

PSN COLLEGE OF ENGINEERING AND TECHNOLOGY

(An Autonomous Institution Recognised by AICTE, New Delhi
and affiliated to Anna University, Chennai)
Accredited with A+ Grade by NAAC. An ISO 9001:2015 Certified Institution
Melathediyoor, Tirunelveli – 627 152

B.E. AERONAUTICAL ENGINEERING



Curriculum and Syllabus

SEMESTER I TO VI

and

VERTICAL 1 To 8

Regulation 2022

VISION AND MISSION OF THE INSTITUTE:

Institution Vision	To emerge as a pioneer institute inculcating engineering education, skills, research, values and ethics.	
Institution Mission	IM-1	To achieve greater heights of excellence in technical knowledge and skill development through innovative teaching and learning practices.
	IM-2	To develop the state of art infrastructure to meet the demands of technological revolution.
	IM-3	To improve and foster research in all dimensions for betterment of society.
	IM-4	To develop individual competencies to enhance innovation, employability and entrepreneurship among students.
	IM-5	To instill higher standards of discipline among students, inculcating ethical and moral values for societal harmony and peace.

VISION AND MISSION OF THE DEPARTMENT:

Department Vision	The Department of Aeronautical Engineering will strive and achieve the global recognition as a center of Excellence by imparting quality education, leading to graduates becoming professionals with specialized knowledge in Aeronautical Engineering.	
Department Mission	DM-1	To prepare the students to acquire good fundamental knowledge in various fields of Aeronautical Engineering, develop problem solving skills and learn application oriented concepts.
	DM-2	To prepare the students to have good social, moral and ethical values.
	DM-3	To provide conducive environment to enhance the potential for sponsored research and consultancy projects.

Program Outcomes (POs):

PO's No	KNOWLEDGE	STATEMENTS	APPLIANCE
1	Engineering Knowledge	Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.	Theory/ Practical / Project work
2	Problem Analysis	Identify, formulate, research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.	Theory / Practical / Projects
3	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.	Theory / Practical / Projects
4	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.	Theory / Practical
5	Modern Tool usage	Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.	Theory / Practical / Project work
6	The Engineer and 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.	Theory / Industrial visit / In plant training
7	Environment and Sustainability	Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.	Theory / Industrial Visit/ In plant Training

8	Ethics	Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.	Theory / Industrial visit / In plant training
9	Individual and Team Work	Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.	Projects
10	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.	Projects/ Seminar/ Mini Project
11	Project Management and 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.	Projects
12	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.	Projects / Higher Studies

Program Specific Outcomes [PSOs]:

PSO-1 : Graduates will be able to design and analyze various aircraft materials and structures.

PSO-2 : Graduates will be able to develop solutions for various aerodynamic, propulsion and control systems used in aircrafts.

PSO-3 Identify and apply the knowledge of aeronautical engineering for industrial applications.

CURRICULUM								
Sem - 01								
S.No	Course Code	Course Name	Classification		L	T	P	C
1	IC610001	Professional English I	ICC	Theory	2	0	0	2
2	IC610002	Matrices and Calculus	ICC	Theory	2	1	0	3
3	IC610003	Engineering Physics	ICC	Theory	3	0	0	3
4	IC610004	Engineering Chemistry	ICC	Theory	3	0	0	3
5	CS610005	Problem Solving and 'C' Programming	ICC	Theory	3	0	0	3
6	ME610006	Engineering Graphics with CAD	ICC	Theory with Practical Component	2	0	2	3
7	IP610101	Physics & Chemistry Laboratory	ICC	Practical	0	0	3	1.5
8	IP610102	Programming in 'C' Laboratory	ICC	Practical	0	0	3	1.5
9		NCC/NSS/NSO *	IMC	Institute Mandatory	1*	0	0	0
10	IC610007	Tamil marabu/Heritage of Tamil	ICC	Theory	1	0	0	1
		Total			16	1	8	21

Sem - 02								
11	IC620008	Professional English II	ICC	Theory with Practical Component	2	0	2	3
12	IC620009	Transforms & Partial Differential Equations	ICC	Theory	2	1	0	3
13	IC620010	Engineering Materials (for Non-Circuit Branches)	ICC	Theory	3	0	0	3
	IC620011	Semiconductor Physics (for Circuit Branches)			3	0	0	
14	ME620012	Engineering Mechanics (for Non Circuit Branches)	PCC	Theory with project	3	0	0	3
	CS620013	Fundamentals of Artificial Intelligence (for Circuit Branches)			3	0	0	
15	CS620014	Python Programming	ICC	Theory	3	0	0	3
16	ME620015	Basic Engineering	ICC	Theory	3	0	0	3
17	IP620103	Python Laboratory	ICC	Practical	0	0	3	1.5
18	IP620104	Engineering Practice laboratory	ICC	Practical	0	0	3	1.5

19	IM610401	Environmental Studies	IMC	Institute Mandatory	2*	0	0	0
20	IC620016	Tamils and Technology	ICC	Theory	1	0	0	1
		Total			17	1	8	22

Sem - 03								
21	IC630017	Numerical Methods and Statistics	ICC	Theory	3	0	0	3
22	AE630201	Aero Engineering Thermodynamics	PCC	Theory	3	0	0	3
23	ME630202	Fluid Mechanics and Machinery	PCC	Theory	3	0	0	3
24	AE630202	Solid Mechanics for Aeronautical Engineering	PCC	Theory with project	3	0	0	3
25	AE630203	Fundamentals of Aeronautics	PCC	Theory with Practical Component	2	0	2	3
26		Professional Elective-1	PEC	Theory	3	0	0	3
27	ME630301	Fluid Mechanics and Machinery Laboratory	PCC	Practical	0	0	3	1.5
28	AE630301	Solid Mechanics and Thermal Engineering Laboratory	PCC	Practical	0	0	3	1.5
29	AE630501	Integrated Aptitude Skills - I (Lower)	EEC	Skill based course	0	0	1	0.5 [#]
30	IM630402	Universal Human Values	IMC	Theory	2*	0	0	0
		Total			17	0	9	21

Sem - 04								
31	IC640018	Boundary Value Problems and Probability distributions	ICC	Theory	3	0	0	3
32	AE640204	Aerodynamics - I	PCC	Theory with Practical Component	2	0	2	3
33	AE640205	Aircraft Structures - I	PCC	Theory with project	3	0	0	3
34	AE640206	Propulsion - I	PCC	Theory	3	0	0	3
35		Professional Elective-2	PEC	Theory	3	0	0	3
36		Institute elective -1	IEC	Theory	3	0	0	3
37	AE640302	Aerodynamics Laboratory	PCC	Practical	0	0	3	1.5
38	AE640303	Computer Aided Drafting of Aircraft Components	PCC	Practical	0	0	3	1.5

39	AE640502	Integrated Aptitude Skills - II (Lower)	EEC	skill based course	0	0	1	0.5 [#]
40		In plant Training (2 Weeks)	IMC	-				0
		Total			17	0	9	21

Sem - 05								
41	AE650207	Propulsion - II (Rocket Propulsion)	PCC	Theory with Practical Component	2	0	2	3
42	AE650208	Aircraft Structures - II	PCC	Theory with project	3	0	0	3
43	AE650209	Aerodynamics - II	PCC	Theory	2	1	0	3
44		Institute Elective -2	IEC	Theory	3	0	0	3
45		Professional Elective-3	PEC	Theory	3	0	0	3
46		Professional Elective-4	PEC	Theory	3	0	0	3
47	AE650304	Aircraft Structures Laboratory	PCC	Practical	0	0	3	1.5
48	AE650305	Surface and Solid Modelling of Aircraft Components	PCC	Practical	0	0	3	1.5
49	AE650503	Integrated Aptitude Skills - I (Higher)	EEC	skill based course	0	0	2	1 [#]
50	AE650801	Programme Mandatory	PMC	Theory	2*	0	0	0
		Total			16	1	10	21

Sem - 06								
51	AE660210	Aircraft Structures and Repair	PCC	Theory with Practical Component	2	0	2	3
52	AE660211	Flight Dynamics	PCC	Theory with project	3	0	0	3
53	AE660212	Finite Element Analysis	PCC	Theory	2	1	0	3
54		Institute Elective -3	IEC	Theory	3	0	0	3
55		Professional Elective-5	PEC	Theory	3	0	0	3
56		Professional Elective-6	PEC	Theory	3	0	0	3
57	AE660306	Aircraft Design Project - I	PCC	Practical	0	0	3	1.5
58	AE660307	Simulation of Aircraft Structural Components	PCC	Practical	0	0	3	1.5
59	ME660504	Training in centre for Excellence in Robotics, Sensor and PLC	EEC	Skill based course	0	0	2	1 [#]
60	IM660403	Professional Ethics	IMC	Theory	2*	0	0	0
61		Internship	IMC					0

		Total			16	1	10	21
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Sem - 07								
62	AE670213	Computational Fluid Dynamics	PCC	Theory	2	1	0	3
63	AE670214	Quality and Reliability Engineering	PCC	Theory with project	3	0	0	3
64	AE670215	Composite Materials and Structures	PCC	Theory with Practical Component	2	0	2	3
65		Institute elective -3	IEC	Theory	3	0	0	3
66		Professional elective-7	PEC	Theory	3	0	0	3
67		Professional elective-8	PEC	Theory	3	0	0	3
68	AE670308	Aircraft Design Project - II	PCC	Practical	0	0	3	1.5
69	AE670309	Computational Fluid Dynamics Laboratory	PCC	Practical	0	0	3	1.5
70	MG670019	Innovation Entrepreneurship and Start-ups	ICC	Theory	3	0	0	3
71	AE670505	Advanced Career Development	EEC	Skill based course	0	0	2	1 [#]
		Total			19	1	10	24

Sem - 08								
72	AE680506	Project Work	EEC	Practical	0	0	20	10
SUMMARY								
SEM	1	2	3	4	5	6	7	8
Credit	21	22	21	21	21	21	24	10
Total	161							

Abbreviation	Particulars
ICC	Institute core Course (includes Basic science, Engineering science, humanities & social science including management course)
PCC	Professional Core Course
PEC	Professional Elective Course
IEC	Institute Elective Course (open electives)
EEC	Employability Enhancement course
IMC	Institute Mandatory Course
PMC	Programme Mandatory Course

Vertical-1 - AERODYNAMICS AND PROPULSION

S. No.	Course Code	Course Title	Classification		L	T	P	C
1	AE606101	Aircraft Design	PEC	Theory	3	0	0	3
2	AE606102	Advanced Propulsion Systems	PEC	Theory	3	0	0	3
3	AE606103	Hypersonic Aerodynamics	PEC	Theory	3	0	0	3
4	AE606104	High Speed Aerodynamics (NPTEL)	PEC	Theory	3	0	0	3
5	AE606105	Wind Tunnel Techniques (NPTEL)	PEC	Theory	3	0	0	3
6	AE606106	Structural Dynamics (NPTEL)	PEC	Theory	3	0	0	3
7	AE606107	Aerospace Propulsion (NPTEL)	PEC	Theory	3	0	0	3
8	AE606108	Gas Dynamics and Jet Propulsion	PEC	Theory	3	0	0	3

Vertical-2 - AEROSPACE STRUCTURES

S. No.	Course Code	Course Title	Classification		L	T	P	C
1	AE606201	Fatigue and Fracture Mechanism (NPTEL)	PEC	Theory	3	0	0	3
2	AE606202	Experimental Stress Analysis (NPTEL)	PEC	Theory	3	0	0	3
3	AE606203	Aerospace Materials	PEC	Theory	3	0	0	3
4	AE606204	Additive Manufacturing (NPTEL)	PEC	Theory	3	0	0	3
5	AE606205	Non-Destructive Testing and Evaluation (NPTEL)	PEC	Theory	3	0	0	3

6	AE606206	Aerospace Manufacturing Technology	PEC	Theory	3	0	0	3
7	AE606207	Aircraft Stress Analysis	PEC	Theory	3	0	0	3
8	AE606208	Nano Materials and Aero Applications	PEC	Theory	3	0	0	3
9	AE606209	Aircraft High Temperature Materials	PEC	Theory	3	0	0	3

Vertical-3-AVIONICS AND DRONE TECHNOLOGY

S. No	Course Code	Course Title	Classification		L	T	P	C
			PEC	Theory				
1	AE606301	Avionics	PEC	Theory	3	0	0	3
2	AE606302	Design of UAV Systems (NPTEL)	PEC	Theory	3	0	0	3
3	AE606303	Aerodynamics of Drones	PEC	Theory	3	0	0	3
4	AE606304	Control Engineering	PEC	Theory	3	0	0	3
5	AE606305	Introduction to PLC (NPTEL)	PEC	Theory	3	0	0	3
6	AE606306	Drone Technologies	PEC	Theory	3	0	0	3
7	AE606307	Geographical Information Systems (NPTEL)	PEC	Theory	3	0	0	3
8	AE606308	Guidance and Control	PEC	Theory	3	0	0	3
9	AE606309	Navigation and Communication Systems	PEC	Theory	3	0	0	3

Vertical-4-ROCKETS AND MISSILES

S. No.	Course Code	Course Title	Classification		L	T	P	C
			PEC	Theory				
1	AE606401	Basics of Rockets and missiles	PEC	Theory	3	0	0	3
2	AE606402	Missile Aerodynamics	PEC	Theory	3	0	0	3
3	AE606403	Space Mechanics	PEC	Theory	3	0	0	3
4	AE606404	Cryogenics (NPTEL)	PEC	Theory	3	0	0	3
5	AE606405	Remote Sensing Concepts	PEC	Theory	3	0	0	3
6	AE606406	Missile Guidance and Control (NPTEL)	PEC	Theory	3	0	0	3
7	AE606407	Chemical Rockets	PEC	Theory	3	0	0	3
8	AE606408	Launch Vehicle Technology	PEC	Theory	3	0	0	3
9	AE606409	Combustion Theory	PEC	Theory	3	0	0	3

Vertical-5- AIRCRAFT MAINTENANCE

S. No.	Course Code	Course Title	Classification		L	T	P	C
			PEC	Theory				
1	AE606501	Airframe Maintenance and repair	PEC	Theory	3	0	0	3
2	AE606502	Aircraft General Engineering and Maintenance and Practices.	PEC	Theory	3	0	0	3
3	AE606503	Civil Aviation Regulations	PEC	Theory	3	0	0	3
4	AE606504	Air Traffic Control (NPTEL)	PEC	Theory	3	0	0	3
5	AE606505	Aircraft Engine Maintenance and Repair	PEC	Theory	3	0	0	3
6	AE606506	Aircraft Overhauling	PEC	Theory	3	0	0	3
7	AE606507	Sensors and Instrumentation (NPTEL)	PEC	Theory	3	0	0	3
8	AE606508	Helicopter Maintenance (NPTEL)	PEC	Theory	3	0	0	3
9	AE606509	Air Transportation and Aircraft Maintenance Engineering	PEC	Theory	3	0	0	3

Vertical-6 - AERO MANAGEMENT AND SAFETY

S. No.	Course Code	Course Title	Classification		L	T	P	C
			PEC	Theory				
1	AE606601	Airport Management	PEC	Theory	3	0	0	3
2	AE606602	Crisis Management in Aviation Industry	PEC	Theory	3	0	0	3
3	AE606603	Aircraft Production and Planning Management	PEC	Theory	3	0	0	3
4	AE606604	Operational Management	PEC	Theory	3	0	0	3
5	AE606605	Operation and Supply Chain Analytics	PEC	Theory	3	0	0	3
6	AE606606	Essentials of Entrepreneurship (NPTEL)	PEC	Theory	3	0	0	3
7	AE606607	Industrial Fire Safety (NPTEL)	PEC	Theory	3	0	0	3
8	AE606608	Energy Conservation and Management (NPTEL)	PEC	Theory	3	0	0	3
9	AE606609	Air Lines Operation and Scheduling	PEC	Theory	3	0	0	3

Vertical-7-DIVERSIFIED COURSES

S. No.	Course Code	Course Title	Classification		L	T	P	C
1	AE606701	Design of Gas Turbine Engine Components	PEC	Theory	3	0	0	3
2	AE606702	Vibration and aero elasticity (NPTEL)	PEC	Theory	3	0	0	3
3	AE606703	Manufacturing process	PEC	Theory	3	0	0	3
4	AE606704	Turbo Machines (NPTEL)	PEC	Theory	3	0	0	3
5	AE606705	Helicopter Theory (NPTEL)	PEC	Theory	3	0	0	3
6	AE606706	Design of Non-Air Breathing Engine	PEC	Theory	3	0	0	3
7	MA606707	Mechatronics (NPTEL)	PEC	Theory	3	0	0	3
8	AE606304	Project Management	PEC	Theory	3	0	0	3
9	AE606709	Computer Aided Design and Analysis	PEC	Theory	3	0	0	3

Vertical-8- DIVERSIFIED COURSES

S. No.	Course Code	Course Title	Classification	Course Category	L	T	P	C
1	AE606801	Boundary Layer Theory (NPTEL)	PEC	Theory	3	0	0	3
2	AE606802	Aero Elasticity	PEC	Theory	3	0	0	3
3	AE606803	Heat Transfer (NPTEL)	PEC	Theory	3	0	0	3
4	AE606804	Grid Generation Techniques	PEC	Theory	3	0	0	3
5	AE606805	Advanced Vehicle Engineering	PEC	Theory	3	0	0	3
6	AE606806	Post Processing in Drone Surveying	PEC	Theory	3	0	0	3
7	AE606807	Flexible Manufacturing Systems (Common to MAE, Mech and Aero)	PEC	Theory	3	0	0	3
8	MA606203	Aircraft Systems and Instruments	PEC	Theory	3	0	0	3
9	AE606808	MEMS (NPTEL)	PEC	Theory	3	0	0	3