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COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM UNIVERSITY EXAM	TWO TERM EXAM	TEACHER ASSESSTMENT*	END SEM UNIVERSITY EXAM	TEACHER ASSESSTMENT*				
DTME501A		OPERATION MANAGEMENT	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):

To introduction with (A) Introduction, (B) Product development, system design, productivity and quality control, (C) Planning and managing operations.

Course Outcomes (COs):

After completion of this course the students are expected to be able to demonstrate following knowledge, skills and attitudes;

1. Students would be able to understand the need of Operation management, changes and challenges.
2. Students would be able to analyses product strategy and development process.
3. Students would be able to understand material handling strategy and assembly line balancing.
4. Students will be able to understand the system design i.e. CPM PERT, line of balance etc
5. Students would be able to focus is on efficiency and effectiveness of processes.
6. Students would be able to demonstrate various case studies based on new product development, Assembly line balancing, Value engineering, supply chain management etc.

Syllabus

UNIT – I

Introduction: Introduction of Operations Management and overview; Operations Management Strategy, framework, Understanding, similarities and difference among products, goods and services; Historical evolution of operations management, Changes and Challenges; Stages of Product Development.

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UNIT - II

Product Development: Product Strategy and integrated product development; Process Strategy; Capacity Planning Decisions; Facilities Location Strategies.

UNIT - III

System Design: Facilities Layout and Material Handling Strategy; Group Technology; Flexible manufacturing system; Assembly line balancing; Project Management-CPM and PERT; Line of Balance (LOB).

UNIT - IV

Productivity & Quality tools, Productivity Concepts: Quality Circle; Kaizen and other SGA; Value analysis and Value Engineering; Total Quality management; Statistical Quality Control; Maintenance Planning and Control (Reliability, availability and maintainability).

UNIT-V

Planning and Managing Operations: Demand Forecasting; Value chain and Supply chain Management; Purchasing, vendor selection and material management; Inventory Management and Just-in-Time Systems; Materials Requirement Planning; MRP II and ERP Aggregate Process Planning; Scheduling, sequencing and dispatching.

Reference Books:

1. *"Management of Production Systems", Aggarwal L.N, Parag Diwan , Global Business Press, 1997.*
2. *"Production and Operations Management, Alan Muhlemann, John Oakland, Keith Lockyer, Mac Milan, India, IV Edition, 1978.*
3. *"Production and Operations Management", Chary SN, Tata Mc Graw Hill III Edition, 2004.*
4. *"Production and Operation Management", Ramamurthy P, New Age international Publishers, 2005.*

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			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM UNIVERSITY EXAM	TWO TERM EXAM	TEACHER ASSESSTMENT*	END SEM UNIVERSITY EXAM	TEACHER ASSESSTMENT*				
DTME501B		TOOL 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 20 marks.

Course Educational Objectives (CEOs):

The theory should be taught and practical should be carried out in such a manner that students are able to acquire (A) Re-sharpen given cutting tool. (B) Interpret designation system of cutting tool and tool holder. (C) Select locating and clamping devices for given component. (D) Select and design jig and fixture for given simple component. (E) Classify and explain various press tools and press tools operations. (F) .Select a die for a given simple component.

Course Outcomes (COs):

The theory should be taught and practical should be carried out in such a manner that students are able to acquire different learning outcomes in cognitive, psychomotor and affective domain to demonstrate following course outcomes.

1. Re-sharpen given cutting tool.
2. Interpret designation system of cutting tool and tool holder.
3. Select locating and clamping devices for given component.
4. Select and design jig and fixture for given simple component.
5. Classify and explain various press tools and press tools operations.
6. Select a die for a given simple component.

Syllabus

UNIT-I

Introduction: Concept, meaning and definitions of tool; tool design and tool engineering; Tool types, features & applications; Tool engineering-functions and importance to enhance productivity and quality; Importance of process planning in tool engineering.

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UNIT – II

Tooling Classification: Tool classification- Types, material properties and application; general design considerations; Design of single point cutting tool for strength & rigidity; Design strategies for H.S.S. Carbide and Ceramic tools; Chip Breakers; Design of form tool; Design of drill and milling cutters.

UNIT - III

Jigs and Fixtures: Definition, purpose and basic elements of designing jig and fixture; Functions of Jigs and fixtures; Clamping devices; Locators: Types, nomenclature, principle, Working, and applications; 3-2-1 principle of location; Work holding devices; various clamping devices, Tool guiding methods and guide bushings; Types of drill jigs and their application; Common types of milling fixtures, Welding fixture.

UNIT-IV

Tooling for forging and rolling: Equipment, Design principles for forging dies, drop forging and upset forging; Design principles and practice for rolling; Roll pass design- Sketch, principle, working and applications of mold Extrusion, Plastic injection and Blow molding.

UNIT -V

Press Tools: Types, working, components and their functions; Calculations of press tonnage and shut height of press tool; Shear action in die cutting operation; Die clearance; Cutting force-Methods to calculate and methods of reducing; Shear angle- concept, need and method to give shear angle on punch and die; Types, principle, working and applications of stock stop, pilots, strippers and knockouts; Cutting dies-types, principles, working and applications.

Reference Books:

1. *Fundamentals of tool design by ASTME published by PHI, 2010.*
2. *Jigs and fixture by P. H. Joshi published by TMGH, 2010.*
3. *D Smith, David A. (EDT) Smith, Dies Design Handbook, Society of Manufacturing Engineers, 1990.*
4. *N K Mehata, Metal Cutting & Tool Design, Tata McGraw-Hill Education, 2014.*
5. *Design of Jigs, Fixtures and Press Tools By: K Venkataraman, K. Venkataraman Publisher: Wiley, 2015.*

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			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM UNIVERSITY EXAM	TWO TERM EXAM	TEACHER ASSESSTMENT*	END SEM UNIVERSITY EXAM	TEACHER ASSESSTMENT*				
DTME501C		INDUSTRIAL MANAGEMENT	60	20	20	30	20	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):

The basic objectives of subject are (A) To understand fundamentals of industrial management practices. (B) To understand basics of system thinking. (C) To understand the concepts of material management. (D) To understand fundamentals of planning. (E) To understand basics of product planning and control. (F) To understand new trends in management.

Course Outcomes (COs):

After completion of this course the students are expected to be able to demonstrate following knowledge, skills and attitudes,

1. Students would be able to understand the need of fundamentals of industrial management practices.
2. Students would be able to analyses basics of system thinking and able to understand its aspects.
3. Students would be able to understand concepts of material management.
4. Students would be able to recognize fundamentals of planning and their need.
5. Students will be able to understand the basics of product planning and control.
6. Students would be able to understand new trends in management.

Syllabus

UNIT – I

Introduction: Definition and functions of management; Management theories - Decision, Quantitative, Mathematical and Behavioral Science.

System Thinking: System definition and parameters; Different production and nonproduction systems; system design; different types of models under system thinking.

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UNIT - II

Material Management: Introduction, function, purchase systems, stock turn-over and ordered quantity; Inventory- need of inventory control, EOQ and simple numerical problems on EOQ; Safety stock; different techniques of inventory control; ABC analysis (simple treatment only).

UNIT - III

Planning: Nature, importance and purpose of planning process; Objectives, types of plans (Meaning only); Decision making; Importance of planning steps in planning and planning premises Hierarchy of plans.

UNIT - IV

Production Planning and Control: Production systems; characteristics of each type; production and consumption rate; PPC functions, Gantt chart, advantages and preparation of Gantt chart (simple cases only); Critical ratio scheduling.

UNIT-V

New Trends in Management: Role of computers in management; Introduction to Management Information System (MIS);Total Quality Management (TQM) - Introduction, stages of development, Inspection, methods of Quality Control and Quality Assurance; Introduction to ISO-9000, Deming's PDCA Cycle (Plan, Do, Check and Action); Japanese Quality Management; Kaizen Strategy (continuous improvement); Just in Time (JIT) - concept and application.

Reference Books:

1. *Principles of Management – P.C. Tripathi, P.N. Reddy – Tata McGraw Hill, 2012.*
2. *Learning Package on Industrial Management Publisher: TTTI, Bhopal, 2007.*
3. *Industrial Engineering and Management by O. P. Khanna, Khanna Publisher, 2010.*
4. *Management – Stephen Robbins – Pearson Education/PHI – 17th Edition, 2003.*
5. *Industrial Organization and Management by K. K. Ahuja, 2009.*

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			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM UNIVERSITY EXAM	TWO TERM EXAM	TEACHER ASSESSTMENT*	END SEM UNIVERSITY EXAM	TEACHER ASSESSTMENT*				
DTME502		ESTIMATING, COSTING AND CONTRACTING	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):

To introduce the students with the basics of (A) Estimation, (B) Process and production cost (C) Budgeting and Contracting.

Course Outcomes (COs):

After completion of this course the students are expected to be able to demonstrate following knowledge, skills and attitudes

1. Students would be able to calculate material cost of given component/ product.
2. Students would be able to identify and estimate elements of cost in various processes.
3. Students would be able to understand break even analysis to calculate break even quantity.
4. Students will be able to investigate the problem of cost and suggest their solution using cost reduction techniques.
5. Students would be able to interpret given model of balance sheet and profit loss account.
6. Students would be able to prepare simple engineering contracts.

Syllabus

UNIT - I

Estimating- Need, Scope & importance in industries; Qualities of estimator; Estimating procedures, Sources of error; Constituents of estimation.

Costing- Need, Scope & importance in industries; Difference between estimating and costing; Procedure for costing; Costing methods; Advantages of efficient costing; Classification of costs.

Elements of costs: Element of cost material; labor costs; Expenses; Component of costs; Terminology associated with overheads, their classification and allocation; Depreciation and

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obsolescence- Definition, types, different methods of calculating depreciation, numeric examples; Method to calculate machine hour rate (MHR) and process hour rate (PHR).

UNIT - II

Break Even Analysis: Classification of costs as fixed and variable costs; Relationship between the costs and quantity of production; Construction of breakeven charts and determination of breakeven quantity from given data; Definition of Break Even Point (BEP) and its needs in industry; Assumptions made in constructing Break even chart.

UNIT - III

Cost Estimation of Forging: Cost terminology associated with forging shop; Procedure of calculating material cost of a product for forging shop (including input weight, cut weight, forged weight etc.); Procedure of estimating cost of forging dies.

Cost Estimation of Casting: Cost terminology associated with foundry shop; Procedure of calculating material cost of a product for foundry shop; Procedure of estimating cost of pattern making; Procedure of estimating foundry cost.

UNIT - IV

Cost Estimation of Machined Part: Terminology associated with machine shop estimation; Procedure of estimating cost of machined part for following operations- Lathe operations (Turning, Knurling, Facing, Boring, Drilling, Reaming, Tapping and Threading); Power consumption; Metal removal rates; Tool life.

UNIT-V

Budgeting and Contracting: Define budget, Purpose of budget, Various types and benefits of budget; Prepare simple budget given required input data; Explain various accounting terminology like book value, Net Present Value, Work in progress, Gross Domestic Product (GDP), Balance sheet terminology, etc.; Define contracts, its characteristics and advantages; Types of contract; Tendering, manual tendering and E-tendering; Provision of different conditions in a contract; Documents required in an engineering contract.

Reference Books:

1. *R. Kesavan, C. Elanchezhian, B. Vijaya Ramanath; "Process Planning and Cost Estimation"; New Age International New Delhi; 2011.*
2. *Banga & Sharma; "Mechanical Estimating & Costing, including Contracting"; Publisher: Khanna Publication., 2011.*
3. *Shrimali & Jain; "Mechanical Estimating & Costing" Khanna Publications., 2011.*
4. *Singh & Khan "Mechanical Costing& Estimation"; Publisher: Khanna Publishers., 2013*
5. *O.P. Khanna "A Text Book of Mechanical Estimating & Costing"; Dhanpat Rai Publications; 2013.*

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			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM UNIVERSITY EXAM	TWO TERM EXAM	TEACHER ASSESSTMENT*	END SEM UNIVERSITY EXAM	TEACHER ASSESSTMENT*				
DTME503		MACHINE DESIGN	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 20 marks.

Course Educational Objectives (CEOs):

Students will learn (A) How to apply the concepts of stress analysis(B)Theories of failure and selection of machine components(C)Familiarize the various steps involved in the Design Process (D) The principles involved in evaluating the shape and dimensions of a component(E)Functional and strength requirements, (F) Use of standard practices and standard data.

Course Outcomes (COs):

After completion of this course the students are expected to be able to demonstrate following knowledge, skills and attitudes

1. Students will be able to know about the machine elements, mechanical properties and types of failure.
2. Students will be able to Design of shaft and flange coupling.
3. Students will be able to Design of machine elements subjected to different types of load and moment.
4. Students will be able to Design Riveted joint, welded joints and Threaded joints.
5. Students will be able to Design of Clutch.

Syllabus

UNIT- I

Introduction to Machine Design: Machine and machine elements; Introduction of bolt, nut, axle, shaft, bearing, coupling, clutch, belt, rope, chain, gear etc; Basic design procedure, Basic

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requirements for machine elements; General design considerations like fatigue, creep, fabrication methods and economic considerations for strength.

UNIT-II

Shafts, Keys and Couplings: Various types of shafts; Stresses in Shafts; Design of shafts(solid and hollow) subjected to torque and bending moment; Definition of term key; Its various types, Splines, Forces acting on sunk keys; Shaft coupling and its various types; Design of flanges coupling.

UNIT-III

Design of Machine Elements: Design of Machine Elements Subjected to Direct and Shear Loads; members subjected to direct loads – bolt, column, rod, cotter and knuckle joints; members subjected to shear loads- rivet, cotter knuckle pin, root of threaded bolt, coupling, bolt and key; Design of Machine Elements Subjected to Bending Moment, Twisting Moment and Combined Bending and Twisting Moment; Introduction to pure bending, fundamental equation of pure bending.

UNIT-IV

Design of Riveted Joint, Welded Joints, Threaded Joints: Types of Riveted joint - lap and butt joint; Modes of failure of riveted joints; Definition of welding, types of welded joints, strength of the butt weld; Types of threads and their proportions.

UNIT-V

Design of Clutch and Brakes:

Clutch: Need, Classification, Construction and Working of single and multi plate clutches; power transmitted by single and multi plate clutches.

Brake: Need & Classification of Brakes, Constructional detail and working of mechanical brakes; hydraulic and vacuum brake; Details of master cylinder, wheel cylinder, Concept of brake drum, brake lining and brake equipment; Bleeding of brake.

Reference Books:

1. *"Text book of Machine Design" by R.S. Khurmi &; J.K. Gupta;S.Chand Publication, 2005*
2. *"Design of Machine Elements" by Bhandari, Tata McGraw-Hill Publishing Company Ltd, 2016.*

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3. *"Machine Design "by Sadhu Singh, Khanna Publishers, 2014.*
4. *"Machine Design" by, Sharma and Agrawal, S. K. Kataria & Sons, 2012.*
5. *"Machine Design Vol-II & II"I by F. Haideri, Nirali Prakashan, Pune, 2011.*
6. *"Machine Design" by Pandya and Shah, Charotar Publishing House, 2010.*

Note: PSG Design data book and/ or Mahadevan and Reddy's Mechanical design data book are to be provided/ permitted in exam hall (duly verified by authority)

List of Practical's:

Designing and sketching of components contained in the syllabus.

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			END SEM UNIVERSITY EXAM	TWO TERM EXAM	TEACHER ASSESSTMENT*	END SEM UNIVERSITY EXAM	TEACHER ASSESSTMENT*				
DTME504		HEAT TRANSFER	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 20 marks.

Course Educational Objectives (CEOs):

To introduction with (A) Importance of heat transfer, (B) various modes of heat transfer in detail (C) Heat Exchanger (D) Radiation.

Course Outcomes (COs):

After completion of this course the students are expected to be able to demonstrate following knowledge, skills and attitudes

1. Students would be able to understand various modes of heat transfer.
2. Students would be able to analyses basics difference of conduction, convection and radiation.
3. Students would be able to understand significant of various dimension less no in convection.
4. Students will be able to understand concept of radiation.
5. Students would be able to explain concept boiling of liquids.

Syllabus

UNIT - I

Basic Concepts: Modes of heat transfer; Fourier's law; Newton's law; Stefan Boltzmann law; thermal resistance and conductance; analogy between flow of heat and electricity; combined heat transfer process;

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Conduction: Fourier heat conduction equation; its form in rectangular, cylindrical and spherical coordinates; thermal diffusivity, linear one dimensional steady state conduction through a slab, tubes, spherical shells and composite structures; electrical analogies, critical-insulation-thickness for pipes; effect of variable thermal conductivity.

UNIT-II

Transient Heat Conduction: Lumped heat capacity analysis; time constant; transient heat conduction in solids with finite conduction and convective resistances

Heat Transfer from Extended Surface: Types of fin; heat flow through rectangular fin; infinitely long fin, fin insulated at the tip and fin losing heat at the tip; efficiency and effectiveness of fin; Biot number.

UNIT-III

Convection: Newton's law of cooling; Dimensional analysis applied to forced and free convection; dimensionless numbers and their physical significance; empirical correlations for free and forced convection, Continuity, momentum and energy equations.

UNIT-IV

Heat Exchangers: Types- parallel flow, counter flow; evaporator and condensers; overall heat transfers coefficient; fouling factors; long-mean temperature difference (LMTD); method of heat exchanger analysis; effectiveness of heat exchanger; NTU method.

UNIT-V

Radiation: Introduction, absorption and reflection of radiant energy, Emission, Black and nonblack bodies, Kirchhoff's law; intensity of radiation, radiation Exchange between black surface; geometric configuration factor; gray body relation exchange between surfaces of unit configuration factors.

Reference Books:

1. *Kumar DS; "Heat and mass transfer"; SK Kataria and Sons Delhi, 2008.*
2. *RK Rajput; "Heat and mass transfer" S Chand Publication New Delhi, 2010.*
3. *Kothandaraman, CP., "Fundamentals of Heat and Mass Transfer", Second Edition, New Age International Publishers, Chennai, 1997.*
4. *Sachdeva, KC, "Fundamentals of Engineering Heat and Mass Transfer", New Age International Publishers, New Delhi, 1996.*
5. *Holman, J.P., "Heat Transfer", Tata McGraw Hill Book Company, 1988.*

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List of Practical's:

1. Conduction through a rod to determine thermal conductivity of material.
2. Forced and free convection over circular cylinder.
3. Free convection from extended surfaces.
4. Parallel flow and counter flow heat exchanger effectiveness and heat transfer rate.
5. Experimental determination of Stefan-Boltzmann constant.

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			END SEM UNIVERSITY EXAM	TWO TERM EXAM	TEACHER ASSESSTMENT*	END SEM UNIVERSITY EXAM	TEACHER ASSESSTMENT*				
DTME505		AUTOMOBILE ENGINEERING	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 20 marks.

Course Educational Objectives (CEOs):

To convey students with the knowledge of chassis layout, suspension system, braking system, wheel and tyres, frame and body, transmission, steering system, ignition-system and automobile safety

Course Outcomes (COs):

After completion of this course the students are expected to be able to demonstrate following knowledge, skills and attitudes

1. Students would be able to understand the need of automobile in society.
2. Students would be able to analyses basics of automobile and able to understand various applications.
3. Students would be able to understand I C engines, their working and operating conditions.
4. Students will be able to understand the basics of gearbox, drives, steering system and suspension system.
5. Students would be able to understand automobile safety and their need.
6. Students would be able to understand clutches, brakes and ignition system.

Syllabus

UNIT - I

Introduction: Need, Scope & importance of Automobile Engineering; elements of automobile; Layout of Chassis and body; Types of bodies; Various operating systems used in automobile, Internal combustion engines-types, thermodynamic cycles used (Otto/Diesel Cycles); comparison of petrol and diesel engines; fuel used and general arrangement sketch for each.

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UNIT- II

Gear Boxes: Sliding mesh and constant mesh; synchromesh and Epicyclic gear boxes; Automatic transmission system.

Drives/Transmission: Overdrive, Propeller shaft; Universal joints; Differential; Rear axle drives; Rear axle types; Front wheel and all-wheel drive.

UNIT-III

Wheels and Tyres: Tyre types, construction; Tyre inflation pressure, Tyre wear and their causes and application.

Steering system: steering gear boxes; steering linkages; steering mechanism; under and over steering; Steering Geometry-Effect of camber, caster, king pin inclination, toe in and toe out.

Suspension system: objective and requirements; Suspension spring, front and rear suspension systems; Independent suspension system and Shock absorbers.

UNIT-IV

Clutches: Single plate, multi-plate, cone clutch, semi centrifugal, electromagnetic, vacuum and hydraulic clutches; Fluid coupling.

Brakes: Classification and function; Mechanical, hydraulic, vacuum air and self engineering brakes; Brake shoes and lining materials.

UNIT-V

Ignition System: Magneto and coil ignition systems; System components and requirements; automotive lighting: Wiring systems, head lamp, electric horn and fuel level indicator.

Automobile Safety: Safety requirements; Safety Devices- Air bags, belts, radio ranging, NVS (Night Vision System) and GPS (Global Positioning System).

Reference Books:

1. *Kirpal Singh, Automobile Engineering, Standard Edition 2003*
2. *R K Rajput, a Text book of Automobile Engineering, Laxmi Publication.(2007)*
3. *Jornsen Reimpell Helmut Sto; the Automobile Chassis: Engineering Principles, Jurgen Betzler (P) Ltd.*
4. *Basic Automobile Engineering (Hindi) 19/e (PB)By: Nakara C P,Dhanpat Rai & Sons(2015)*
5. *P S Gill, a Text book of Automobile Engineering, KATSON Books VOL 1&2 Edition 2010*
6. *S K Gupta, a Text Book of Automobile Engineering, S Chand Publication.*
7. *Sudhir Kumar Saxena, Automobile Engineering, Laxmi Publication (P) Ltd.(2010)*

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List of Practical's:

1. Study of various tools used in Auto workshop.
2. Study of conventional layout of vehicle.
3. Study and inspection of suspension system of light and heavy vehicles.
4. Study of mechanical and hydraulic braking system and bleeding of hydraulic braking system.
5. Study of Steering system of four wheeler.
6. Study of clutch (single plate & multi plate).
7. Study of sliding mesh, constant mesh and synchronous mesh gear boxes.
8. Study of Propeller shafts, Universal joints, sliding joint, differential and rear axle.
9. Study of frame & body of vehicle.
10. Visit to nearby auto workshop and service station.

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COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM UNIVERSITY EXAM	TWO TERM EXAM	TEACHER ASSESSTMENT*	END SEM UNIVERSITY EXAM	TEACHER ASSESSTMENT*				
DTME506		CAD/CAM/CIM LAB	0	0	0	30	20	0	0	4	2

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):

To understand (A) the current available CAD/CAM hardware, software and fundamentals(B)To learn new design optimization techniques and newer techniques in CAD/CAM(C)Students will gain a basic understanding of computer numerical control (CNC) machining processes and operations using a combination of G-codes, milling and turning machines.

Course Outcomes (COs):

1. Use CAD software to generate a computer model and technical drawing for a simple, well-defined part or assembly.
2. Generate and interpret engineering technical drawings of parts and assemblies according to engineering design standards.
3. To demonstrate a basic understanding of machining fundamentals including speed and feed calculations, tooling systems, and work-holding systems for CNC milling and turning equipment.
4. To demonstrate a basic and advanced understanding of numerical controlled (NC) programming strategies.
5. To demonstrate ability to set-up, program, and operate CNC milling and turning equipment. To demonstrate an ability to generate NC code using G-codes to machine parts to specifications.

List of Practical's:

1. Experiments and problem based on theory topics
2. Study of CAD Hardware system using physical and visual aid

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SEMESTER V

3. Auto CAD commands and their applications in various types of designs/ drawings. ten/fifteen experiments
4. Solid modeling using parametric software
5. Demonstration of CNC machine for identifying machine zero, drive systems, safety precautions.
6. Write CNC part programming of a given component.

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			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM UNIVERSITY EXAM	TWO TERM EXAM	TEACHER ASSESSTMENT*	END SEM UNIVERSITY EXAM	TEACHER ASSESSTMENT*				
DTME507		MINOR PROJECT	0	0	0	30	20	0	0	4	2

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Syllabus

Purpose:

To carry out a design project in one of the specializations of the program with substantial multidisciplinary component.

Instructional Objectives:

To guide the students in such a way so that they carry out a work on a topic as a forerunner to the full-fledged project work to be taken subsequently in VI semester; the project work shall consist of substantial multidisciplinary component

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