COURSE CODE	CATEGORY	COURSE NAME	L	T	P	CREDITS	TEACHING & EVALUATION SCHEME				
							THEORY			PRACTICAL	
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
MTRM301	Common for all Engineering branches	Research Methodology in Engineering	3	1	0	4	60	20	20	0	0

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 10 marks.

Course Educational Objectives (CEOs):

1. The course has been developed with orientation towards research related activities and recognizing the ensuing knowledge as property.
2. To analyze and evaluate research works and to formulate a research problem to pursue research.
3. To develop skills related to professional communication and technical report writing.

Course Outcomes:

At the end of the course, students will demonstrate their ability to:

1. Understanding and formulation of research problem.
2. Apply quantitative and qualitative methods used in engineering research.
3. Analyze interpret and evaluate data that relate to engineering problems.
4. Develop skills related to professional communication, technical report writing and publishing papers.
5. Act professionally, autonomously, ethically and in teams to produce a professional product.

Syllabus

Unit-I

Introduction to Research Methodology: - An overview of Research process, Types of research; Approaches to research, Importance of criticism in Literature review, identifying research gaps; Formulation of research problem; Research design,

Data: Primary and secondary data-sources, advantages/disadvantages; Sampling and primary data collection, sampling size, random and structured sampling

Unit-II

Measurement and Scaling Techniques: - Types of scales, Criteria for good measurement, Attitude measurement - Likert's scale, Semantic differential scale, Thurstone-equal appearing interval scale.

Statistical Tools for Data Analysis: - Measure of central tendency, Measures of dispersion, Correlation and Regression, Formulation of hypothesis, Type I & Type II error, Parametric test, non-parametric test.

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Unit-III

Research Methods I - Use of computer software in research and understanding the limitations. Multi-attribute decision making methods, Data envelopment analysis, Grey relational analysis etc., Multidisciplinary research problems, Synthesis of disciplinary research findings; Reliability and sensitivity analysis.

Unit-IV

Research Methods II - Modeling and simulation of engineering problem; Mathematical modeling-formulation, calibration, validation, application; measurement design – validity, reliability, scaling and sources of error. Mathematical programming methods, Numerical analysis, Optimization techniques, Design of laboratory experiments and field tests.

Unit-V

Academic Writing Skills and Presentation - Layout of a Research paper, research report, Thesis structure, Impact factor of Journals, Ethical issues related to publishing, Plagiarism and Self-Plagiarism. Reference Management Software like Mendeley, Software for paper formatting like LaTeX/MS Office, Software for detection of Plagiarism. Guidelines on how to write research papers. Content of Poster presentation, Power point presentation, Oral presentation

Books:

Text Books -

1. C.R. Kothari, 2012. Research Methodology Methods and Techniques, 3/e, Vishwa Prakashan,
2. Montgomary, Douglas C., 2007. Design and Analysis of Experiments (Wiley India).
3. Chawla, D. and Sodhi, N., 2011. Research methodology: Concepts and cases. Vikas Publishing House.

Reference Books -

1. Donald H.McBurney, 2006. Research Methods, 5th Edition, Thomson Learning, ISBN: 81-315-0047.
2. Donald R. Cooper, Pamela S. Schindler, 2006. Business Research Methods, 8/e, Tata McGraw-Hill Co. Ltd.,
3. Timothy J. Ross 2002. Fuzzy Logic with Engg Applications, , Wiley Publications, 2nd Ed[d]
4. Thiel D.V. 2014. Research Methods for Engineering; Published by Cambridge University Press, UK
5. P.J. van Laarhoven & E.H. Aarts, Simulated Annealing: Theory and Applications (Mathematics and Its Applications).

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Master of Technology (Computer Science Engineering)

COURSE CODE	CATEGORY	COURSE NAME	L	T	P	CREDITS	TEACHING & EVALUATION SCHEME				
							THEORY		PRACTICAL		
							END SEM University Exam	Two Term Exam	Teachers Assessment *	END SEM University Exam	Teachers Assessment *
MBAI301C		**Human Values and Professional Ethics**	**4**	**-**	**-**	**4**	**60**	**20**	**20**	**-**	**-**

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

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

COURSE OUTCOMES

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 Value

1. Type of Values –competent
2. Instrumental, terminal
3. Extrinsic & intrinsic values; Hierarchy of values; Dysfunctionality of values
4. Basis of values: Philosophical, Psychological and socio-cultural

UNIT–II

Theories of Value Development

1. Psycho-analytic
2. Learning theory –social leaning
3. Models of Value Development

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4. Value Analysis
5. Inquiry
6. Social Action

UNIT–III
Professional Ethics

1. Meaning
2. Objectives
3. Sources of Ethics
4. Ethics V/s Morals and Values
5. Ethico-Moral Action
6. Theories of Ethics, Codes of Ethics

UNIT–IV
Human Behavior – Indian Thoughts

1. Guna Theory
2. Sanskara Theory
3. Karma Theory
4. Nishkama Karma Yoga and Professionalism

UNIT–V
Globalization and Ethics

1. Impact of globalization on Indian corporate and social culture
2. Corporate Citizenship
3. Environmental Protection
4. Social Welfare and Community Development Activities

SUGGESTED READINGS:

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

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8. Naagrajan, R.R (2016). **Professional Ethics and Human Values**. New Delhi: New Age International Publications.