



INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad - 500 043

Department of Aeronautical Engineering

Attainment of Program Outcomes (POs) and Program Specific Outcomes (PSOs) of 2020 - 2024 batch (IARE – UG20)

Subject Code	Course title	Program Outcomes (POs)												Program Specific Outcomes (PSOs)			
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3	
AHSC01	English	-	-	-	-	-	-	-	-	-	-	1.20	-	-	-	-	-
AHSC02	Linear Algebra and Calculus	1.20	1.20	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AHSC03	Engineering Physics	1.20	1.20	-	1.20	-	-	-	-	-	-	-	-	-	-	-	1.20
ACSC01	Python Programming	1.30	1.20	1.20	-	1.30	-	-	-	-	-	1.20	-	1.20	1.30	-	1.20
AHSC04	English Language and Communication Skills Laboratory	-	-	-	-	-	-	-	-	-	2.10	2.10	-	-	-	-	-
AHSC05	Physics Laboratory	0.70	0.70	-	0.70	-	-	-	-	-	-	-	-	-	-	-	0.70
ACSC02	Python Programming Laboratory	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	-	0.60	0.60	-	-
AHSC06	Chemistry	2.50	2.30	-	-	-	-	-	2.90	-	-	-	-	-	-	-	-
AHSC07	Mathematical Transform Techniques	1.30	1.70	-	1.80	-	-	-	-	-	-	-	-	-	1.50	-	-
AMEC01	Engineering Mechanics	1.10	1.20	1.20	1.20	-	0.90	-	-	-	-	-	-	-	-	-	1.20
AEEC01	Basic Electrical Engineering	1.40	2.00	-	-	-	-	-	-	-	-	-	-	-	1.70	-	-
ACSC06	Experiential Engineering Education (ExEEEd)-Academic Success	3.00	-	3.00	3.00	-	3.00	3.00	3.00	3.00	3.00	3.00	3.00	-	3.00	3.00	-
AMEC02	Manufacturing Practice	3.00	-	3.00	-	-	3.00	3.00	-	3.00	-	-	-	-	3.00	-	-
AMEC03	Computer Aided Engineering Drawing	0.30	-	0.30	-	0.30	-	-	-	-	0.30	0.30	-	0.30	-	-	0.30
ACSC03	Programming for Problem Solving Laboratory	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10

AHSC08	Probability and Statistics	1.50	1.20	-	1.50	1.70	-	-	-	-	-	-	-	-	-	-
AAEC01	Mechanics of Solids	1.20	1.20	-	-	-	-	-	-	-	-	-	-	-	1.20	-
AAEC02	Engineering Thermodynamics	0.80	0.80	0.90	-	-	-	-	-	-	-	-	-	-	-	0.80
AAEC03	Fluid Dynamics	1.60	1.60	1.40	1.80	-	-	-	-	-	-	-	1.50	-	1.60	1.70
ACSC08	Data Structures	1.80	1.80	1.70	1.90	1.60	-	-	-	-	1.60	-	1.60	-	-	-
ACSC09	Experiential Engineering Education (ExEEd) - Prototype / Design Building	3.00	3.00	3.00	3.00	-	-	-	-	3.00	3.00	3.00	3.00	3.00	3.00	3.00
AAEC04	Fluid Dynamics Laboratory	0.90	-	0.90	-	0.90	-	-	-	-	-	-	-	-	-	0.90
AAEC05	Mechanics of Solids Laboratory	3.00	3.00	-	-	-	3.00	-	-	3.00	3.00	-	-	-	3.00	-
ACSC10	Data Structures Laboratory	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	-	2.30	-	2.30	-	-	2.30
AAEC06	Aerospace Structures	1.20	1.10	-	1.80	-	-	-	-	-	-	-	-	1.20	-	1.80
AAEC07	Aircraft Propulsion	0.70	0.70	-	0.80	-	-	-	-	-	-	-	-	0.50	-	-
AAEC08	Aerodynamics	1.00	1.00	1.00	0.70	0.70	-	-	-	-	-	-	0.60	1.00	-	-
AAEC09	Flight Mechanics	1.20	1.20	1.20	1.20	1.20	-	-	-	-	-	-	1.20	-	1.20	1.20
AAEC10	Aircraft Production Technology	1.10	-	-	-	-	-	1.00	-	-	-	-	1.20	-	1.10	-
ACSC14	Experiential Engineering Education (ExEEd) - Fabrication / Model Development	2.30	-	2.30	2.30	2.30	2.30	2.30	-	2.30	2.30	-	-	2.30	2.30	2.30
AAEC11	Aerospace Structures Laboratory	2.30	2.30	2.30	-	-	2.30	2.30	-	2.30	2.30	-	-	-	2.30	-
AAEC12	Aerodynamics and Propulsion Laboratory	2.70	2.70	2.70	-	-	2.70	-	-	2.70	2.70	-	-	-	-	2.70
AAEC13	Aircraft Production Technology Laboratory	3.00	-	-	-	-	3.00	3.00	-	3.00	3.00	-	-	-	3.00	-
AHSC13	Business Economics and Financial Analysis	1.10	1.10	-	-	-	-	-	1.10	1.10	-	1.10	-	-	-	-
AAEC14	Aerospace Propulsion	1.10	1.00	-	1.10	-	-	-	-	-	-	-	-	1.20	1.00	-
AAEC15	Analysis of Aircraft Structures	1.40	1.50	-	0.90	-	-	-	-	-	-	-	-	1.20	2.90	-
AAEC16	High Speed Aerodynamics	1.80	1.80	1.80	1.90	1.20	-	-	-	-	1.60	-	1.50	1.80	-	1.50

AHSC15	Soft Skills and Interpersonal Communication	-	-	-	-	-	-	-	1.90	-	2.20	-	-	-	-	-
AAEC55	Project Work (Phase - II)	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Direct attainment value		1.8	1.7	1.9	1.8	1.8	2.3	2.3	2	2.4	2.2	2.4	1.8	1.8	2	1.8

Overall Attainment

S No.	Assessment Component (Direct + Indirect)	Program Outcomes												PSOs		
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1.	Direct Assessment (CIA + SEE + Course End Survey) (a)	1.8	1.7	1.9	1.8	1.8	2.3	2.3	2	2.4	2.2	2.4	1.8	1.8	2	1.8
2.	Student Program exit surveys (b)	2.3	2.3	2.3	2.3	2.2	2.3	2.3	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3
3.	Employer surveys (c)	2.4	2.4	2.3	2.4	2.4	2.4	2.4	2.4	2.3	2.4	2.4	2.5	2.3	2.5	2.3
4.	Alumni Survey (d)	2.5	2.4	2.3	2.5	2.5	2.3	2.5	2.5	2.3	2.5	2.4	2.3	2.5	2.4	2.3
Overall attainment = a*0.8 + b*0.1 + c*0.05 + d*0.05		1.9	1.8	2.0	1.9	1.9	2.3	2.3	2.1	2.4	2.2	2.4	1.9	1.9	2.1	1.9

Action taken to improve the attainment of POs and PSOs:

POs	Target Level	Attainment Level	Observations
PO 1: Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.			
PO 1	1.6	1.9	Target Achieved. Following courses were identified which didn't meet the attainment target AHSC02, AHSC03, ACSC01, AHSC05, ACSC02, AHSC07, AMEC01, AEEC01, AMEC03, AHSC08 AAEC01, AAEC02, AAEC04, AAEC06, AAEC07, AAEC08, AAEC09, AAEC10, AHSC13, AAEC14 AAEC15, AAEC17, AAEC23, AAEC27, AAEC35, AAEC36, AAEC52
Action:			
<ol style="list-style-type: none"> Additional theory classes and tutorials to be conducted for students to gain a better understanding of the concepts of science and engineering. Study materials and expert session to be conducted to gain the core and industry oriented engineering knowledge. 			

PO 2: Problem Analysis: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.			
PO 2	1.2	1.8	Target Achieved. Following courses were identified which didn't meet the attainment target AHSC05, ACSC02, AAEC02, AAEC06, AAEC07, AAEC08, AHSC13, AAEC14, AAEC27, AAEC23, AAEC36, AAEC35, AAEC52
Action:			
<ol style="list-style-type: none"> 1. More emphasize on tutorial classes for problem solving. 2. Additional lab sessions focusing on basic and complex problems will be conducted to enhance students' analytical skills in solving engineering problems. 3. Students are encouraged to participate in the Hackathon and other competitions held by Govt. and prestigious institute for developing an analytical mind and skills. 			
PO 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.			
PO 3	1.4	2.0	Target Achieved. Following courses were identified which didn't meet the attainment target ACSC01, ACSC02, AMEC01, AMEC03, AAEC02, AAEC04, AAEC08, AAEC09, AAEC35, AAEC36
Action:			
<ol style="list-style-type: none"> 1. Additional tutorial classes and lab session will be conducted to gain the knowledge for designing the system components 2. Multiple workshops will be conducted on design and development of UAVs for multidisciplinary applications 3. Students are encouraged to take part in design contests conducted by national and international agencies. 4. The Skill Bridge Program has created a platform for students to horn their Employability skills along with Aptitude through various activities. Skills covered under this program are <ul style="list-style-type: none"> • Basic 2D and 3D design (software used AutoCAD) • Aircraft structure design (software used CATIA) • Structural Analysis (software used ANSYS) • Mechanism Design (CATIA DMU) • Computational Fluid Analysis (CFD) (software used ANSYS FLUENT) 			
PO 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.			
PO 4	1.2	1.9	Target Achieved. Following courses were identified which didn't meet the attainment target AHSC05, ACSC02, AAEC07, AAEC08, AAEC14, AAEC15

Action:			
<ol style="list-style-type: none"> 1. Additional materials and tutorials are provided to understand the advanced level subjects. 2. Expert talk and Academic workshops will be conducted to improve the knowledge on experiments and analysis of results. 3. Students are encouraged to write a research article to improve their analyzing and data interpretation skills. 			
PO5: 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.			
PO 5	1.6	1.9	Target Achieved. Following courses were identified which didn't meet the attainment target ACSC01, ACSC02, AMEC03, AAEC04, AAEC08, AAEC09, AAEC16, AAEC23, AAEC25, AAEC42
Action:			
<ol style="list-style-type: none"> 1. Modern labs will be developed to learn/ demonstrate the use of Modern software tools like MATLAB (for analysis); Auto CAD (for basic modeling); ABAQUS (for FEM), Aircraft structure design (software used CATIA), Mechanism Design (CATIA DMU), Computational Fluid Analysis (CFD) (software used ANSYS FLUENT). 2. Students will be taught with modern modes and methods of teaching like using LCD Projectors and with interactive and digital boards and learning in smart class rooms equipped with real time lecture webcast/broadcast facilities. 			
PO 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.			
PO 6	1.3	2.3	Target Achieved. Following courses were identified which didn't meet the attainment target ACSC02, AMEC01
Action:			
<ol style="list-style-type: none"> 1. Student industry visits will be arranged to understand the safety concern, social aspects and expand their practical knowledge. 			
PO 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.			
PO 7	1.4	2.3	Target Achieved. Following courses were identified which didn't meet the attainment target ACSC02, AAEC10
Action:			
<ol style="list-style-type: none"> 1. Students are encouraged to engage in projects relating to energy consumption and the use of renewable energy resources that address global and environmental issues. 			
PO 8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.			
PO 8	1.4	2.1	Target Achieved. Following courses were identified which didn't meet the attainment target ACSC02, AHSC13

Action:			
<ol style="list-style-type: none"> 1. Guest lecture were arranged to motive the students and made aware about the demands of engineering profession, duties towards society & fellow human beings and importance of honesty and ethics. 2. Students are encouraged to engage in business economics and finance session for promote commitment to ethical principles. 			
PO 9: Individual and Team Work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.			
PO 9	1.6	2.4	Target Achieved. Following courses were identified which didn't meet the attainment target ACSC02, AMEC03, AHSC13
Action:			
<ol style="list-style-type: none"> 1. Institute has initiated Program which provides a platform to work in individual as well as a group in the fields of Engineering. It helps the students to groom the skills like leadership or as an effective team member. 2. Various clubs are available in institute; students are encouraged to take part of it to handle multi-tasking roles which help them to excel in their professional career. 3. The laboratory work of the students is conducted by framing student groups so that students learn to work in a team environment. 4. The final year project work is conducted by first making student groups in which students with different abilities are included (decided on the basis of CGPA). These groups are allotted to faculty members as per the area-preference given by the students. This helps students to learn to work with team members of different capabilities and background. 			
PO 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.			
PO 10	1.5	2.2	Target Achieved. Following courses were identified which didn't meet the attainment target AHSC01, ACSC01, ACSC02, AMEC03, AAEC25
Action:			
<ol style="list-style-type: none"> 1. Students are encouraged to give presentation on specific topic in class to progress their communication skills 2. Soft skills training is provided to students to enhance their communication abilities and technical presentation skills through group discussions, presentations, and exposure to new learning outcomes 3. Alternative assessment tools, such as tech talks and concept video presentations, help students overcome stage fear and improve their presentation skills. 			
PO 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.			
PO 11	1.6	2.4	Target Achieved. Following course were identified which didn't meet the attainment target AHSC13

Action:

1. Project Expo and METE Expo are conducted for students from the first year itself along with their seniors to understand the concept of product development as well finance management for completion of such small projects.
2. Students are encouraged to take up full semester internship program in various organizations to take up industry-oriented project works.

PO 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.

PO 12	1.3	1.9	Target Achieved. Following courses were identified which didn't meet the attainment target ACSC01, ACSC02, AMEC03, AAEC08, AAEC09, AAEC10
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Action:

1. Students are made to recognize the importance of lifelong learning through pep/ motivational talks. Using ICT facilities, such as PPTs, live demonstration of topics imparted using video lecture and real time webcast and lecture contents including new technological developmental tools and knowledge of new products, gives students and lifelong knowledge to be further improved upon.

PSO 1: Build the prototype of UAVs and aero-foil models for testing by using low speed wind tunnel towards research in the area of experimental aerodynamics.

PSO 1	1.5	1.9	Target Achieved. Following courses were identified which didn't meet the attainment target ACSC01, ACSC02, AAEC06, AAEC07, AAEC08, AAEC14, AAEC15, AAEC27, AAEC25, AAEC36, AAEC42
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Action:

1. Students are motivated to learn programming languages and attend the workshops for applying them in aerospace industry.
2. Frequently workshops will be held on the design and development of UAVs for various multidisciplinary applications.
3. Students are encouraged to undertake projects that utilize technical resources such as software and existing experimental facilities to address technical challenges.

PSO 2: Focus on formulation and evaluation of aircraft elastic bodies for characterization of aero elastic phenomena.

PSO 2	1.2	2.1	Target Achieved. Following courses were identified which didn't meet the attainment target AAEC10, AAEC14, AAEC27, AAEC35
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Action :

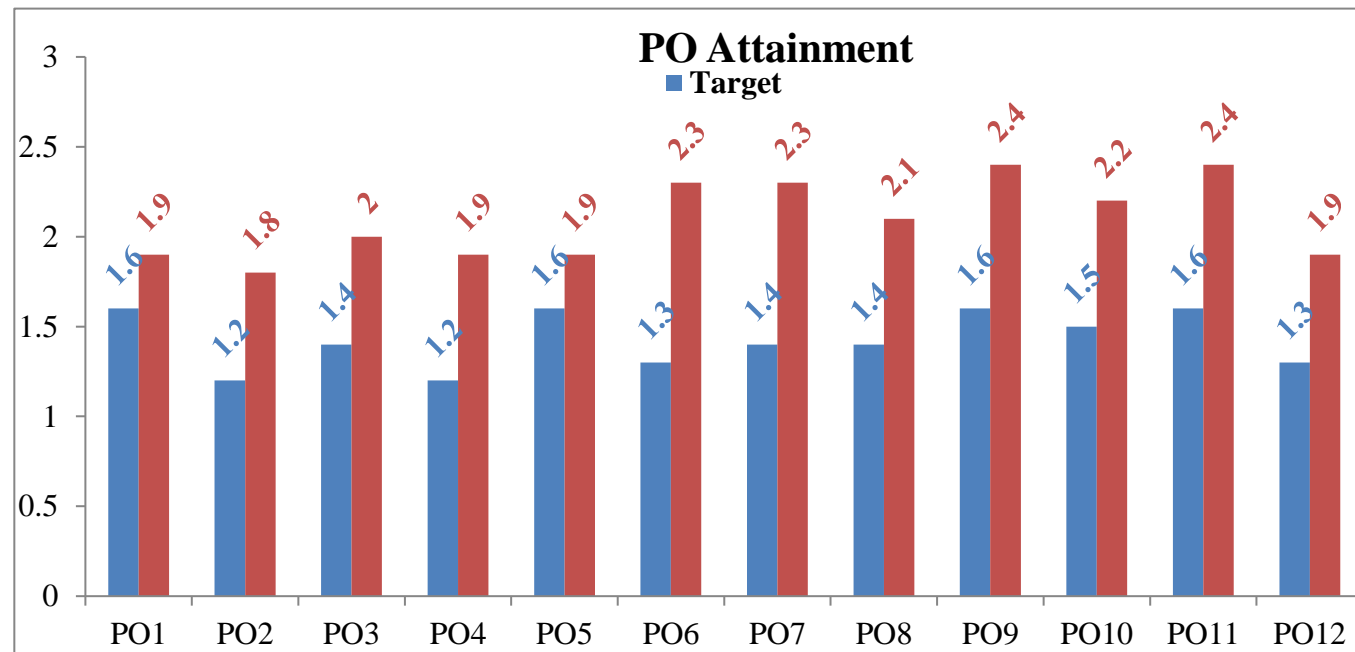
1. Students are encouraged to participate in the in workshops or seminars related to aircraft production technology, propulsion systems, and structural dynamics.

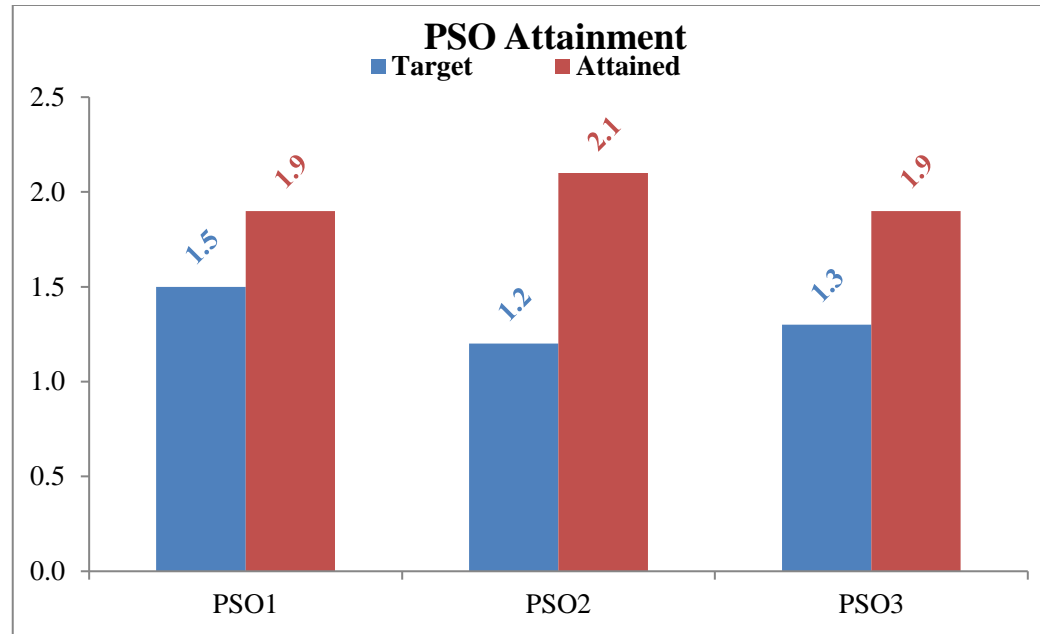
PSO 3: Make use of multi physics, computational fluid dynamics and flight simulation tools for building career paths towards innovative startups, employability and higher studies.

PSO 3	1.3	1.9	Target Achieved. Following courses were identified which didn't meet the attainment target AHSC03, ACSC01, AHSC05, AMEC01, AMEC03, AAEC02, AAEC04, AAEC09, AAEC23, AAEC42, AAEC52
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Action:

1. Extra study materials and remedial classes are conducted for the slow performance students in the I, II year.
2. Students are encouraged to take up certified courses on computational tools from various digital platforms.
3. Career readiness program and corporate lectures are arranged to meet required expertise in field of engineering.





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