



Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

Think Excellence. Live Excellence.

M. Tech in Mechanical Engineering with specialization in Industrial Engineering

Year 2nd

Sem 3rd

SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM UNIVERSITY EXAM	TWO TERM EXAM	TEACHER ASSESSMENT*	END SEM UNIVERSITY EXAM	TEACHER ASSESSMENT*				
MBAI202	ODS	RESEARCH METHODOLOGY	60	20	20	0	0	2	1	0	3

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P - Practical; C - Credit;

*Teacher Assessment shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 20 marks.

Course Educational Objectives (CEOs):

(A) The objective of the course is to equip the students with the concept and methods of Business Research. (B) To plan and design business research using scientific and statistical methods.

Course Outcomes (COs):

Students will be able to:

1. Demonstrate understanding of research methodology.
2. Apply the statistical concepts in business research.
3. Validate statistical statements relating to business research.


Syllabus


Unit - I

Business Research: An overview: Research process; Types of Research - Exploratory Research, Descriptive Research, Causal Research, Analytical Research; Problem formulation, Management problem v/s. Research problem; Approaches to Research; Importance of literature review; Business Research Design: Steps involved in a research design.

Unit - II

Sampling and Data Collection: Sampling and sampling distribution: Meaning, Steps in Sampling process; Types of Sampling - Probability and Non probability Sampling Techniques; Data collection: Primary and Secondary data - Sources - Advantages/Disadvantages; Data collection Methods: Observations, Survey, Interview and Questionnaire design, Qualitative Techniques of data collection.


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Unit - III

Measurement and Scaling Techniques: Nominal Scale, Ordinal Scale, Interval Scale, Ratio Scale, Criteria for good measurement; Attitude measurement – Likert's Scale, Semantic Differential Scale, Thurstone-equal appearing interval scale.

Unit - IV

Statistical Tools for Data Analysis: Measures of central tendency - Mean, Median, Mode, Quartiles, Deciles and Percentiles; Measures of Dispersion: Standard Deviation – Variance – Coefficient of Variance, Skewness; Correlation - Karl Pearson's coefficient of Correlation, Rank Correlation; Regression: Method of Least Squares; Formulation of hypothesis; Testing of hypothesis; Type I and Type II Errors.; Parametric tests: Z-Test, t-test, F-test, Analysis of Variance – One-Way and Two-way classification.; Non parametric tests - Chi-Square test.

Unit - V

Report writing: Reporting Research; Types of reports; Characteristics of a research report.

References

1. Malhotra Naresh K. (2008). *Marketing Research*. Pearson publishers, Latest Edition.
2. Zikmund, Babin, Carr, Griffin (2003). *Business Research Methods*. Cengage Learning, India, Latest Edition.
3. Cooper Donald R and Schindler Pamela S. (2006). *Business Research Methods*. McGraw-Hill Education, Latest Edition.
4. Anderson, Sweeney, William, Cam (2014). *Statistics for Business and Economics*. Cengage Learning, Latest Edition.
5. Krishnaswami O. R., Ranganatham M. (2011). *Methodology of Research in Social Sciences*. Himalaya Publishing House, Latest Edition.
6. Levin and Rubin (2008). *Statistics for Management*. Dorling Kindersley Pvt Ltd, Latest Edition.
7. Sekaran Uma (2003). *Research Methods for Business*. Wiley India, Latest Edition.
8. Gupta S. P. (2014). *Statistical Methods*. Sultan Chand and Sons, Latest Edition.
9. Aczel and Sounderpandian (2008). *Complete Business Statistics*. Tata-McGraw Hill, Latest Edition.
10. Kothari C. R. (2004). *Research Methodology*. Vishwa Prakashan, Latest Edition.


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			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM UNIVERSITY EXAM	TWO TERM EXAM	TEACHER ASSESSMENT*	END SEM UNIVERSITY EXAM	TEACHER ASSESSMENT*				
MBAI30C	ODS	Human Values & Professional Ethics	60	20	20	0	0	3	1	0	4

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P - Practical; C - Credit;

*Teacher Assessment shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 20 marks.

Course Educational Objectives (CEOs):

The objective of the course is to (A) disseminate the theory and practice of moral code of conduct and (B) familiarize the students with the concepts of "right" and "good" in individual, social and professional context

Course Outcomes (COs):

1. Help the learners to determine what action or life is best to do or live
2. Right conduct and good life
3. To equip students with understanding of the ethical philosophies, principles, models that directly and indirectly affect business.

Syllabus

Unit - I

Human Values: Values, Type of Values –competent, instrumental, terminal, extrinsic & intrinsic values; Hierarchy of values; Dysfunctionality of values. Basis of values: Philosophical, Psychological and socio-cultural.

Unit - II

Theories and Models of Value Development: Theories of Value Development -Psychoanalytic, Learning theory –social leaning, Models of Value Development -Value Analysis, Inquiry, Social Action.

UNIT - III

Professional Ethics: Meaning, Objectives, Sources of Ethics, Ethics V/s Morals and Values, Ethico-Moral Action, Theories of Ethics, Codes of Ethics.

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Unit - IV

Human Behaviour – Indian Thoughts: Guna Theory, Sanskara Theory, Karma Theory, Nishkama Karma Yoga and Professionalism.

Unit - V

Globalisation and Ethics: Impact of globalization on Indian corporate and social culture, Corporate Citizenship, Environmental Protection, Social Welfare and Community Development Activities.

References

1. Beteille Andre (1991), *Society and Politics in India*, Athlone Press, Latest edition
2. Chakraborty S. K. (1999), *Values and Ethics for Organizations*, oxford university press, Latest edition
3. Fernando, A.C. (2009), *Business Ethics - An Indian Perspective*, Pearson Education, India, Latest edition
4. Charles D. Ledermann (2012), *"Engineering Ethics"*, Pearson Education / Prentice Hall, New Jersey, (Indian Reprint), Latest edition
5. Boatwright John R (2012), *"Ethics and the Conduct of Business"*, Pearson Education, New Delhi, Latest edition
6. Crane, Andrew and Matten Dirk (2015), *Business ethics*, Oxford University Press Inc., New York., Latest edition
7. Murthy, C.S.V. (2016), *Business Ethics – Text and Cases*, Himalaya Publishing House Pvt. Ltd., Latest Edition
8. Naagrajan, R.R (2016), *Professional Ethics and Human Values*, New Age International Publications, Latest edition.


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			END SEM UNIVERSITY EXAM	TWO TERM EXAM	TEACHER ASSESSMENT*	END SEM UNIVERSITY EXAM	TEACHER ASSESSMENT*				
MTIE301	DS	DISSERTATION PHASE-I	0	0	0	400	200	0	0	26	13

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;

***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 20 marks.

Course Educational Objectives (CEOs):

(A) To develop the ability to solve a specific problem right from its identification and literature review till the successful solution of the same. (B) To train the students in preparing project reports and to face reviews and viva voce examination.

Course Outcomes (COs):

After completion of this course the students are expected to be able to

1. Identify real world problems of mechanical engineering and related systems.
2. Interpret the working of mechanical engineering systems.
3. Apply the principles of mechanical engineering in real world systems.
4. Criticize and experiment to arrive at solutions for real world mechanical engineering problems.
5. Analyse and evaluate to obtain solution for problems in mechanical engineering systems.
6. Develop a prototypes/models, experimental set-up and software systems necessary to meet the objectives.
7. Identify methods and materials to carry out experiments/develop code.
8. Reorganize the procedures with a concern for society, environment and ethics.
9. Analyze and discuss the results to draw valid conclusions.
10. Prepare a report as per recommended format and defend the work.

Syllabus/Guidelines

Dissertation Title

Dissertation will cover all the aspects (to the extent possible) of real life application of concepts studied under the program. . Alternately, a few research problems also may be identified for investigation. The dissertation shall be driven by realistic constraints like that related to economic, environmental, social, political, ethical, health & safety, manufacturability and sustainability. The outcomes to be attained by students by doing the project work shall be spelt

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out clearly. A project report is to be submitted on the topic which will be evaluated during the final review. Assessment procedure will be as spelt out in the regulations.

Guidelines of Selection/Allotment of Dissertation Title and Its Submission

- The selection of dissertation title should be non-trivial, analytical, practical/hardware implementation based, application oriented (relevant to the need of industries) and should involve the elementary research and/or development effort based on a specific theme.
- Students may be encouraged to undertake industry defined dissertation. For the industry defined dissertation there shall be one external supervisor of the industry and one internal supervisor of student's own department. It will be the sole responsibility of internal supervisor to define the research problem, scope, methodology and possible outcome from the dissertation in consultation with external supervisor.
- Supervisors for the dissertation can suggest the titles of dissertation considering their long term goal for research.
- Students can also discuss the titles of their choice or titles given from industries with the supervisors and if feasible and accepted by supervisors, can be included in the list of suggested titles.
- Final allotment of titles and supervisors will be published on notice board in consultation with Head of the Department.
- Requirement of change in the title of dissertation work should be applied to the Head of the Department with sufficient reasons for the change, before the exam of Dissertation Progress Review-I.
- After Dissertation Progress Review-I exam, change of the title will be permitted based on the comments of internal examiner. Such cases should apply for the change in titles and should get approval from the Head of the Department.

Dissertation Work in Collaboration with Industry

- It is preferable that students, with the approval of the Head of the Department, visit industry or a Research Laboratory for data collection, discussion of the dissertation, experimental work, survey, field studies, etc. during the project period. Projects sponsored by the Industries or R&D organizations will be encouraged and a close liaison with such organizations will be maintained.
- Students shall acknowledge the involvement and / or contribution of an Industries or R&D organizations for their dissertations.
- Satisfactory completion certificate issued by the Industry or R&D organization should be attached with the dissertation report.
- Internal supervisor, should monitor the progress of his/her students by remaining in contact with the students and external supervisors by emails, video conferencing and/or by making visits to the industries at least once in a month, depending on the need of particular project and as decided by concerned Head of the Department.

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Supervisors

- Students shall be assigned one or two supervisors(s) from the Institute.
- In case any supervisor leaves the Institute permanently or temporarily for a period exceeding one semester, the Head of the Department shall appoint new supervisor for the concern students. Any such arrangements made, should get approval from Head of the Institute.
- In case of interdisciplinary areas, at least one supervisor must belong to the discipline in which the student is registered.

Dissertation Evaluations

For continuous evaluation (*CE), a comprehensive internal assessment of the dissertation work should be made as per institute/university guidelines.

Dissertation and External Viva-Voce:

1. If any student has not done satisfactory work then internal review panel may not allow the student for external practical exam.
2. Review record for all the previous reviews along with remedial review (if applicable) should be maintained by the supervisor and marks will be allotted based on the review.
3. Students must submit a dissertation report on the project work carried out by him/her. The guidelines for preparation of dissertation report shall be followed by every student as per guidelines given by the department/institute/university.
4. Students must have to publish research papers (as per the university guidelines) related to their research work/dissertation. Also, students have to submit dissertation plagiarism report before its final submission.
5. The final dissertation report shall be submitted on or before the submission date mentioned in academic calendar.
6. For DISSERTATION, three hard bound copies (for supervisor, department library and student copy) along with a soft copy (in CD containing pdf of the report, certificate of paper published (if any) and detailed paper, with name, enrollment number, branch, year of admission of the student written on the CD) of the dissertation report shall be submitted to the Head of the Department before final examination of DISSERTATION on or before the date notified by the University. Reports must be certified by the supervisor, Head of the Department and the Head of the Institution.
7. Dissertation viva - voce will be held within the date fixed in the academic calendar and the grades will be finalized. External examiner will evaluate dissertation work as per schedule decided by department/institute/university.


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8. Details of the all internal review (Internal continuous evaluation) and external exams (External Practical) shall be adequately notified so as to enable interested faculty members and students to attend the same.

**The dissertation guidelines subjected to change, if institute/university change/revise it.*


Work to be completed by the students till the internal review and external viva (External Pr) exam should be as follows:

Title	Details	Work to be complete
DISSERTATION PROGRESS REVIEW	DISSERTATION PROGRESS REVIEW I for continuous evaluation (To be taken at the end of 2nd month of term)	Students should demonstrate in-depth knowledge and thoughtful application in stating an in-depth analysis of key theories supporting the study, problem definition must be complete. In this Presentation students have to teach the theory related to dissertation title with 10% of work completion.
	DISSERTATION PROGRESS REVIEW II for continuous evaluation (To be taken at the end of 3rd month of term)	Literature review and problem definition with objectives should be complete. Presentation of literature review should be in terms of table comparing different points. 20% of work should be complete
	DISSERTATION PROGRESS REVIEW III for continuous evaluation (To be taken at the end of term)	Demonstrate understanding, Application of relevant methodology, techniques and analysis with 40% of work completion.

Students must complete their research work upto detailed methodology of dissertation and expected outcomes in phase-I. Further, this research continues in phase-II.

**Student expected to publish at least one research paper during the term (preferably on literature review).*


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