RESEARCH METHODOLOGY
Semester I (Production Engineering) SUB CODE: MECC101
Teaching Scheme (Credits and Hours)

Teaching Scheme				Total Credit	Evaluation Scheme					Total Marks
L	T	P	Total		THEORY		IE	CIA	PR. / VIVO	
					Hrs	Marks	Marks	Marks	Marks	
Hrs	Hrs	Hrs	Hrs							
02	00	00	02	02	3	70	30	20	00	120

LEARNING OBJECTIVES:

The objective of this course is
- To learn various concepts related to research methodology

Lesson Planning

SR.NO	CHAPTER NO	DATE/WEEK	%WEITAGE
1	1 ,2,3,4	1st ,2^{ed} ,3^{ed}	20
2	5,6,7,8	4th ,5th ,6th	20
3	9,10,11	7th ,8th ,9th	20
4	12	19th ,11th ,12th	20
5	13,14	13th 14th 15th	20

Total hours (Theory): 30, Total hours (Practical):00, Total hours: 30

DETAILED SYLLABUS

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1	Introduction to the Research Methodology and research process at glance.
2	**Discussion on Illustrative Research Proposals**
3	**Quantitative Research Design**:Types of Research Designs and its applications
4	**Identifying the Research Problem**
5	**Specifying Data and Acquisition Methods**: Data types, Data source, Primary Data & Secondary Data, Comparison between various data actualization method.
6	**Quantities Research design**
7	**Measuring and Scaling: Fundamentals and Comparative Scaling**.: Commonly Used Scales in Business Research, Reliability and Validity of Scale
8	**Research Paper Discussion:** A Paper Contains Development and Validation of Scale
9	**Questionnaire Designing:** Steps in Designing Questionnaire, Pitfalls in Questionnaire Designing
10	**Developing and Using Online Questionnaire**
11	**Sampling Design and Procedure:** Sampling Method Procedure and Sample Size Decision
12	**Define Research Question and Framing and Testing of Hypotheses**: Developing the

	Hypothesis, Testing of Hypotheses: Type – I and II Errors, One Tailed and Two Tails Test of Significance. Parametric and Nonparametric Tests of Univariate and Bivariate Data(Nonparametric Tests: Kolmogorov Smirnov Test, Sign Test, Wilcoxon Matched Paris Test, Kolmogorov Smirnov Two Sample Test, Mann Whitey U Test)
13	**Test of Association and Research Report writing:** Regression (Introduction only), Preparing a Research Report and Communication the Research Result (Includes APA style of reporting the result referencing), Evaluation of Research Result
14	Statistical Package for Social Service(SPSS)

INSTRUCTIONAL METHOD AND PEDAGOGY (Continuous Internal Assessment (CIA) Scheme)
- At the start of course, the course delivery pattern, prerequisite of the subject will be discussed
- Lecture may be conducted with the aid of multi-media projector, black board, OHP etc. & equal weightage should be given to all units while conducting teaching & examination.
- Attendance is compulsory in lectures and Tutorial which carries 05 Marks.
- Viva Voce will be conducted at the end of the semester of 30 Marks.
- One internal exam of 30 marks is conducted as a part of Mid semester evaluation.

STUDENTS LEARNING OUTCOMES:

At the end of the course

   The students will gain an experience in defining research problem, thesis writing, applying quantitative methods,

REFERENCE
1. Research Methodology: Methods & Techniques by C R Kothari, 2e, Wishwa Publication, New Delhi
2. Research Methodology by D K Bhattacharyya, 1 e, Excel Books, New Delhi, 2003
3. How to Research by Loraine Blaxter, Christina Hughes and Molcolm Tight, Viva Books Pvt. Ltd., New Delhi
4. Basic Communication Skills for Technology – Andrea J Rutherford (Person)
5. Writing Your Thesis by Paul Oliver, Vistaar Pulication, New Delhi, 2006
6. The Research Student's Guide to Success by Pat Cryer, Viva Books Pvt Ltd., New Delhi
7. Technical Writing Process and Product – Shron J. Gerson (Person)
8. Business Communication, Lesiker and Petit: MCGraw Hill Publications, 1995
9. Business Correspondence and Report Writing – R.C. Sharma, Krishna Mohan (Tata McGraw)