Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

Shri Vaishnav Institute of Technology

Master of Technology in Civil (WRE, CTM, Transportation, Geotechnical)

SEMESTER I

COURSE CODE	Category	COURSE NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM	Teachers Assessment*				
MTMACE 101	BS	Advanced Mathematics (CE)	60	20	20	-	-	3	0	0	3

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

***Teacher Assessment** shall be based on the following components: Quiz/Assignment/Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Educational Objectives (CEOs):

To introduce the students to advanced mathematics.

Course Outcomes (COs):

After the successful completion of this course students will be able to:

A. understand the concept of vector space, subspace, basis, dimensions and their properties.
B. find solution/numerical solution of PDE.
C. explain fundamental principles of probability theory.
D. understand the concept of Markov process and Queuing theory.
E. analyze and solve linear programming models of real life situations.

Syllabus

UNIT – I
Linear Algebra
Vector Space, Subspace, Basis & dimensions, Change of basis, Linear transformation, Matrix representation of Linear transformation.
UNIT – II
Numerical Solution of Partial Differential Equations:

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MTMACE 101	BS	Advanced Mathematics (CE)	60	20	20	-	-	3	0	0	3

Classification of second order equations, Finite difference approximation to derivatives, Elliptic equations, Solution of Laplace's equation, Solution of Poisson's equations, Parabolic equations, Solutions of Heat equations, Hyperbolic equations.

UNIT – III
Probability & Statistics:
Probability, Compound probability, Discrete random variable, Binomial and Poisson distribution, Continuous random variable, Normal distribution, Sampling distribution, Theory of hypothesis.

UNIT – IV
Stochastic Process & Queuing Theory:
Introduction of random or Stochastic processes, Markov processes, Markov chain, Queuing theory: M/M/1: ∞/∞/FCFS, M/M/1: N/∞/FCFS.

UNIT – V
Linear programming:
Introduction Linear programming problem, Matrix form of LPP, Basic solutions and Basic feasible solution, Graphical solution, Simplex method, BIG-M (penalty method) &,Two Phase methods, Duality in LPP.

Texts:
1. Higher Engg. Mathematics: B. S. Grewal, Khanna Publishers, Delhi
2. Higher Engg. Mathematics: E. Kreyzig, John Wiley & Sons (Asia) Pvt. Ltd.
3. Operation Research: S. D. Sharma, Kedar Nath and Ram Nath, Delhi.
4. Probability, Random variables & Random processes: Schaum's outlines.
5. Stochastic processes: J. Medhi, New age international publishers.
6. Calculus of finite differences and Numerica Analysis: Gupta and Malik.
7. Operation Research by Phillips & Ravindran.
8. Operation Research by TAHA.
9. Probability, Statistics & Decision in Civil Engineering by Benjamin & Cornell.

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Shri Vaishnav School of Management

Choice Based Credit System (CBCS) in Light of NEP-2020
MBA – Hospital and Health Management - III SEMESTER (2021-2023)

MBAI301C ADVANCEDHUMAN VALUES AND PROFESSIONAL ETHICS

COURSE CODE	CATEGORY	COURSE NAME	THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
MBAI301C	AECC	Advanced Human Values and Professional Ethics	60	20	20	-	-	3	-	-	3

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical: **C** - Credit; **AECC**- Ability Enhancement Compulsory Course

*****Teacher Assessment** shall be based on following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Objective
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

Examination Scheme
The internal assessment of the students' performance will be done out of 40 Marks. The semester Examination will be worth 60 Marks. The question paper and semester exam will consist of two sections A and B. Section A will carry 36 Marks and consist of five questions, out of which student will be required to attempt any three questions. Section B will comprise of one or more cases / problems worth 24 marks.

Course Outcomes
1. Help the students to understand right conduct in life.
2. To equip students with understanding of the ethical philosophies, principles, models that directly and indirectly affect personal and professional life.

COURSE CONTENT

Unit I: Inculcating Values at Workplace
1. Values: Concept, Sources, Essence
2. Classification of Values.
3. Values in Indian Culture and Management: Four False Views, Value Tree
4. Eastern and Western Values; Values for Global Managers

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			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*	L	T	P	CREDITS
MBAI301C	AECC	Advanced Human Values and Professional Ethics	60	20	20	-	-	3	-	-	3

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Unit II: Professional Ethics
1. Ethics: Concept, Five P's of Ethical Power, Organisational Tools to Cultivate Ethics
2. Theories of Ethics: Teleological and Deontological
3. Benefits of Managing Ethics in an Organisation
4. Ethical Leadership

Unit III: Indian Ethos and Management Style
1. Indian Ethos and Workplace
2. Emerging Managerial Practices
3. Ethical Considerations in Decision Making and Indian Management Model
4. Core Strategies in Indian Wisdom and Ethical Constraints

Unit IV: Human Behavior – Indian Thoughts
1. Guna Theory
2. Sanskara Theory
3. Nishkama Karma
4. Yoga: Types, Gains; Stress and Yoga

Unit V: Spirituality and Corporate World
1. Spirituality: Concept, Paths to Spirituality
2. Instruments to achieve spirituality
3. Vedantic Approach to Spiritual and Ethical Development
4. Indian Spiritual Tradition.

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MBAI301C	AECC	Advanced Human Values and Professional Ethics	60	20	20	-	-	3	-	-	3

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical: **C** - Credit; **AECC-** Ability Enhancement Compulsory Course

***Teacher Assessment** shall be based on following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Suggested Readings
1. Kausahl, Shyam L. (2006). *Business Ethics – Concepts, Crisis and Solutions*. New Delhi: Deep and Deep Publications Pvt. Limited
2. Murthy, C.S.V. (2012). *Business Ethics –Text and Cases.* Himalaya Publishing House: Mumbai
3. Chakraborty, S. K. (1999). *Values and Ethics for Organizations*. Oxford university press
4. D.Senthil Kumar and A. SenthilRajan (2008). *Business Ethics and Values.* Himalaya Publishing House: Mumbai

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(2021-2023)

COURSE CODE	CATE-GORY	COURSE NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*	L	T	P	CREDITS
MTCE 2102	DCC	**Material Science and Concrete Technology**	60	20	20	30	20	2	1	2	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 10 marks.

Course Educational Objectives (CEOs):

To gain the discrete knowledge of concrete and its technology, subject involves theoretical and practical approaches which helps in exploring the different kinds of concrete & its properties, so that students can understand the nature and their significance in the field of transportation Engineering

Course Outcomes (COs):

1. To identify the functional role of ingredients of concrete and apply this knowledge to mix design philosophy
2. To acquire and apply fundamental knowledge in the fresh and hardened properties of concrete
3. To evaluate the effect of the environment on service life performance, properties and failure modes of structural concrete and demonstrate techniques of measuring the Non-Destructive Testing of concrete structure
4. To develop an awareness of the utilization of waste materials as novel innovative materials for use in concrete

Syllabus

UNIT I
08 Hrs.

Solid Materials: Structure of solid materials, atoms and bonds, inter-atomic and intermolecular bonds, crystals; Classification of solids; Mechanism of elastic and plastic actions in tension, compression, pure bending, and torsion; Elastic and inelastic properties of solids; Dislocations; Strain hardening; Triaxial stress.

UNIT II
08 Hrs.

Creep: Components of creep fracture; Analysis of creep curves; Method of predicting creep strength; Designing of creep
Fatigue: Fatigue loading, mechanism, factors affecting creep fatigue properties; S.N. diagrams
Hardness: Relation between hardness of different atomic structure measurement of hardness with other mechanical properties

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COURSE CODE	CATE-GORY	COURSE NAME	TEACHING &EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
MTCE 2102	DCC	Material Science and Concrete Technology	60	20	20	30	20	2	1	2	4

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit.
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UNIT III   09 Hrs.
Concrete Materials: Cement, manufacture, composition, structure, hydrated cement paste, heat of hydration, test for physical properties, different types of cements, and properties of aggregates
Fresh Concrete: Workability, factors affecting, testing, vibration analysis of fresh concrete
Strength of Concrete: Nature of strength, factors affecting, Autogenous heating, maturity of concrete, fatigue strength, impact strength.

UNIT IV   09 Hrs.
Elasticity Shrinkage and Creep: Modulus of elasticity; Dynamic modulus; Poisons ratio; Early volume changes; Swelling, shrinkage, creep factors influencing creep nature; Rheological models; Effects and design for creep.
Durability of Concrete: Permeability of concrete; Thermal properties of concrete; Resistance of concrete to fire; Resistance to abrasion, electrical properties, acoustic properties, chemical attack.

UNIT V   08 Hrs.
Testing of Hardened Concrete: Destructive and nondestructive testing of concrete; tests on composition of hardened concrete; variation of test results, accelerated testing of concrete
Mix Design: Basic consideration, Factors in choice of mix Proportion; Methods of mix design. I.B.C. Murdock; A.C.I. Method based on Road note No. 4

Text Books:
1. M.S. Shetty, Concrete Technology, S Chand publication, 2006
2. M. Neville and J.J. Brooks, Concrete Technology Prentice Hall, 2 edition, 17 June 2010
3. M.L Gambhir, Concrete Technology, Tata Mc Graw Hill Book Co. 2010

Reference Books:
1. R.K. Bansal, A Textbook of Strength of Materials, Laxmi Publications; Sixth edition, 2018
2. Pierre-Claude Aïtcin and Robert J Flatt, Science and Technology of Concrete Admixtures, Woodhead Publishing; 1 edition, 2015.

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			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
MTCE 2102	DCC	Material Science and Concrete Technology	60	20	20	30	20	2	1	2	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 10 marks.

List of Practical:

1. Basic test on cement and aggregate.
2. The assess quality of hardened concrete as per IS standard specification using rebound hammer
3. Non-destructive testing of concrete sample using Ultra Sonic Test

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			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
MTCE 2103	DCC	Soil Mechanics in Highway Engineering	60	20	20	30	20	2	0	2	3

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit.
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Course Educational Objectives (CEOs):
1. To gain experience regarding the determination of properties of different types of soils and their behavior.
2. To provide an opportunity to learn how to measure the shear strength of the soil and its importance
3. To impart knowledge about the lateral earth pressure

Course Outcomes (COs):
1. Determine the index properties of the soil
2. To understand classification of soil.
3. Identify the suitability of the soil for different foundations

Syllabus:

UNIT I   06 Hrs.
Classification of Soils: IS classifications; AASHO classifications; CAA classifications
CBR and Group Index: Laboratory and field determination of CBR value; Effect of soaking; Modulus of sub-grade reaction

UNIT II   06 Hrs.
Compaction: Theory of compaction, factors affecting compaction, effect of compaction on soil, properties, measurement of field compaction and field methods of compaction and control.

UNIT III   06 Hrs.
Bearing Capacity: Skemptons's analysis; Plate Load Test; Penetration Tests; Genera bearing capacity equation; Effect Of water table on bearing capacity
Stability of slopes: Types of slope failure; Bishop's slope stability analysis; Stability number

UNIT IV   06 Hrs.
Earth Pressures: Classical earth pressure theories; Effect of earth pressure on highway structures

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			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*	L	T	P	CREDITS
MTCE 2103	DCC	Soil Mechanics in Highway Engineering	60	20	20	30	20	2	0	2	3

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit.
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UNIT V
06 Hrs.

Soil Stabilization: Mechanics of stabilization; Mechanical, electrical, cement, lime, bitumen and chemical stabilization

Drainage: Vertical sand drains; Surface and sub-surface drainage for highways; Drainage for hill roads

Text Books:
1. Singh Alam, Soil Engineering in Theory and Practice, Asia Publishing House, 2012
2. Khanna S.K. and Justo, C.G., Highway Engineering, Khanna Publishers, Delhi, 2012
3. Punmia B.C., Soil Mechanics and Foundation Engineering, Laxmi Publications, 2016

Reference Books:
1. Venkat Ramaiah, Soil Mechanics, New Age International Pvt Ltd Publishers, 2015
2. IRC-49-1973, Recommended Practice for the Pulverization of B.C. for lime Stabilization
3. IRC-50-1973, Recommended Design for the use of Cement-Modified Soil in Road Constructions.
4. IRC-51-1992, Guideline for the use of Soil Lime Mixing Road Construction

List of Practicals:
1. Determination of the natural content of the given soil sample.
2. To determine the Density of soil by Core Cutter method
3. To determine the specific gravity of soil fraction passing 4.75 mm I.S sieve by density bottle.
4. To determine the particle size distribution of soil by Sieve Analysis.
5. To determine plastic limit, liquid limit, shrinkage limit of given soil sample.
6. To determine the shearing strength of the soil using the direct shear apparatus.
7. To find shear strength of a given soil specimen by Vane shear test.
8. To determine bearing capacity of soil using CBR Test

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			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*	L	T	P	CREDITS
MTCE 2104	DCC	Traffic Engineering	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 10 marks.

Course Educational Objectives (CEOs):
The aim of this course is to teach students about the traffic characteristic, traffic studies, highway capacity studies in traffic engineering

Course Outcomes (COs):
At the completion of the course the students will be able to
1. Understand the traffic characteristic.
2. Perceive the knowledge about traffic flow models.
3. Get knowledge about component parking and lighting.
4. Get knowledge about accident studies and highway capacity.

Syllabus:

UNIT I
08 Hrs.

Road User and Vehicle Characteristics: Road user; Vehicle Characteristics
Surveys: Different types of survey and studies; Speed and volume study; Parking survey, types of parking, parking meters, design of parking places Accident surveys.

UNIT II
08 Hrs.

Traffic Flow Models: Elements of traffic flow; Fundamental diagram of road traffic; Relationships between the variables; Greenshield's macroscopic stream model and microscopic flow models based on response; Stimulus approach, hydrodynamic analogy, queuing model.

UNIT III
08 Hrs.

Non-signalized Intersections: At grade and grade separated intersection; Channelization warrants; Weaving action at intersections; Delay models; Theoretical models for determining weaving capacity; Design of intersection

UNIT IV
08 Hrs.

Signalized Intersections: Different types of signals; Webster analysis; IRC method of signal design; Determination of effective green time; Optimum cycle time and timing diagram; Effect of left and right turning and heterogeneity; P.C.U. concepts; Ultimate capacity of whole intersection;

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			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
MTCE 2104	DCC	Traffic Engineering	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 10 marks.

Delay calculation and optimum cycle length; QUE lengths at the commencement of green period; Coordination of traffic signals

UNIT V **08 Hrs.**
Traffic Management: One way street system, two-way street system; Different traffic management methods; Flow operation; Closing side streets; Exclusive bus lanes; Intelligent vehicle system; Motor vehicle system

Text Books:
1. Louis J. Pignataro, Traffic Engineering: Theory and Practice, Prentice-Hall.
2. Kadiyali L.R., Traffic Engineering and Transport Planning, Khanna Publishers, 2010
3. IRC-65-1976, Recommended Practice for Traffic Rotaries.
4. IRC-SP-12-1973, Tentative Recommendation on the Provision of Parking space for urban area.

Reference Books:

1. D.R.Drew, Traffic Flow Theory, McGraw-Hill Book Company
2. Wohl & Martin, Traffic System Analysis for Engineering & Planners, McGraw-Hill Book Company

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