal Reasoning and Interview Skills	-	2.00	2.00	2.00	-	1.50	-	-	2.00	3.00	1.00	3.00		
		2	Avionics	3.00	3.00	2.00	2.00	3.00	1.20	2.00	1.00	2.00	1.00	-	2.00	2.00	2.00
		3	Aircraft Performance, Stability and Control	3.00	3.00	3.00	2.00	-	1.00	-	1.00	2.00	2.00	2.00	2.00	3.00	3.00
		4	Civil Aviation requirements	3.00	3.00	2.00	1.00	-	1.00	2.00	2.00	3.00	3.00	1.00	1.00	2.00	3.00
		5	DE 5 (May be lab integrated)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		6	NE 4 (May be lab integrated)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		7	Research Methodology & IPR	2.40	2.80	1.20	1.20	3.00	2.40	1.80	2.00	2.20	2.60	2.00	3.00	2.00	2.00
		8	Project Phase 1	3.00	1.00	2.00	0.00	0.00	2.00	1.00	1.00	2.00	1.00	1.00	2.00	2.00	2.67

YEAR 4	SEMESTER 8	Sl. No	COURSE NAME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PS O1	PS O2
		1	Project Phase 2	3.00	3.00	2.00	2.00	3.00	1.00	1.00	1.00	3.00	1.00	3.00	1.00	2.40	2.60

DEPARTMENT ELECTIVE COURSES: VERTICALS

	Vertical 1	Vertical 2	Vertical 3	Vertical 4	Vertical 5
SEM	Structures	Aerodynamics	Propulsion	Propulsion	AME
III	Additive Manufacturing	Instrumentation for Experimental Fluid Mechanics	Fuel Safety Practices	Fuel Safety Practices	Aircraft Maintenance Practices
IV	Experimental Stress Analysis	Potential Flow Theory	Fuels and Combustion	Fuels and Combustion	Aviation Safety Management
V	Airplane Structural Design	Laminar Flow Theory	Convective and Conductive Heat Transfer	Convective and Conductive Heat Transfer	Structural Maintenance and Repair Practices
	Composite Materials and Structures	Wind Tunnel Design and its Application	Propulsion Technique for UAV	Propulsion Technique for UAV	
VI	Vibration and Aeroelasticity	Vehicle Aerodynamics	Compressors and Turbines	Compressors and Turbines	Air Transportation and Aircraft Maintenance
	Finite Element Analysis	Industrial Aerodynamics	Theory of Flames	Theory of Flames	Aircraft Powerplant maintenance and repair
VII	Fatigue and Fracture Mechanics	Hypersonic Aerodynamics	Rockets and Missiles	Rockets and Missiles	Machine Learning in Aviation Safety
	Non - Destructive Testing	Turbulence Modelling	Hybrid and Electric Propulsion	Hybrid and Electric Propulsion	Rotary Wing Maintenance Practices

Structures	Aerodynamics	Propulsion	Propulsion	AME
Additive Manufacturing	Instrumentation for Experimental Fluid Mechanics	Fuel Safety Practices	Fuel Safety Practices	Aircraft Maintenance Practices
Experimental Stress Analysis	Potential Flow Theory	Fuels and Combustion	Fuels and Combustion	Aviation Safety Management
Airplane Structural Design	Laminar Flow Theory	Convective and Conductive Heat Transfer	Convective and Conductive Heat Transfer	Structural Maintenance and Repair Practices
Composite Materials and Structures	Wind Tunnel Design and its Application	Propulsion Technique for UAV	Propulsion Technique for UAV	Transportation and Aircraft Maintenance
Vibration and Aeroelasticity	Vehicle Aerodynamics	Compressors and Turbines	Compressors and Turbines	Powerplant maintenance and repair
Finite Element Analysis	Industrial Aerodynamics	Theory of Flames	Theory of Flames	Machine Learning in Aviation Safety
Fatigue and Fracture Mechanics	Hypersonic Aerodynamics	Rockets and Missiles	Rockets and Missiles	Rotary Wing Maintenance Practices
Non - Destructive Testing	Turbulence Modelling	Hybrid and Electric Propulsion	Hybrid and Electric Propulsion	

VERTICAL 1: Structures

Sl. No	COURSE NAME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PS O1	PS O2
1	Additive manufacturing	3.00	2.00	2.50	2.50	3.00	1.00	1.00	1.00	2.00	1.50	1.00	1.00	2.00	2.00
2	Experimental Stress Analysis	3.00	1.80	3.00	2.80	1.80	-	-	-	2.00	1.00	-	2.00	3.00	2.00
3	Airplane Structural Design	2.00	2.00	2.00	1.60	2.20	1.00	2.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00
4	Composite Materials and Structures	3.00	1.80	2.20	2.00	1.40	2.00	1.00	1.00	2.00	1.00	2.00	2.00	2.00	2.00
5	Vibration and Aeroelasticity	2.00	2.00	2.60	2.60	2.60	2.20	2.60	2.00	2.40	1.60	1.00	2.00	2.60	2.60
6	Finite Element Analysis														
7	Fatigue and Fracture Mechanics	3.00	1.80	2.33	2.00	2.00	-	-	-	2.00	1.00	-	-	2.00	2.00
8	Non - Destructive Testing	3.00	1.40	1.00	1.00	3.00	1.00	1.00	1.00	3.00	2.20	1.00	2.80	3.00	2.00

VERTICAL 2: Aerodynamics

Sl. No	COURSE NAME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PS O1	PS O2
1	Instrumentation for Experimental Fluid Mechanics	3.00	2.80	2.80	2.80	2.80	-	-	-	2.80	1.80	2.60	3.00	3.00	3.00
2	Potential Flow Theory	3.00	2.60	2.40	2.40	1.60	-	-	-	1.60	2.20	2.60	3.00	2.60	2.60
3	Laminar Flow Theory	1.80	1.80	1.00	1.00	1.20	-	-	-	1.00	1.00	1.00	1.00	1.20	1.20
4	Wind Tunnel Design and its Application	1.80	1.20	1.00	1.40	1.00	-	-	-	1.00	1.00	1.00	1.00	2.00	2.00
5	Vehicle Aerodynamics	1.80	1.20	1.00	1.40	1.00	-	-	-	1.00	1.00	1.00	1.00	2.00	2.00
6	Industrial Aerodynamics	1.80	1.20	1.00	1.40	1.00	-	-	-	1.00	1.00	1.00	1.00	2.00	2.00
7	Hypersonic Aerodynamics	1.80	1.80	1.00	1.00	1.20	-	-	-	1.00	1.00	1.00	1.00	1.20	1.20
8	Turbulence Modelling	1.80	1.80	1.00	1.00	1.20	-	-	-	1.00	1.00	1.00	1.00	1.20	1.20

VERTICAL 3: Propulsion

Sl. No	COURSE NAME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PS O1	PS O2
1	Fuels safety Practices	2.00	1.60	2.40	1.20	0.00	2.20	2.60	1.80	-	-	-	2.40	2.00	2.80
2	Fuels and Combustion	3.00	2.80	2.80	2.60	2.00	1.00	1.00	-	1.60	1.00	-	2.00	3.00	2.00
3	Convective and Conductive Heat Transfer	3.00	3.00	3.00	2.40	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	3.00	2.00
4	Propulsion Technique for UAV	3.00	2.60	2.00	1.60	1.00	1.40	3.00	1.00	1.00	1.00	1.00	2.20	3.00	2.00
5	Compressors and Turbines	3.00	3.00	3.00	1.80	2.00	1.00	-	-	1.00	-	-	2.00	2.80	2.40
6	Theory of Flames	3.00	2.80	2.80	2.60	2.00	1.00	1.00	-	1.60	1.00	-	2.00	2.00	2.00
7	Rockets and Missiles	3.00	2.60	2.60	2.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	3.00	2.00
8	Hybrid and Electric Propulsion	3.00	2.00	2.00	1.00	-	1.00	1.00	1.00	1.50	-	-	2.00	3.00	2.00

VERTICAL 4: Avionics

Sl. No	COURSE NAME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PS O1	PS O2
1	Measurements & Instrumentation for Aeronautical Engineering	3.00	2.00	2.80	1.00	1.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	3.00	2.00
2	Aircraft Navigation systems	3.00	2.40	1.80	1.80	1.00	-	-	-	-	-	-	3.00	3.00	2.00
3	Aircraft Surveillance system	3.00	1.20	1.60	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	3.00	2.00
4	Design and Development of Drone	3.00	3.00	3.00	3.00	1.80	2.20	1.60	1.60	1.80	1.80	1.60	1.40	1.00	1.60
5	IoT in Aerospace and Defence Sector	3.00	2.00	1.40	1.40	1.80	1.80	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
6	Stealth Technology	3.00	3.00	2.80	3.00	1.80	1.00	1.00	1.00	2.00	1.00	1.00	2.00	2.80	2.80
7	Satellite Communication	3.00	3.00	2.00	1.00	1.00	-	-	-	-	-	-	1.00	2.00	2.00
8	Nano Satellite Design	3.00	1.00	1.33	1.50	1.00	1.00	1.00	1.00	2.00	1.00	2.00	2.00	3.00	2.00

VERTICAL 5 : AME

Sl. No	COURSE NAME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	Aircraft Maintenance practices	2.60	1.80	1.80	1.80	1.00	1.00	1.00	-	2.60	1.00	-	2.00	2.00	3.00
2	Aviation safety management	2.00	3.00	3.00	3.00	1.00	3.00	1.00	1.00	1.00	1.00	1.80	2.00	2.00	2.00
3	Structural Maintenance and repair practices	3.00	1.00	2.00	2.00	1.00	2.00	2.00	1.00	3.00	1.00	1.00	2.00	2.00	2.00
4	Air transportation and Aircraft Maintenance	3.00	3.00	3.00	3.00	1.00	1.00	2.00	2.00	3.00	1.00	2.00	2.00	2.00	2.00
5	Aircraft Powerplant maintenance and repair	3.00	3.00	1.00	2.00	1.00	2.00	2.00	2.00	3.00	2.00	1.00	3.00	2.40	2.60
6	Machine learning in aviation safety	2.80	2.40	1.60	1.60	1.60	1.80	2.00	1.00	2.00	2.00	1.00	2.60	2.60	2.40
7	Rotary Wing Maintenance Practices	3.00	3.00	3.00	3.00	1.00	1.00	2.00	2.00	3.00	1.00	2.00	2.00	2.00	2.00

B. TECH. AERONAUTICAL ENGINEERING

GENERAL COURSE STRUCTURE & THEME

A. Definition of Credit:

1 Hr. Lecture (L) per week	1 Credit
1 Hr. Tutorial (T) per week	1 Credit
1 Hr. Practical (P) per week	0.5 Credit
2 Hours Practical (P) per week	1 Credit

B. Range of Credits: In the light of the fact that a typical Model Four-year Under Graduate degree program in Engineering has about 160 credits, we have adopted 165 credits.

C. Structure of UG Program: The structure of UG program shall have essentially the following categories of courses with the breakup of credits as given:

S. No.	Category Code	Category	Breakup of Credits
1.	HS	Humanities & Social Science Courses	16
2.	BS	Basic Science Courses	24
3.	ES	Engineering Science Courses	15
4.	PC	Program Core Courses (Branch specific)	61
5.	DE	Professional Elective Courses (Branch specific) – Department Elective	15
6.	NE	Open Elective Courses (Cross Discipline Subjects) – Non Department Elective	12
7.	EEC	Employment Enhancement Courses (Project/ Summer Internship/ Seminar)	22
TOTAL			165

CURRICULUM COURSE DISTRIBUTION (BASED ON CREDITS)

Semester	HS	BS	ES	PC	DE	NE	EEC	Total Credits per semester
1	6	8	4	4				22
2	5	8	5	4				22
3	1	4	2	10	3		2	22
4	1	4		10	3	3	1	22
5	1		2	10	3	3	2	21
6	1			13	3	3	1	21
7	1		2	10	3	3	3	22
8							13	13
Total Credits	16	24	15	61	15	12	22	165

CURRICULUM COURSE DISTRIBUTION (BASED ON COURSE COUNT)

Semester	HS	BS	ES	PC	DE	NE	EEC	MC	Total Courses per semester
1	4	2	2	1					9
2	3	2	2	1				1	9
3	1	1	1	3	1		2	1	10
4	1	1		3	1	1	1	1	9
5	1		1	3	1	1	2		9
6	1			4	1	1	1		8
7	1		1	3	1	1	1		8
8							1		1
Total Courses	12	6	7	18	5	4	8	3	63

MC : Mandatory Course

CREDIT COUNT

Semester	Credit Count
1	22
2	22
3	22
4	22
5	21
6	21
7	22
8	13
	165

B. TECH. AERONAUTICAL ENGINEERING
CURRICULUM FRAMEWORK FOR SEMESTERS I TO VIII

FRAMEWORK OF CURRICULUM 2022 A (in line with NEP 2020)									
SEMESTER – I									
SL. NO	COURSE CATEGORY	COURSE CODE	NAME OF THE COURSE	L	T	P	C	S	TCH
1	BS	EMA51001	Matrices and Calculus	3	0	2	4	2	5
Any One Course to be Opted									
2	BS	EPH51001	Engineering Physics	3	0	2	4	2	5
		ECT51001	Engineering Materials						
Any One Course to be Opted									
3	HS	GGGG1001	Communication Skills	2	0	1	2	1	3
		GGGG1002	Personality Development and Soft Skills						
Any One Course to be Opted									
4	ES	ECS51009	Programming Fundamentals using C	2	0	2	3	2	4
		ECS51010	Programming in Python						
		OR							
		EME51001	Engineering Graphics and Computer Aided Design						
5	ES	EGE51002	Design Thinking	2	0	2	3	2	4
Any One Course to be Opted									
6	ES	EGE51406	Engineering Practices Lab	0	0	4	2	2	4
		EAE51407	FAB Lab for Aeronautical Engineering						
Any One Course to be Opted (Outreach)									
7	HS	EGE51404	Outreach (NCC) – Level I #	0	0	2	1	4	2
		EGE51405	Outreach (NSS, Y's Men, Rotaract) – Level I #						
Any One Course to be Opted (Indian / foreign language)									
8	HS	GGGG1008	Tamil (Regional Language)	2	0	0	2	2	2
		GGGG1009	Hindi (Regional Language)						
		GGGG1010	Telugu (Regional Language)						
		GGGG1011	French (Foreign Language)						
		GGGG1012	German (Foreign Language)						
		GGGG1013	Spanish (Foreign Language)						
		GGGG1014	Korean (Foreign Language)						
		GGGG1015	Mandarin (Foreign Language)						
		GGGG1016	Japanese (Foreign Language)						
		OR							
		EGE51001	Universal Human Values						
9	HS	ELS51006	Tamil Culture and Technology	1	0	0	1	2	1
Total				15	0	15	22	19	30

Students should choose Level I and Level II of same outreach course in the semester 1 and 2 respectively.

SEMESTER – II									
SL. NO	COURSE CATEGORY	COURSE CODE	NAME OF THE COURSE	L	T	P	C	S	TCH
1	BS	EMA51002	Analytical Mathematics	3	0	2	4	2	5
2	BS	Any One Course to be Opted		3	0	2	4	2	5
		EPH51001	Engineering Physics						
		ECT51001	Engineering Materials						
3	HS	Any One Course to be Opted		2	0	1	2	1	3
		GGGG1001	Communication Skills						
		GGGG1002	Personality Development and Soft Skills						
4	PC	EAE51001	Engineering Mechanics for Aeronautical and Aerospace Engineers	3	1	0	4	2	5
5	ES	Any One Course to be Opted		2	0	2	3	2	4
		ECS51009	Programming Fundamentals using C						
		ECS51010	Programming in Python						
		OR							
EME51001	Engineering Graphics and Computer Aided Design								
6	ES	Any One Course to be Opted		0	0	4	2	2	4
		EGE51406	Engineering Practices Lab						
		EGE 51407	FAB Lab for Aeronautical Engineering						
7	HS	Any One Course to be Opted		0	0	2	1	4	2
		EGE51410	Outreach (NCC) – Level II #						
		EGE51411	Outreach (NSS, Y's Men, Rotaract) – Level II #						
8	HS	Any One Course to be Opted (Indian / Foreign language)		2	0	0	2	2	2
		GGGG1008	Tamil (Regional Language)						
		GGGG1009	Hindi (Regional Language)						
		GGGG1010	Telugu (Regional Language)						
		GGGG1011	French (Foreign Language)						
		GGGG1012	German (Foreign Language)						
		GGGG1013	Spanish (Foreign Language)						
		GGGG1014	Korean (Foreign Language)						
		GGGG1015	Mandarin (Foreign Language)						
		GGGG1016	Japanese (Foreign Language)						
OR									
EGE51001	Universal Human Values								
9	MC	EGE5101X	Mandatory Course I Mandatory Course I is a Non-credit course (Student shall select one course from the list given under Mandatory Course I)	3	0	0	-	2	3
Total				19	1	13	22	19	32

Students should choose Level I and Level II of same outreach course in the semester 1 and 2 respectively.

FRAMEWORK OF CURRICULUM 2022 A (in line with NEP 2020)

SEMESTER – III

SL. NO	COURSE CATEGORY	COURSE CODE	NAME OF THE COURSE	L	T	P	C	S	TCH
1	BS	EMA51003	Partial Differential Equations and Transforms	3	1	0	4	1	4
2	HS	GGGG1003	Advanced Academic Writing	1	0	1	1	1	2
3	PC	EAE51002	Solid Mechanics	3	0	2	4	2	5
4	PC	EAE51003	Principles of flight	3	0	0	3	2	3
5	PC	EAE51004	Fluid Mechanics and Machinery	2	0	2	3	2	4
6	DE	EAE515xx	Department Elective-1	2	0	2	3	2	4
7	ES	EGE51003	Environmental Science and Sustainable Development	2	0	0	2	2	2
8	EEC	EAE51801	Design Project – 1	0	0	2	1	6	2
9	EEC	EAE51800	Internship -1 (To be carried out in summer after 2 nd semester and evaluated in 3 rd semester)	0	0	0	1	2	0
10	MC	EGE5102X	Mandatory Course II Mandatory Course II is a Non-credit course (Student shall select one course from the list given under Mandatory Course II)	3	0	0	0	2	3
Total				19	1	9	22	22	29

SEMESTER – IV

SL. NO	COURSE CATEGORY	COURSE CODE	NAME OF THE COURSE	L	T	P	C	S	TCH
1	BS	EMA51009	Numerical Methods	3	1	0	4	2	4
2	HS	GGGG1004	Professional Editing and Project Writing	1	0	1	1	1	2
3	PC	EAE51005	Aircraft structural Mechanics	3	0	2	4	2	5
4	PC	EAE51006	Thermodynamics	2	0	2	3	2	4
5	PC	EAE51007	Aircraft System and Instruments (Industry Collaborated Course)	2	0	2	3	2	4
6	DE	EAE515XX	DE 2 (May be lab integrated)	3	0	0	3	2	4
7	NE	EAE517XX	NE 1 (May be lab integrated)	3	0	0	3	2	3
8	EEC	EAE51802	Design Project – 2	0	0	2	1	6	2
9	MC	EGE5103X	Mandatory Course #3	3	0	0	0	2	3

			Mandatory Course 3 is a Non-credit course (Student shall select one course from the list given under Mandatory Course 3)						
Total				19	1	11	22	21	31

FRAMEWORK OF CURRICULUM 2022 A (in line with NEP 2020)

SEMESTER – V

SL. NO	COURSE CATEGORY	COURSE CODE	NAME OF THE COURSE	L	T	P	C	S	TCH
1	HS	GGGG1005	Public Speaking	1	0	1	1	1	2
2	PC	EAE51008	Aircraft Propulsion	3	0	2	4	2	5
3	PC	EAE51009	Low Speed Aerodynamics	2	0	2	3	2	4
4	PC	EAE51010	Aircraft Structures	2	0	2	3	2	4
5	DE	EAE515XX	DE 3 (May be lab integrated)	3	0	0	3	2	4
6	NE	EAE517XX	NE 2 (May be lab integrated)	3	0	0	3	2	3
7	EEC	EAE51803	Design Project – 3	0	0	2	1	6	2
8	ES	EGE51004	Entrepreneurship	2	0	0	2	6	2
9	EEC	EAE51807	Internship -2 (to be evaluated in 5 th semester. To be carried out in summer after 4 th semester))	0	0	0	1	0	0
Total				15	0	11	21	23	26

SEMESTER – VI

SL. NO	COURSE CATEGORY	COURSE CODE	NAME OF THE COURSE	L	T	P	C	S	TCH
1	HS	GGGG1006	English for Competitive Examinations	1	0	1	1	1	2
2	PC	EAE51011	Compressible Aerodynamics	3	0	2	4	2	5
3	PC	EAE51012	Rocket and Advance Propulsion	2	0	2	3	2	4
4	PC	EAE51013	Flight Control theory	2	0	2	3	2	4
5	DE	EAE515XX	DE 4 (May be lab integrated)	3	0	0	3	2	4
6	NE	EAE517XX	NE 3 (May be lab integrated)	3	0	0	3	2	3
7	PC	EAS51009	Computational Fluid Dynamics#	2	0	2	3	6	4
8	EEC	EAE51804	Design Project – 4	0	0	2	1	6	2
Total				15	0	13	21	23	28

FRAMEWORK OF CURRICULUM 2022 A (in line with NEP 2020)									
SEMESTER – VII									
SL. NO	COURSE CATEGORY	COURSE CODE	NAME OF THE COURSE	L	T	P	C	S	TCH
1	HS	GGGG1007	Verbal Reasoning and Interview Skills	1	0	1	1	1	2
2	PC	EAE51015	Avionics	3	0	2	4	2	5
3	PC	EAE51016	Aircraft Performance, Stability and Control	2	1	0	3	2	3
4	PC	EAE51017	Civil Aviation requirements	3	0	0	3	2	3
5	DE	EAE515XX	DE 5 (May be lab integrated)	3	0	0	3	2	4
6	NE	EAE517XX	NE 4 (May be lab integrated)	3	0	0	3	2	3
7	ES	EGE51005	Research Methodology & IPR	2	0	0	2	2	2
8	EEC	EAE51805	Project Phase 1	0	0	6	3	6	6
Total				16	1	11	22	19	28
SEMESTER – VIII									
SL. NO	COURSE CATEGORY	COURSE CODE	NAME OF THE COURSE	L	T	P	C	S	TCH
1	EEC	EAE51806	Project Phase 2	0	0	26	13	10	24
Total				0	0	26	13	10	24
Total Credits for the Program							165		

MANDATORY COURSES I							
S.No	Course Code	Course Title	Periods Per week			Total Contact Periods	Credits
1	EGE51011	Introduction to Women and Gender Studies	3	0	0	3	Non Credit Course
2	EGE51012	Public and Personal Administration	3	0	0	3	Non Credit Course
3	EGE51013	Constitution of India	3	0	0	3	Non Credit Course
4	EGE51014	Law for Engineers	3	0	0	3	Non Credit Course

5	EGE51015	Indian Knowledge System (IKS)	3	0	0	3	Non Credit Course
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MANDATORY COURSES II

S.No..	Course Code	Course Title	Periods Per week			Total Contact Periods	Credits
1	EGE51021	Traditional Indian Systems of Medicine and Therapies	3	0	0	3	Non Credit Course
2	EGE51022	History of Science and Technology in India	3	0	0	3	Non Credit Course
3	EGE51023	Political and Economic Thought for a Humane Society	3	0	0	3	Non Credit Course
4	EGE51024	State, Nation-Building and Politics in India	3	0	0	3	Non Credit Course
5	EGE51025	Industrial Safety	3	0	0	3	Non Credit Course

MANDATORY COURSES III

S.No.	Course Code	Course Title	Periods Per week			Total Contact Periods	Credits
1	EGE51031	Principles of Management	3	0	0	3	Non Credit Course
2	EGE51032	Human Resource Management	3	0	0	3	Non Credit Course
3	EGE51033	Green Technology	3	0	0	3	Non Credit Course
4	EGE51034	Industrial Management	3	0	0	3	Non Credit Course
5	EGE51035	Fintech and Financing new Business	3	0	0	3	Non Credit Course

DEPARTMENT ELECTIVE – 2									
S NO	COURSE CATEGORY	COURSE CODE	NAME OF THE COURSE	L	T	P	C	S	TCH
1	DE	EAE51506	Experimental Stress Analysis	2	0	2	3	2	4
2	DE	EAE51507	Potential Flow Theory	3	0	0	3	2	3
3	DE	EAE51508	Fuels and Combustion	3	0	0	3	2	3
4	DE	EAE51509	Aircraft Navigation systems	3	0	0	3	2	3
5	DE	EAE51510	Aviation safety management	3	0	0	3	2	3
DEPARTMENT ELECTIVE – 3									
S NO	COURSE CATEGORY	COURSE CODE	NAME OF THE COURSE	L	T	P	C	S	TCH
1	DE	EAE51511	Airplane Structural Design	3	0	0	3	2	3
2	DE	EAE51512	Composite Materials and Structures	2	0	2	3	2	4
3	DE	EAE51513	Laminar flow Theory	3	0	0	3	2	3
4	DE	EAE51514	Wind Tunnel Design and its Application	3	0	0	3	2	3
5	DE	EAE51515	Convective and Conductive Heat Transfer	3	0	0	3	2	3
6	DE	EAE51516	Propulsion Techniques for UAV	3	0	0	3	2	3
7	DE	EAE51517	Aircraft Surveillance system	3	0	0	3	2	3
8	DE	EAE51518	Design and Development of Drone	2	0	2	3	2	4
9	DE	EAE51519	Structural Maintenance and repair practices	2	0	2	3	2	4
DEPARTMENT ELECTIVE – 4									
S NO	COURSE CATEGORY	COURSE CODE	NAME OF THE COURSE	L	T	P	C	S	TCH
1	DE	EAE51520	Vibration and Aeroelasticity	3	0	0	3	2	3
2	DE	EAE51521	Finite Element Analysis	3	0	0	3	2	3
3	DE	EAE51522	Vehicle Aerodynamics	3	0	0	3	2	3
4	DE	EAE51523	Industrial Aerodynamics	3	0	0	3	2	3
5	DE	EAE51524	Compressors and Turbines	3	0	0	3	2	3
6	DE	EAE51525	Theory of Flames	3	0	0	3	2	3
7	DE	EAE51526	IOT in Aerospace and Defense Sector	3	0	0	3	2	3
8	DE	EAE51527	Stealth Technology	3	0	0	3	2	3
9	DE	EAE51528	Air transportation and Aircraft Maintenance	3	0	0	3	2	3
10	DE	EAE51529	Aircraft Powerplant maintenance and repair	2	0	2	3	2	4

DEPARTMENT ELECTIVE – 5									
S NO	COURSE CATEGORY	COURSE CODE	NAME OF THE COURSE	L	T	P	C	S	TCH
1	DE	EAE51530	Fatigue and fracture mechanics	3	0	0	3	2	3
2	DE	EAE51531	Non- Destructive Testing	2	0	2	3	2	4
3	DE	EAE51532	Hypersonic Aerodynamics	3	0	0	3	2	3
4	DE	EAE51533	Turbulence Modelling	3	0	0	3	2	3
5	DE	EAE51534	Rockets and Missiles	3	0	0	3	2	3
6	DE	EAE51535	Hybrid and Electrical Propulsion	3	0	0	3	2	3
7	DE	EAE51536	Satellite Communication	3	0	0	3	2	3
8	DE	EAE51537	Nano Satellite Design	3	0	0	3	2	3
9	DE	EAE51538	Machine learning in aviation safety	3	0	0	3	2	3
10	DE	EAE51539	Rotary Wing Maintenance	2	0	2	3	2	4

NON-DEPARTMENTAL ELECTIVES

LIST OF NON-DEPARTMENTAL ELECTIVES									
Non-Department Elective-1									
SEM	COURSE CATEGORY	COURSE CODE	NAME OF THE COURSE	L	T	P	C	S	TCH
4	NE	EAE51700	Aircraft constructions for Beginners	3	0	0	3	2	3
4	NE	EAE51701	Applications of Aerodynamics	3	0	0	3	2	3
4	NE	EAE51702	Introduction to air breathing propulsion	3	0	0	3	2	3
4	NE	EAE51703	UAV Photogrammetry	3	0	0	3	2	3

Non-Department Elective-2									
SEM	COURSE CATEGORY	COURSE CODE	NAME OF THE COURSE	L	T	P	C	S	TCH
5	NE	EAE51704	Aerodynamics for Industrial application	3	0	0	3	2	3
5	NE	EAE51705	Heat Transfer	3	0	0	3	2	3
5	NE	EAE51706	Modern Warfare	3	0	0	3	2	3
5	NE	EAE51707	Aircraft Maintenance Management	3	0	0	3	2	3

Non-Department Elective-3									
SEM	COURSE CATEGORY	COURSE CODE	NAME OF THE COURSE	L	T	P	C	S	TCH
6	NE	EAE51708	Self-healing and Functional coating materials	3	0	0	3	2	3
6	NE	EAE51709	Machine learning and IOT for Drones	3	0	0	3	2	3
6	NE	EAE51710	Introduction to NDT	3	0	0	3	2	3
6	NE	EAE51711	Introduction to GNSS systems and its applications	3	0	0	3	2	3

Non-Department Elective-4									
SEM	COURSE CATEGORY	COURSE CODE	NAME OF THE COURSE	L	T	P	C	S	TCH
7	NE	EAE51712	Finite element methods for Engineers	3	0	0	3	2	3
7	NE	EAE51713	Air Transportation Management	3	0	0	3	2	3
7	NE	EAE51714	Satellite Image Processing	3	0	0	3	2	3

HONORS COURSES OFFERED BY DEPARTMENT OF AERONAUTICAL ENGINEERING

FRAMEWORK OF CURRICULUM 2022 (in line with NEP 2020)									
HONORS IN AERODYNAMICS									
SL. NO	COURSE CATEGORY	COURSE CODE	NAME OF THE COURSE	L	T	P	C	S	TC H
1	Honours	EAE51900	Supersonic Aerodynamics	3	0	0	3	2	3
2	Honours	EAE51901	Turbulence Theory	3	0	0	3	2	3
3	Honours	EAE51902	Atmospheric Boundary Layer	3	0	0	3	2	3
4	Honours	EAE51903	Helicopter Aerodynamics and Dynamics	3	0	0	3	2	3

HONORS IN PROPULSION									
SL. NO	COURSE CATEGORY	COURSE CODE	NAME OF THE COURSE	L	T	P	C	S	TC H
1	Honours	EAE51904	Spray And Droplet Dynamics	3	0	0	3	2	3
2	Honours	EAE51905	Hybrid Jet Engine Propulsion	3	0	0	3	2	3
3	Honours	EAE51906	Combustion Theory and Modelling	3	0	0	3	2	3
4	Honours	EAE51907	Unsteady Aerodynamics and Aeroelasticity of Turbomachines	3	0	0	3	2	3

HONORS IN AIRCRAFT STRUCTURES

SL. NO	COURSE CATEGORY	COURSE CODE	NAME OF THE COURSE	L	T	P	C	S	TC H
1	Honours	EAE51908	Aeroelasticity	3	0	0	3	2	3
2	Honours	EAE51909	Aerospace Structural Health Monitoring	3	0	0	3	2	3
3	Honours	EAE51910	Vibration And Structural Dynamics	3	0	0	3	2	3
4	Honours	EAE51911	Smart Materials and Structures	3	0	0	3	2	3

HONORS IN SATELLITE TECHNOLOGY

SL. NO	COURSE CATEGORY	COURSE CODE	NAME OF THE COURSE	L	T	P	C	S	TC H
1	Honours	EAS51900	Satellite Technology and its Application	3	0	0	3	2	3
2	Honours	EAS51901	Satellite System Configuration	3	0	0	3	2	3
3	Honours	EAS51902	Structural and Thermal Mechanisms of Satellite	3	0	0	3	2	3
4	Honours	EAS51903	Satellite Constellation Optimization	3	0	0	3	2	3

HONORS IN UAV

SL. NO	COURSE CATEGORY	COURSE CODE	NAME OF THE COURSE	L	T	P	C	S	TC H
1	Honours	EAE51912	Introduction to UAV & its Design Principles	3	0	0	3	2	3
2	Honours	EAE51913	UAV Materials and Fabrication methodologies	3	0	0	3	2	3
3	Honours	EAE51914	Aerodynamics of UAV	3	0	0	3	2	3
4	Honours	EAE51915	UAV Path Planning, Mission Control & Data Processing	3	0	0	3	2	3