INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)
Dundigal, Hyderabad -500 043

CIVIL ENGINEERING

COURSE DESCRIPTOR

Course Title	**TECHNICAL WRITING AND CONTENT DEVELOPMENT**				
Course Code	AHS108				
Programme	B. Tech				
Semester	VI	CE			
Course Type	Skill				
Regulation	IARE - R16				
Course Structure	**Theory**			**Practical**	
	Lectures	**Tutorials**	**Credits**	**Laboratory**	**Credits**
	-	-	-	3	2
Chief Coordinator	Mr.S.Selvaparakash, Assistant Professor,CE				
Course Faculty	Mr.S.Selvaparakash, Assistant Professor,CE Mr.CH. .Venugopal Reddy, Assistant Professor,CE				

I. COURSE OVERVIEW:

The course addresses the key concepts related to research by practical understanding of the various methodological tools used in research related to any of the areas. It helps in learning solving the pragmatic issues involve in the research domain, helps to improve the proper research formulation and design the outcome as required. Improves the ability to develop technical writing. Overall helps to identify the process of designing a research based study from its inception to its report.

II. COURSE PRE-REQUISITES:

Level	Course Code	Semester	Prerequisites
UG	-	-	Basic Knowledge of word-processing applications

III. MARKS DISTRIBUTION:

Subject	SEE Examination	CIA Examination	Total Marks
Technical Writing And Content Development	70 Marks	30 Marks	100

IV. DELIVERY / INSTRUCTIONAL METHODOLOGIES:

✘	Chalk & Talk	✘	Quiz	✘	Assignments	✘	MOOCs
✔	LCD / PPT	✔	Seminars	✘	Mini Project	✔	Videos
✔	Technical Paper Writing						

V. EVALUATION METHODOLOGY:

Each laboratory will be evaluated for a total of 100 marks consisting of 30 marks for internal assessment and 70 marks for semester end lab examination. Out of 30 marks of internal assessment, continuous lab assessment will be done for 20 marks for the day to day performance and 10 marks for the final internal lab assessment.

Semester End Examination (SEE): The semester end lab examination for 70 marks shall be conducted by two examiners, one of them being Internal Examiner and the other being External Examiner, both nominated by the Principal from the panel of experts recommended by Chairman, BOS.

The emphasis on the experiments is broadly based on the following criteria:

20 %	To test the preparedness for the experiment.
20 %	To test the performance in the laboratory.
20 %	To test the calculations and graphs related to the concern experiment.
20 %	To test the results and the error analysis of the experiment.
20 %	To test the subject knowledge through viva – voce.

Continuous Internal Assessment (CIA):

CIA is conducted for a total of 30 marks (Table 1), with 20 marks for continuous lab assessment during day to day performance, 10 marks for final internal lab assessment.

Table 1: Assessment pattern for CIA

Component	Laboratory		Total Marks
Type of Assessment	Day to day performance	Final internal lab assessment	
CIA Marks	20	10	30

Continuous Internal Examination (CIE):

One CIE exams shall be conducted at the end of the 16th week of the semester. The CIE exam is conducted for 10 marks of 3 hours duration.

Preparation	Performance	Calculations and Graph	Results and Error Analysis	Viva	Total
2	2	2	2	2	10

VI. HOW PROGRAM OUTCOMES ARE ASSESSED:

Program Outcomes (POs)		Strength	Proficiency assessed by
PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.	3	SEE/CIE
PO 2	**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.	2	Seminars
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.	2	Technical Paper Writing
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.	2	Technical Paper Writing
PO 5	**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.	1	Seminars
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.	3	SEE/CIE

3 = High; 2 = Medium; 1 = Low

VII. HOW PROGRAM SPECIFIC OUTCOMES ARE ASSESSED:

Program Specific Outcomes (PSOs)		Strength	Proficiency assessed by
PSO 1	**Professional Skills:** The ability to understand, analyze and develop computer programs in the areas related to algorithms, system software, multimedia, web design, big data analytics, and networking for efficient design of computer-based systems of varying complexity.	2	Technical Paper Writing
PSO 2	**Software Engineering Practices:** The ability to apply standard practices and strategies in software service management using open-ended programming environments with agility to deliver a quality service for business success.	-	
PSO 3	**Successful Career and Entrepreneurship:** The ability to employ modern computer languages, environments, and platforms in creating innovative career paths to be an entrepreneur, and a zest for higher studies.	-	

3 = High; 2 = Medium; 1 = Low

VIII. COURSE OBJECTIVES (COs):

The course should enable the students to:	
I	Gain a practical understanding of the various methodological tools used for social scientific research.
II	Learn the ethical, political, and pragmatic issues involved in the research process.
III	Improve their ability to develop technical writing.
IV	Identify the overall process of designing a research study from its inception to its report.

IX. COURSE LEARNING OUTCOMES (CLOs):

COs	Course Outcome	CLOs	Course Learning Outcome
CO 1	Understand the concepts of formatting styles for different documentation procedures.	CLO 1	Learn the formatting styles using Latex for documentation.
		CLO 2	Understand the list of greek letters and math symbols used in representing the documentation.
CO 2	Understand the meaning of research in finding the gaps under working hypothesis.	CLO 3	Apply the knowledge of research in finding the gaps from literature.
		CLO 4	Explore the development of working hypothesis.
CO 3	Apply the techniques of data collection and	CLO 5	Perform the process of data collection and sample design.

COs	Course Outcome	CLOs	Course Learning Outcome
	sample design involved with different sampling techniques.	CLO 6	Understand the merits and demerits of sampling.
CO 4	Understand the process of testing involved with the survey results.	CLO 7	Test the experimental results involved in the survey.
CO 5	Explore the knowledge on multimedia tutorials and blogs.	CLO 8	Explore the knowledge on multimedia tutorials, wikis, blogs and websites.

3 = High; 2 = Medium; 1 = Low

X. COURSE LEARNING OUTCOMES (CLOs):

CLO Code	CLO's	At the end of the course, the student will have the ability to:	PO's Mapped	Strength of Mapping
AHS108.01	CLO 1	Learn the formatting styles using Latex for documentation.	PO 1	3
AHS108.02	CLO 2	Understand the list of greek letters and math symbols used in representing the documentation.	PO2,PO3	2
AHS108.03	CLO 3	Apply the knowledge of research in finding the gaps from literature.	PO 1	3
AHS108.04	CLO 4	Explore the development of working hypothesis.	PO 3	2
AHS108.05	CLO 5	Perform the process of data collection and sample design.	PO4	2
AHS108.06	CLO 6	Understand the merits and demerits of sampling.	PO 5	1
AHS108.07	CLO 7	Test the experimental results involved in the survey.	PO 12	3
AHS108.08	CLO 8	Explore the knowledge on multimedia tutorials, wikis, blogs and websites.	PO 3	2

XI. MAPPING COURSE OUTCOMES LEADING TO THE ACHIEVEMENT OF PROGRAM OUTCOMES

Course Outcomes (COs)	Program Outcomes (POs)					
	PO1	PO2	PO3	PO4	PO5	PO12
CO1	3					
CO2		2	3			
CO3			2			

Course Outcomes (COs)	Program Outcomes (POs)					
	PO1	PO2	PO3	PO4	PO5	PO12
CO4				2		
CO5					1	3

XII. MAPPING COURSE LEARNING OUTCOMES LEADING TO THE ACHIEVEMENT OF PROGRAM OUTCOMES AND PROGRAM SPECIFIC OUTCOMES:

Course Learning Outcomes (CLOs)	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3
CLO1	3														
CLO2		2	1												
CLO3			1												
CLO4					1								2		
CLO5															
CLO6												3			
CLO7															
CLO8					1							3			

3 = High; 2 = Medium; 1 = Low

XIII. ASSESSMENT METHODOLOGIES – DIRECT

CIE Exams	PO1,PO2, PO3,PO5, PO12,PS01	SEE Exams	PO1,PO2, PO3,PO5, PO12,PS01	Assignments	-	Seminars	PO2
Laboratory Practices	PO1,P02 PO3,PO5 PO12, PSO1	Student Viva	-	Mini Project	-	Certification	-
Term Paper	-						

XIV. ASSESSMENT METHODOLOGIES - INDIRECT

✔	Early Semester Feedback	✔	End Semester OBE Feedback
✘	Assessment of Mini Projects by Experts		

XV. SYLLABUS

Unit-I	LATEX FOR DOCUMENTATION
Formatting Styles, Inserting table, Bullets and Numbering, Changing Text Direction, Cell alignment,	

Footnote, Hyperlink, Symbols, Spell Check and Track Changes using LaTeX; Mathematical expressions, Subscripts and superscripts, brackets and parentheses, fractions and binomials, aligning equations, operators, spacing in math mode, integrals, sums and limits, display style in math mode, list of Greek letters and math symbols, mathematical fonts; Prepare class timetable and student marks list using LaTex

Unit-II	**RESEARCH FORMULATION AND DESIGN**

Motivation and objectives – Research methods vs. Methodology. Types of research – Descriptive vs. Analytical, Applied vs. Fundamental, Quantitative vs. Qualitative, Conceptual vs. Empirical, concept of applied and basic research process, criteria of good research. Defining and formulating the research problem, selecting the problem, necessity of defining the problem, importance of literature review in defining a problem, literature review-primary and secondary sources, reviews, monograph, patents, research databases, web as a source, searching the web, critical literature review, identifying gap areas from literature and research database, development of working hypothesis.

Unit-III	**DATA COLLECTION AND SAMPLING DESIGN**

Sources of Date: Primary Dada, Secondary Data; Procedure Questionnaire -Survey and Experiments - Design of survey and Experiments- Sampling Merits and Demirts - Control Observations - Procedures - Sampling Errors.

Unit-IV	**CONTENT DEVELOPMENT**

Document design and layout; Papers; Articles; E-book formats. Forums; Multimedia tutorials; Wikis; Blogs; Websites.

Unit-V	**PROOF READING PROCESS AND REPORT WRITING**

Definition, purpose, difference between content and copy, editing, competing priorities, elements of structure, style and appearance, evaluation, overall organizing, clarity of expression, grammatical accuracy, correctness of layout; Meaning of Interpretation, technique of Interpretation, precaution in Interpretation; Significance of report writing, different steps in writing report, layout of the research report, types of reports, oral presentation, mechanics of writing a research report, precautions for writing research reports, conclusions.

Text Books:

1. 1. Garg, B.L., Karadia, R., Agarwal, F. and Agarwal, "An introduction to Research Methodology", RBSA Publishers. U.K., 2002.
2. Kothari, C.R, "Research Methodology: Methods and Techniques". New Age International. 418p, 1990.
3. Stefan Kottwitz , " LATEX Beginner's Guide", Packt Publishing Limited, 2011.

Reference Books:

1. Meenakshi Raman, Sangeeta Sharma, "Technical Communication", Oxford Publishers, 1st Edition, 2004.
2. Sinha, S.C. and Dhiman, A.K., 2002. Research Methodology, Ess Publications.
3. Trochim, W.M.K., 2005. Research Methods: the concise knowledge base, Atomic Dog Publishing. 270p.

XVI. COURSE PLAN:

The course plan is meant as a guideline. Probably there may be changes.

Week No.	Topics to be covered	Course Learning Outcomes (CLOs)	Reference
1	Formatting Styles, Inserting table, Bullets and Numbering, Changing Text Direction, Cell alignment, Footnote, Hyperlink, Symbols, Spell Check and Track Changes using LaTeX; Mathematical expressions, Subscriptsand superscripts, brackets and parentheses.	CLO 1, CLO 2	T1
2	Fractions and binomials, aligning equations, operators, spacing in math mode, integrals, sums and limits, display style in math mode, list of Greek letters and math symbols, mathematical fonts; Prepare class timetable and student marks list using LaTex.	CLO 1, CLO 2	T1
3	Motivation and objectives – Research methods vs. Methodology. Types of research – Descriptive vs. Analytical, Applied vs. Fundamental, Quantitative vs. Qualitative, Conceptual vs. Empirical, concept of applied and basic research process, criteria of good research.	CLO 1, CLO 2, CLO 3, CLO 4	T2
4	Defining and formulating the research problem, selecting the problem, necessity of defining the problem, research databases, web as a source.	CLO 1, CLO 2, CLO 3, CLO 4	T2
5	Importance of literature review in defining a problem, literature review-primary and secondary sources, reviews, monograph, patents.	CLO 3, CLO 4, CLO 5	R1
6	Searching the web, critical literature review, identifying gap areas from literature and research database, development of working hypothesis.	CLO 3, CLO 4, CLO 5, CLO 6	R2
7	Sources of Date: Primary Dada, Secondary Data; Procedure Questionnaire -Survey and Experiments - Design of survey and Experiments- Sampling Merits and Demirts - Control Observations - Procedures - Sampling Errors.	CLO 3, CLO 4, CLO 5, CLO 6,CLO 7	T1
8	Document design and layout; Papers; Articles; E-book formats. Forums; Multimedia tutorials; Wikis; Blogs; Websites.	CLO 1, CLO 2, CLO 8	T1,T2
9	Definition, purpose, difference between content and copy, editing, competing priorities, elements	CLO 1, CLO 3, CLO 6, CLO 9	T1

Week No.	Topics to be covered	Course Learning Outcomes (CLOs)	Reference
	of structure, style and appearance, evaluation, overall organizing, clarity of expression, grammatical accuracy, correctness of layout.		
10	Meaningof Interpretation, techniqueof Interpretation, precaution in Interpretation; Significance of report writing, different steps in writing report, layout of the research report, types of reports, oral presentation, mechanics of writing a research report, precautions for writing research reports, conclusions.	CLO 8, CLO 9, CLO 10	T2

Prepared by:

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