



INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad - 500 043

Department of Civil Engineering

Attainment of Program Outcomes (POs) and Program Specific Outcomes (PSOs) of 2016 - 2020 batch (IARE - R16)

Course Code	Subject Code	Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C101	AHS001	English For Communication	-	-	-	-	-	-	-	-	-	2.40	-	-	-	-	-
C102	AHS002	Linear Algebra And Ordinary Differential Equations	2.00	1.20	-	-	-	-	-	-	-	-	-	-	-	-	-
C103	AHS005	Engineering Chemistry	1.60	1.70	-	-	-	-	2.10	-	-	-	-	-	-	-	-
C104	AHS007	Applied Physics	1.70	1.40	-	2.30	-	-	-	-	-	-	-	-	1.80	-	-
C105	AME001	Engineering Drawing	1.70	1.70	-	-	1.70	-	-	-	1.70	1.70	-	-	1.70	-	-
C106	AHS101	Communication Skills Laboratory	-	-	-	-	-	-	-	-	1.60	1.60	-	-	-	-	-
C107	AHS103	Engineering Chemistry Laboratory	3.00	3.00	-	-	-	-	3.00	-	-	-	-	-	-	-	-
C108	ACS113	IT Workshop	3.00	3.00	-	-	3.00	-	-	-	-	-	-	3.00	-	-	3.00
C109	AME101	Basic Workshop	3.00	-	3.00	-	3.00	-	-	-	-	-	3.00	-	-	-	-
C110	AME002	Engineering Mechanics	0.90	0.90	0.90	-	-	-	-	-	-	-	-	-	0.90	-	-
C111	AHS003	Computational Mathematics And Integral Calculus	2.00	1.90	-	-	-	-	-	-	-	-	-	-	-	-	-
C112	AHS008	Modern Physics	2.30	2.50	-	2.90	-	-	-	-	-	-	-	-	1.80	-	-
C113	AHS009	Environmental Studies	1.10	-	-	0.70	-	-	1.10	-	-	-	-	-	-	-	-
C114	ACS001	Computer Programming	1.20	-	1.20	-	1.20	-	-	-	-	1.20	-	-	-	-	1.20

C115	AHS102	Computational Mathematics Laboratory	3.00	3.00	-	3.00	-	-	-	-	-	-	-	-	3.00	-	-
C116	AHS105	Engineering Physics Laboratory	3.00	3.00	-	3.00	-	-	-	-	-	-	-	-	3.00	-	-
C117	ACS101	Computer Programming Laboratory	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	-	1.60	1.60	1.60	-	-	-
C118	AME102	Computer Aided Engineering Drawing Practice	1.60	-	1.60	-	1.60	-	-	-	1.60	1.60	-	-	1.60	-	-
C201	AHS010	Probability And Statistics	2.40	2.00	-	2.60	-	-	-	-	-	-	-	-	-	-	-
C202	ACE001	Strength Of Materials-I	2.00	2.20	2.90	-	2.10	-	2.70	-	-	-	-	2.10	1.90	-	-
C203	ACE002	Surveying	2.60	2.80	-	-	2.90	-	-	-	-	-	-	-	2.70	-	-
C204	ACE003	Engineering Geology	2.00	-	1.80	-	-	-	1.70	-	-	-	-	-	1.70	1.80	-
C205	AEE018	Basic Electrical and Electronics Engineering	1.80	1.80	-	-	-	-	-	-	-	-	-	-	1.40	-	-
C206	ACE101	Surveying Laboratory	3.00	3.00	-	-	3.00	-	-	-	3.00	-	-	-	3.00	-	-
C207	ACE102	Computer Aided Drafting of Buildings	3.00	3.00	-	-	3.00	-	-	-	-	-	-	-	-	-	3.00
C208	ACE103	Engineering Geology Laboratory	3.00	3.00	-	3.00	3.00	-	-	-	-	-	-	-	-	3.00	-
C209	AHS011	Mathematical Transform Techniques	1.60	1.40	-	1.30	-	-	-	-	-	-	-	-	1.50	-	-
C210	ACE004	Strength of Materials-II	2.20	2.20	-	2.20	2.30	-	-	-	-	-	-	-	2.30	-	-
C211	ACE005	Fluid Mechanics	2.30	2.20	2.30	2.30	-	-	-	-	-	2.40	-	-	2.10	-	-
C212	ACE006	Geotechnical Engineering	1.80	1.90	1.70	2.10	2.10	-	-	-	-	-	-	-	1.50	1.20	-
C213	ACE007	Building Materials Construction and Planning	1.70	1.40	2.70	-	-	-	-	-	-	-	-	-	1.90	-	-
C214	ACE104	Strength Of Materials Laboratory	3.00	3.00	-	3.00	3.00	-	-	-	-	-	-	-	3.00	-	-
C215	ACE105	Geotechnical Engineering Laboratory	3.00	3.00	3.00	3.00	-	3.00	-	-	-	-	-	-	3.00	3.00	-
C216	ACE106	Advanced Surveying Laboratory	3.00	3.00	-	-	3.00	-	-	-	3.00	-	-	-	3.00	-	-
C301	ACE008	Structural Analysis	1.10	0.90	0.90	-	-	-	-	-	-	-	-	0.50	1.00	-	-
C302	ACE009	Reinforced Concrete Structures Design and Drawing	2.30	2.20	2.20	-	-	-	-	-	-	-	-	-	2.30	-	-

C303	ACE010	Concrete Technology	2.90	2.90	2.90	-	2.80	-	2.90	-	-	-	-	-	2.90	2.90	-
C304	ACE011	Hydraulics and Hydraulic Machinery	2.30	2.30	-	2.30	-	-	-	-	-	2.10	-	-	2.20	-	-
C305	AHS015	Business Economics and Financial Analysis	1.70	1.50	-	-	-	-	-	1.10	1.20	-	1.40	-	-	-	1.20
C306	ACE533	Disaster Management and Mitigation	2.80	-	-	-	-	2.80	2.70	-	-	-	-	-	-	-	-
C307	ACE107	Fluid Mechanics and Hydraulic Machinery Laboratory	3.00	-	3.00	-	3.00	-	-	-	-	-	-	-	-	-	3.00
C308	ACE108	Concrete Technology Laboratory	3.00	-	3.00	-	3.00	-	3.00	-	-	-	-	-	3.00	-	-
C309	ACE111	Building Information Modeling Laboratory	3.00	-	3.00	-	3.00	-	-	-	3.00	-	-	3.00	3.00	3.00	3.00
C310	ACE012	Design Of Steel Structures and Drawing	2.90	2.90	2.90	2.90	-	-	-	-	-	-	-	-	2.90	-	-
C311	ACE013	Transportation Engineering	2.80	-	2.90	2.80	2.90	-	-	-	-	-	-	-	2.90	2.70	-
C312	ACE014	Water Resources Engineering	1.20	1.20	1.30	1.30	-	-	1.20	-	-	-	-	-	1.30	1.30	-
C313	ACE526	Industrial Waste Water Treatment	2.90	-	-	2.90	-	2.90	2.90	-	-	-	-	-	-	2.90	-
C314	AME551	Elements Of Mechanical Engineering	1.20	1.20	1.20	1.20	1.20	-	1.20	-	-	-	1.30	-	1.20	-	-
C315	AHS108	Technical Writing and Content Development	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
C316	ACE201	Ideation And Product Development	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50
C317	ACE109	Advanced Material Testing Laboratory	3.00	-	3.00	-	3.00	-	3.00	-	-	-	-	-	3.00	-	-
C318	ACE110	Transportation Materials Laboratory	3.00	-	3.00	3.00	3.00	-	3.00	-	-	-	-	-	3.00	3.00	-
C401	ACE015	Environmental Engineering	2.90	2.90	2.90	2.90	-	-	-	-	-	-	-	-	2.90	2.90	-
C402	ACE016	Advanced Structural Analysis and Design	2.90	2.90	2.90	2.90	-	-	-	-	-	-	-	-	2.90	-	-
C403	ACE017	Estimation And Costing	2.90	2.90	-	-	2.90	2.90	-	-	-	-	-	2.90	2.90	-	2.90
C404	ACE509	Ground Improvement Techniques	2.80	2.80	-	2.80	-	-	-	-	-	-	-	-	2.80	2.80	-
C405	AEE551	Energy From Waste	1.70	-	1.80	-	-	1.90	1.90	-	-	-	-	2.10	-	1.80	-
C406	ACE112	Environmental Engineering Laboratory	3.00	-	3.00	-	-	3.00	3.00	-	-	-	-	-	-	3.00	-
C407	ACE113	Advanced Structural Design Laboratory	3.00	3.00	3.00	-	3.00	-	-	-	-	-	-	-	3.00	-	-

C408	ACE114	Project Planning and Development Laboratory	3.00	-	-	-	3.00	-	-	-	-	3.00	3.00	-	-	-	3.00
C409	ACE018	Foundation Engineering	1.90	0.50	0.50	1.60	1.90	-	-	-	-	-	-	-	1.40	-	-
C410	AHS016	Industrial Management and Psychology	-	-	-	-	-	-	2.90	2.90	2.90	-	2.90	-	-	-	-
C411	ACE505	Rehabilitation and Retrofitting Of Structures	2.60	2.40	2.70	2.80	2.90	-	-	-	-	-	-	2.90	2.60	2.80	-
C412	ACE401	Comprehensive Examination	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	-	2.00	2.00	2.00	2.00	2.00
C413	ACE302	Project Work	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
C414	ACE303	FULL SEMESTER INTERNSHIP - RESEARCH PROJECT WORK	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			2.4	2.3	2.4	2.5	2.6	2.7	2.5	2.5	2.5	2.3	2.5	2.5	2.4	2.6	2.7

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)	2.4	2.3	2.4	2.5	2.6	2.7	2.5	2.5	2.5	2.3	2.5	2.5	2.4	2.6	2.7
2.	Student Program exit surveys (b)	2.2	2.2	2.3	2.2	2.3	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.3
3.	Employer surveys (c)	2.4	2.4	2.4	2.2	2.4	2.1	1.9	1.9	2	2.6	1.9	2.5	2.4	2.4	2.4
4.	Alumni Survey (d)	2.4	2.4	2.4	2.2	2.4	2.1	1.9	1.9	2	2.6	1.9	2.5	2.4	2.4	2.4
Overall attainment = a*0.8 + b*0.1 + c*0.05 + d*0.05		2.4	2.3	2.4	2.5	2.6	2.6	2.4	2.4	2.4	2.3	2.4	2.5	2.4	2.5	2.6

Action taken to improve the attainment of POs and PSOs:

POs	Target Level	Attainment Level	Observations
PO1: Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.			
PO1	1.9	2.4	Target Achieved. Following courses were identified which didn't meet the attainment target AHS005, AHS007, AME001, AME002, AHS009, ACS001, ACS101, AME102, AEE018, AHS011, ACE006,
Action:			
<ol style="list-style-type: none"> 1. Additional tutorial classes were conducted to the students to enhance the skills in mathematical fundamentals. 2. Tutorial classes are conducted to the students on basics of engineering mechanics, strength of materials for understanding complex civil engineering problems. 			
PO2: Problem Analysis: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering			
PO 2	1.4	2.3	Target Achieved. Following courses were identified which didn't meet the attainment target AHS002, AME002, ACS001, ACE008, ACE014, AME551, ACE018
Action:			
<ol style="list-style-type: none"> 1. Additional focus is given on problem solving topics for analyzing complex engineering problems in the tutorial classes. 2. Students are encouraged for writing the assignments on various concepts for better understanding. 			
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.			
PO 3	1.4	2.4	Target Achieved. Following courses were identified which didn't meet the attainment target AME002, ACS001, ACE008, ACE014, AME551, ACE018
Action:			
<ol style="list-style-type: none"> 1. Interactive-sessions were organized to students with experts to improve skills in current and upcoming technologies. 2. Societal and environmental design problems were given as self-study to students in open elective courses. 			

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	1.4	2.5	Target Achieved. Following courses were identified which didn't meet the attainment target AHS009, AHS011, ACE014, AME551.
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Action:

1. Students were encouraged on designing of structural elements with modern approach.
2. Research based Courses will be included, syllabi to be updated to include and inculcate the analysis, research 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	1.7	2.6	Target Achieved. Following courses were identified which didn't meet the attainment target ACS001, ACS101, AME102, AME551.
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Action:

1. Students were motivated to use latest software for modelling and designing of structures.
2. Workshops were conducted on drafting tools, structural designs problems and analysis.

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	1.5	2.6	All courses target achieved.
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Action:

1. Awareness program on clean and renewable energy was organized to inculcate a strong sense of responsibility among the budding student engineers.
2. Students will be encouraged to participate in social clubs like sports club, cultural club.

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	1.7	2.4	Target Achieved. Following courses were identified which didn't meet the attainment target AHS009, ACS101, ACE014, AME551.
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Action:

1. Real time waste management systems were presented to encourage sense of responsibility among the students and also to promote sustainable environment.
2. Proper guidance was given to the students to utilize low carbon cement-based materials for promoting sustainability.

PO 8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO 8	1.7	2.4	Target Achieved. Following courses were identified which didn't meet the attainment target ACS101, AHS015.
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Action:

1. Guest lectures were arranged on topics related to professional ethics / value-based education.
2. Students were encouraged to get their major project and internship reports for plagiarism check to ensure proper practice of professional ethics.

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	1.5	2.4	Target Achieved. Following courses were identified which didn't meet the attainment target AHS015.
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Action:

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. There are a number of societies and clubs where the students learn to work both as individuals and in a team work environment.
2. The laboratory work of the students is conducted by framing student groups so that students learn to work in a team environment.

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	1.8	2.3	Target Achieved. Following courses were identified which didn't meet the attainment target AHS001, AME102, AAE106, AAE008, AAE009AAE013, AAE015, AAE017.
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Action:

1. Students were motivated to participate in various club activities where they will learn to function effectively both as individuals and as team members in a group.
2. Students were encouraged to participate in class room presentations and national/international conferences/seminars/symposia/ hackathon / ideathon.

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	1.5	2.4	Target Achieved. Following courses were identified which didn't meet the attainment target AHS015, AME551.
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Action:

1. Students were encouraged to do multidisciplinary project involving allied departments.
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	1.5	2.5	Target Achieved. Following courses were identified which didn't meet the attainment target ACE008.
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Action:

1. Students were motivated to enroll NPTEL certification courses on coding such as python, and programming courses which adds benefit for their future learning.
2. Highly motivated students are encouraged to pursue higher studies on specialized areas of civil engineering in premier institutions.

PSO 1 Design and Supervise Sub-Structures and Super Structures for Residential and Public Buildings, Industrial Structures, Irrigation Structures, Power Houses, Highways, Railways, Airways, Docs and Harbors.

PSO 1	1.2	2.4	Target Achieved. Following courses were identified which didn't meet the attainment target AME002, ACE008.
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Action:

1. Workshops are organized on modern software to improve skill-set of students in designing of various structures.
2. Students are motivated to take up the real-life problems during their project work so that they can design, analyze and find solution which gives exposure to latest technologies.
3. Students were encouraged to take up MOOC courses as part of co-curricular activities.

PSO 2: Focus on Improving Performance of Structures with reference to Safety, Serviceability and Sustainable Green Building Technology.

PSO 2	1.7	2.5	Target Achieved. Following courses were identified which didn't meet the attainment target ACE006, ACE014.
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Action:

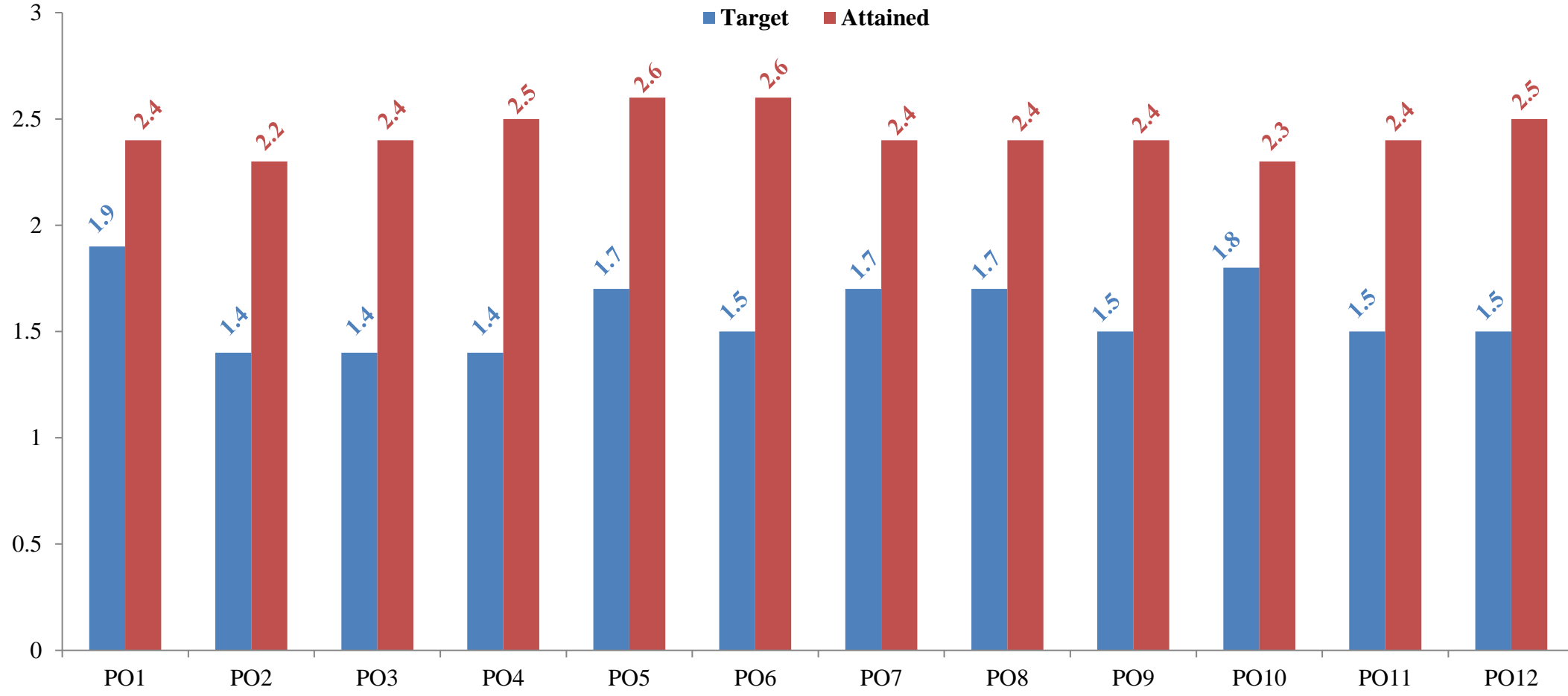
1. Expert lectures were arranged on safety, serviceability, and importance of modern structural engineering concepts.
2. Students were encouraged to participate in industry-related projects in order to have a better understanding of advanced industrial technologies.

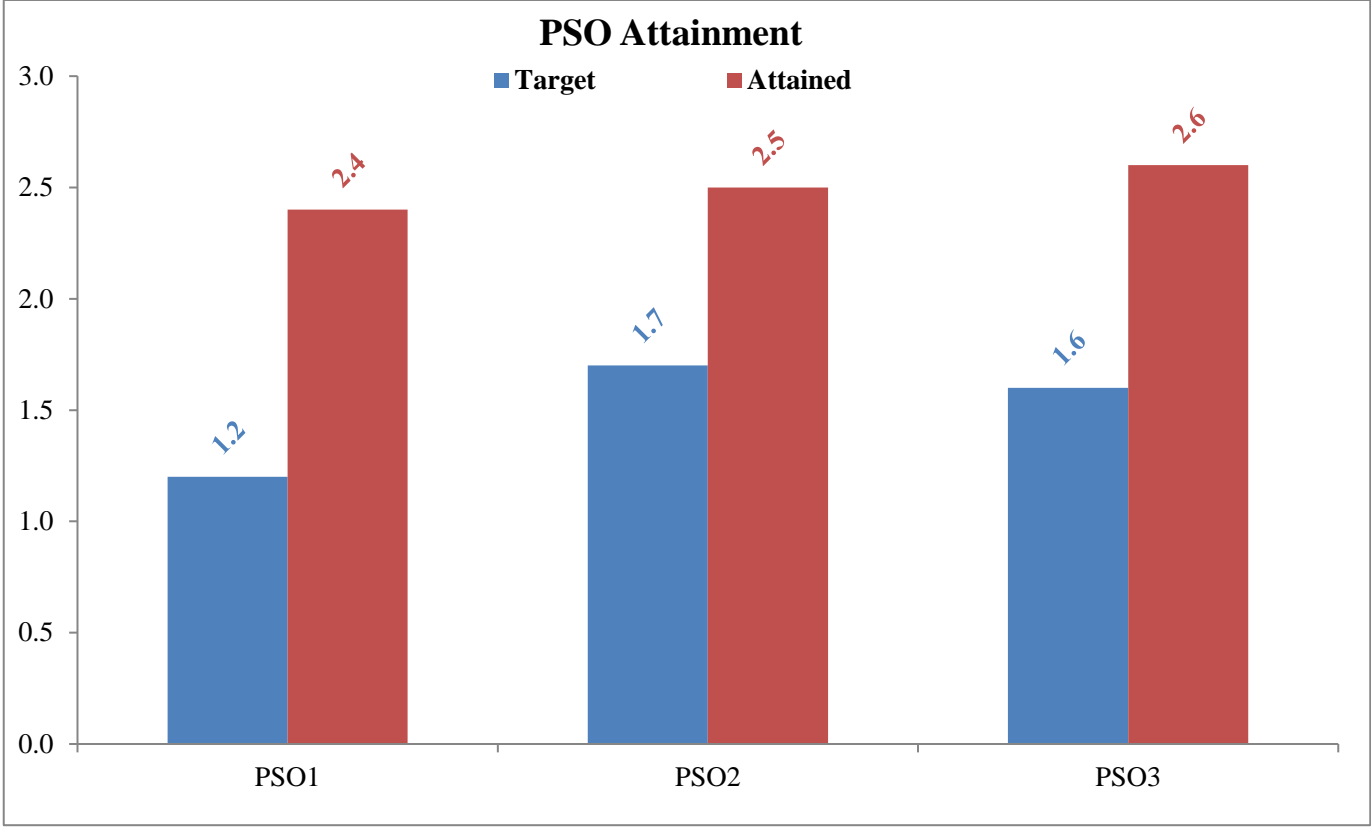
PSO 3: Make use of Advanced Structural Analysis and Project Management Software for creating Modern Avenues to succeed as an Entrepreneur, Pursue Higher Studies and Career Paths.

PSO 3	1.6	2.6	Target Achieved. Following courses were identified which didn't meet the attainment target ACS001.
Action: <ol style="list-style-type: none">1. Hands on workshop were conducted from industry experts on latest technologies and software implementations for getting real time exposure.2. Short term training program were conducted on program specific courses.			

PO Attainment

■ Target ■ Attained





HOD, CE