ME ESP SYLLABUS

1ST SEMESTER:-

Subject Code: IVC101	**Category**: Mandatory& Industry Value Added Course
Subject Name: MENTAL MATHS FOR PROFESSIONALS-I	**Semester** : 1st
L-T-P : 2-0-0 (Total Contact Hrs. 2)	**Credit:**0
Pre-Requisites: Basic & fundamental knowledge of mathematics up to class 10th standard, Logical & Analytical skill.	

Course Objective:

1. To learn aptitude and multiple tricky approaches.
2. To enhance the analytical skill and quick decision-making skill of the students. Good analytical skill and sound knowledge in analogies will also enhance student's interview facing skill.
3. To make them prepare for the various competitive exams and different placement aptitude test as well.
4. To enhance student's skill to appear in various aptitude test within limited time constrain.

Course Outcome:

1. Students will learn advance tricky approach for solving Quantitative Aptitude questions.
2. It will enhance students skill to appear in various aptitude test within limited time constrain.
3. This module will enhance students Analytical skill & will also improve quick decision making skill.
4. Students can prepare various competitive exams and different placement aptitude test as well.
5. Good analytical skill and sound knowledge in analogies will also enhance student's interview facing skill.

Course Content:

Module No.	Description	Hours	Blooms Level	PO (1..12) Mapping
1.	**Quantitative Aptitude:** 1) Quant foundation 2) Basic Multiplication 3) Division 4) Squaring numbers 5) Percentage 6) Ratio 7) Simple equation 8) Variation 9) Partnership 10) Profit & Loss	30	L1 (Remember) L2 (Understand) L3 (Apply)	PO6, PO7, PO8

2.	**Logical Mental ability -1:** 1) Coding and Decoding & Direction Sense 2) Series & Numbers 3) Blood Relations 4) Analogy	18	L1 (Remember) L2 (Understand) L3 (Apply)	PO6, PO7, PO8

Learning Resources:

Text Books:

1. Fast Track Arithmetic- Rajesh Verma
2. Verbal & non-verbal reasoning- R.S Agarwal
3. Quantitative Aptitude- R.S Agarwal
4. Analytical Reasoning –Peeyush Bhardwaj

2ND SEMESTER:-

Subject Code : IVC201	**Category** : Mandatory& Industry Value Added Course
Subject Name : General Studies and CA-II	**Semester** : 2nd
L-T-P : 2-0-0 (Total Contact Hrs. 2)	**Credit:** 0
Pre-Requisites: Fundamental knowledge of humanities & social science subjects till class 10th standard and knowledge of Economics up to class11th standard.	

Course Objective:

1. To learn aptitude and multiple tricky approaches.
2. To enhance the analytical skill and quick decision-making skill of the students. Good analytical skill and sound knowledge in analogies will also enhance student's interview facing skill.
3. To make them prepare for the various competitive exams and different placement aptitude test as well.
4. To enhance student's skill to appear in various aptitude test within limited time constrain.

Course Outcome:

1. This part of the syllabus will create base of general knowledge among students which is required to appear in various competitive exams in public sector jobs.
2. It will inculcate their rights & duties to the society, it will help them to act according to law in society.
3. It will also improve basic banking knowledge among students.
4. This part of the syllabus will enhance knowledge on National & International Current Affairs among students.

Course Content:

Module No.	Description	Hours	Blooms Level	PO(1..12) Mapping
1.	**Laws of Society:** History of Constitution, Preamble, Fundamental Rights, Directive Principle of State Policy and Fundamental Duties	8	L1 (Remember) L2 (Understand) L3 (Apply)	PO6, PO 7, PO8
2.	**Our Ancient Past:** Indus Valley Civilization, Vedic Civilization, 16 Mahajanapadas, Mauryan Dynasty.	10	L1 (Remember) L2 (Understand) L3 (Apply)	PO6, PO 7, PO8
3.	**Know Our Country:** Physiographic Division of India- Geological history of India, Northern Mountain, Mineral Resources of India.	8	L1 (Remember) L2 (Understand) L3 (Apply)	PO6, PO 7, PO8
4.	**Financial Planning and Market Laws:** Basic Concept of Economics, National	8	L1 (Remember) L2 (Understand) L3 (Apply)	PO6, PO 7, PO8

	Income, Unemployment and Poverty			
5.	**India and World:** Monthly Current Affairs Magazine	8	L1 (Remember) L2 (Understand) L3 (Apply)	PO6, PO 7, PO8
6.	**Universal Human Values:** Understanding Value Education, Method to fulfill the Basic Human Aspiration, Continuous happiness and Prosperity- the Basic Human Aspiration	6	L1 (Remember) L2 (Understand) L3 (Apply)	PO6, PO 7, PO8

Learning Resources:

Text Books:

- Indian Constitution- M.Laxmikant
- Indian Economy-Ramesh Singh
- India's Ancient Past- R.S.Sharma
- Geography of India- Majid Hussain

Reference Books:

- Current Affairs Magazine of IEM-UEM

3RD SEMESTER:-

Subject Code : IVC301	**Category**: Mandatory& Industry Value Added Course
Subject Name : General Studies and CA- III	**Semester** : 3rd
L-T-P : 2-0-0 (Total Contact Hrs. 2)	**Credit:** 0
Pre-Requisites: Basic Social Science from primary to high school, NCERTs	

Course Objective:

1. To learn about basic of History to know about our past and to implement it in our daily life.
2. To learn about the Political System of Our Country.
3. To learn the concepts of Basics of Geography and Economics from which Students will acquire knowledge for Competitive exams.

Course Outcome:

At the end of the course the students will be able

1. To inculcate human values and ethical thinking among students.
2. To prepare the stage for facing different levels of civil service and other competitive examinations.
3. To prepare the ground for making them aware of the happenings, cultural historical and developmental aspects of the country as well as global affairs
4. Learning current affairs with technique.

Course Content:

Module No.	Description	Hours	Blooms Level	PO(1..12) Mapping
1.	**Laws of Society :**Union Executive- President, Vice President, PM and Council of Ministers, Attorney General	6	L1 (Remember) L2 (Understand) L4 (Analyse)	PO6,PO7, PO8
2.	**Our Freedom Struggle**: Arrival of the Europeans- Portuguese, Dutch, English, French; Land Revenue System, Economic Exploitation of British Rule, Socio-religious Reforms Movement.	12	L1 (Remember) L2 (Understand) L3 (Apply) L4 (Analyze)	PO6,PO7, PO8
3.	**Know Our Country:** Physical Geography of India- Peninsular Plateau, Northern Great Plains, Coastal Plains, Soil of India.	12	L1 (Remember) L2 (Understand) L3 (Apply) L4 (Analyze)	PO6,PO7, PO8

4.	**RBI and Banking, India and World and Universal Human Values:** Banking System of India with reference to RBI, Capital Market Monthly Current Affairs Magazine and Understanding Human Beings as the co- existence of the self and the body, Program to ensure self-regulation and health, Understanding harmony in the nature.	6	L1 (Remember) L2 (Understand) L3 (Apply) L4 (Analyze)	PO6,PO7, PO8

Learning Resources:

Text Books:

1. NCERT Books from class 8-12.

Reference Books:

1. Indian Constitution-M.Laxmikant
2. Indian Economy-Ramesh Singh
3. History of Modern India- Bepan Chandra
4. Geography of India- Majid Hussain
5. Current Affairs Magazine of IEM-UEM

4TH SEMESTER:-

Subject Code : IVC401	**Category** : Mandatory& Industry Value Added Course
Subject Name : GENERAL STUDIES & CURRENT AFFAIRS-IV	**Semester** : 4th
L-T-P : 2-0-0 (Total Contact Hrs. 2)	**Credit:** 0
Pre-Requisites: Basic Social Science from primary to high school, NCERTs	

Course Objective:

1. To learn about basic of History to know about our past and to implement it in our daily life.
2. To learn about the Political System of Our Country.
3. To learn the concepts of Basics of Geography and Economics from which Students will acquire knowledge for Competitive exams.

Course Outcome:

At the end of the course the students will be able

1. To inculcate human values and ethical thinking among students.
2. To prepare the stage for facing different levels of civil service and other competitive examinations.
3. To prepare the ground for making them aware of the happenings, cultural historical and developmental aspects of the country as well as global affairs
4. Learning current affairs with technique.

Course Content:

Module No.	Description	Hours	Blooms Level	PO(1..12) Mapping
1.	**Laws of Society:** Central Legislative System of India, State Legislative System of India, Indian Judiciary	6	L1 (Remember) L2 (Understand) L4 (Analyse)	PO6,PO7, PO8
2.	**Heritage of India:** Islam and Early Muslim Invaders, Delhi Sultanate, Bhakti and Sufi Movement.	12	L1 (Remember) L2 (Understand) L3 (Apply) L4 (Analyze)	PO6,PO7, PO8
3.	**Know Our Country**: Rivers of India, Vegetation of India, Climate of India, Transport of India.	12	L1 (Remember) L2 (Understand) L3 (Apply) L4 (Analyze)	PO6,PO7, PO8
4.	**Revenue and Expenditure of India, India and World and Universal Human Values:** Tax System of India, Balance of Payment, Industrial Reforms, Monthly Current Affairs Magazine, Realising existence and co- existence at all levels, Holistic perception of Harmony in existence.	6	L1 (Remember) L2 (Understand) L3 (Apply) L4 (Analyze)	PO6,PO7, PO8

Learning Resources:

Text Books:

1. NCERT Books from class 8-12.

Reference Books:

1. Indian Constitution-M. Laxmikant
2. Indian Economy-Ramesh Singh
3. History of Modern India- Bepan Chandra
4. Geography of India- Majid Hussain
5. Current Affairs Magazine of IEM-UEM

5TH SEMESTER:-

Subject Code : IVC(ME)501	**Category**: Mandatory& Industry Value Added Course
Subject Name : ADVANCED TECHNICAL KNOWLEDGE-V	**Semester** : 5th
L-T-P : 2-0-0 (Total Contact Hrs. 2)	**Credit:** 0
Pre-Requisites: Basic Science of high school, NCERTs	

Course Objective:

1. To learn about basic of thermodynamics for professional exams
2. To learn about fundamentals of engineering mechanics for various exams
3. To learn about basic of Structure and properties of engineering materials for professional exams
4. To learn about fundamentals of Casting, Forming and Joining Processes for various exams

Course Outcome:

At the end of the course the students will be able

1. To develop an understanding of Free-body diagrams and equilibrium and their working principles.
2. To learn all types of kinematics and dynamics of particles and of rigid bodies in plane motion.
3. To understand thermodynamic property charts and tables.
4. To learn and understand the Structure and properties of engineering materials

Course Content:

Module No.	Description	Hours	BloomsLevel	PO(1..12) Mapping
1.	**ADVANCE PROFESSIONAL KNOWLEDGE-1** **Engineering Mechanics:** Free-body diagrams and equilibrium; trusses and frames; virtual work; kinematics and dynamics of particles and of rigid bodies in plane motion; impulse and momentum (linear and angular) and energy formulations, collision.	18	L1 (Remember) L2 (Understand) L4 (Analyse)	PO1,PO2, PO3
2.	**Module-2** **Casting, Forming and Joining Processes**: Different types of castings, design of patterns, moulds and cores; solidification and cooling; riser and gating design.Plastic deformation and yield criteria; fundamentals of hot and cold	18	L1 (Remember) L2 (Understand) L3 (Apply) L4 (Analyze)	PO1,PO2, PO3

	working processes; load estimation for bulk (forging, rolling, extrusion, drawing) and sheet (shearing, deep drawing, bending) metal forming processes; principles of powder metallurgy. Principles of welding, brazing, soldering and adhesive bonding **Thermodynamics**: Thermodynamic systems and processes; properties of pure substances, behaviour of ideal and real gases; zeroth and first laws of thermodynamics, calculation of work and heat in various processes; second law of thermodynamics; thermodynamic property charts and tables, availability and irreversibility; thermodynamic relations **Engineering Materials**: Structure and properties of engineering materials, phase diagrams, heat treatment, stress-strain diagrams for engineering materials			

Text Books:

G.K publishers GATE Mechanical Engineering,

Mcgraw hill GATE 2017 Mechanical Engineering,

Wiley GATE 2017 Mechanical Engineering,

6TH SEMESTER:-

Subject Code : IVC(ME)601	**Category**: Mandatory& Industry Value Added Course
Subject Name : ADVANCED TECHNICAL KNOWLEDGE-VI	**Semester** : 6th
L-T-P : 2-0-0 (Total Contact Hrs. 2)	**Credit:** 0
Pre-Requisites: Basic Science of high school, NCERTs	

Course Objective:

1. To learn about modes of heat transferand related laws for professional exams
2. To learn about fundamentals of fluid mechanics for various exams
3. To learn about basic of Structure and properties of mechanics of materials for professional exams
4. To learn about fundamentals of Hydraulics for various exams

Course Outcome:

At the end of the course the students will be able

1. To develop an understanding of heat transfer correlations and their laws and factors.
2. To apply the knowledge of turbo machinery.
3. To understand fluid statistics and fluid properties.
4. To learn and understand the Structure and properties of Hydraulic machines.

Course Content:

Module No.	Description	Hours	BloomsLevel	PO(1..12) Mapping
1.	**Heat-Transfer:** Modes of heat transfer; one dimensional heat conduction, resistance concept and electrical analogy, heat transfer through fins; unsteady heat conduction, lumped parameter system, Heisler'scharts; thermal boundary layer, dimensionless parameters in free and forced convective heat transfer, heat transfer correlations for flow over flat plates and through pipes, effect of turbulence; heat exchanger performance, LMTD and NTU methods; radiative heat transfer, Stefan-Boltzmann law, Wien's displacement law, black and grey surfaces, view factors,radiation network analysis	12	L1 (Remember) L2 (Understand) L4 (Analyze)	PO1,PO2, PO3

2.	Application: Turbomachinery: Impulse and reaction principles, velocity diagrams, Pelton-wheel, Francis and Kaplan turbine Fluid Mechanics: Fluid properties; fluid statics, manometry Mechanics of Materials: Stress and strain, elastic constants, Poisson's ratio; Mohr'scircle for plane stress and plane strain; thin cylinders; shear force and bending moment diagrams; bending and shear stresses; deflection of beams; torsion of circular shafts; Euler's theory of columns; energy methods; thermal stresses; straingauges and rosettes; testing of materials with universal testing machine; testing of hardness and impact strength	12	L1 (Remember) L2 (Understand) L3 (Apply) L4 (Analyze)	PO1,PO2, PO3
3.	Fluid Mechanics: Properties of fluids, fluid statics; Continuity, momentum, energy and corresponding equations; Potential flow, applications of momentum and energy equations; Laminar and turbulent flow; Flow in pipes, pipe networks; Concept of boundary layer and its growth. Hydraulics: Forces on immersed bodies; Flow measurement in channels and pipes; Dimensional analysis and hydraulic similitude; Kinematics of flow, velocity triangles; Basics of hydraulic machines, specific speed of pumps and turbines; Channel Hydraulics - Energy-depth relationships, specific energy, critical flow, slope profile, hydraulic jump, uniform flow and gradually varied flow	12	L1 (Remember) L2 (Understand) L3 (Apply) L4 (Analyze)	PO1,PO2, PO3

7TH SEMESTER

Subject Code : IVC(ME)701	**Category**: Mandatory& Industry Value Added Course
Subject Name : ADVANCED TECHNICAL KNOWLEDGE-VII	**Semester** : 7th
L-T-P : 2-0-0 (Total Contact Hrs. 2)	**Credit:** 0
Pre-Requisites: Basic Science of high school, NCERTs	

Course Objective:

1. To learn about theory of machines for professional exams
2. To learn about fundamentals of Metrology and Inspection for various exams
3. To learn about basic of Principle of non-traditional machining Processfor professional exams
4. To learn about fundamentals of Computer Integrated Manufacturing for various exams

Course Outcomes:

At the end of the course the students will be able

1. To develop an understanding of velocity and acceleration analysis of plane mechanisms.
2. To apply the knowledge oflinear and angular measurements.
3. To understand the application of Power Engineering.
4. To learn and understand theapplication of CAD/CAM.

Course Content:

Module No.	Description	Hours	Blooms Level	PO(1..12) Mapping
1.	ADVANCE PROFESSIONAL KNOWLEDGE-3 Theory of Machines: Displacement, velocity and acceleration analysis of plane mechanisms; dynamic analysis of linkages; cams; gears and gear trains, flywheels and governors; balancing of reciprocating and rotating masses; gyroscope. Vibrations: Free and forced vibration of single degree of freedom systems, effect of damping; vibration isolation; resonance; critical speeds of shafts Metrology and Inspection: Limits, fits and tolerances; linear and angular measurements; comparators; gauge design;	12	L1 (Remember) L2 (Understand) L4 (Analyse)	PO1,PO2, PO3

	interferometry; form and finish measurement; alignment and testing methods; tolerance analysis in manufacturing and assembly.			
2.	Machine Design: gears, rolling and sliding contact bearings, brakes and clutches, spring Applications: Power Engineering: Air and gas compressors; vapour and gas power cycles, concepts of regeneration and reheat. I.C. Engines: Air-standard Otto, Diesel and dual cycles. Refrigeration and air-conditioning: Vapour and gas refrigeration and heat pump cycles; properties of moist air, psychrometric chart, basic psychrometric processes. Turbomachinery: Impulse and reaction principles, velocity diagrams, Pelton-wheel, Francis and Kaplan turbines	12	L1 (Remember) L2 (Understand) L3 (Apply) L4 (Analyze)	PO1,PO2, PO3
3.	Principle of non-traditional machining Process Computer Integrated Manufacturing: Basic concepts of CAD/CAM and their integration tools	12	L1 (Remember) L2 (Understand) L3 (Apply) L4 (Analyze)	PO1,PO2, PO3

Text Books:

1. G.K publishers GATE Mechanical Engineering,
2. Mcgraw hill GATE 2017 Mechanical Engineering,
3. Wiley GATE 2017 Mechanical Engineering,

8TH SEMESTER

Subject Code : IVC801	**Category**: Mandatory& Industry Value Added Course
Subject Name : GENERAL STUDIES & CURRENT AFFAIRS-VIII	**Semester** : 8th
L-T-P : 2-0-0 (Total Contact Hrs. 2)	**Credit:** 0
Pre-Requisites: Basic Social Science of high school, NCERTs	

Course Objective:

1. To learn about CurrentAffairs for professional exams
2. To learn about fundamentals of general studiesfor various exams
3. To learn about basics of all the subjects includedfor professional exams
4. To learn about fundamentals of general knowledge for various exams

Course Outcome:

At the end of the course the students will be able

1. To develop an understanding of the things happening in various fields.
2. To be prepared for taking UPSC examinations
3. To be prepared for performing within a given time.
4. To apply the knowledge acquired through Mock Tests.

Course Content:

Module No.	Description	Hours	Blooms Level	PO(1..12) Mapping
1.	Mock tests of UPSC Prelims CSAT-I	36	L1 (Remember) L2 (Understand) L4 (Analyse)	PO1,PO2, PO3

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