



Shri Vaishnav Vidyapeeth Vishwavidyalaya

B.TECH AGRICULTURAL ENGINEERING

SEMESTER II

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 *
BTAE201	DCS	ENVIRONMENTAL SCIENCE AND DISASTER MANAGEMENT	2	0	1	3	50	30	0	15	5

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.

Course Objectives (CEOs):

(A) To understand sources of information required for addressing environmental challenges (B) To identify a suite of contemporary tools and techniques in environmental informatics (C) To apply literacy, numeracy and critical thinking skills to environmental problem-solving

Course Outcomes (COs):

1. Apply the principles of ecology and environmental issues that apply to air, land and water issues on a global scale.
2. Develop critical thinking and/or observation skills, and apply them to the analysis of a problem or question related to the environment.
3. Demonstrate ecology knowledge of a complex relationship between predators, prey, and the plant community.

Syllabus

Unit-I

Environmental Studies: Scope and importance. **Natural Resources:** Renewable and nonrenewable resources Natural resources and associated problems. **a) Forest resources:** Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forest and tribal people. **b) Water resources:** Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems. **c) Mineral resources:** Use and exploitation, environmental effects of extracting and using mineral resources, case studies. **d) Food resources:** World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies. **e) Energy resources:** Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources. Case studies. **f) Land resources:** Land as a resource, land degradation, man induced landslides, soil erosion and desertification.



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Role of an individual in conservation of natural resources. Equitable use of resources for sustainable lifestyles

Unit-II

Ecosystems: Concept, Structure, function, Producers, consumers, decomposers, Energy flow, ecological succession, food chains, food webs, ecological pyramids. Introduction, types, characteristic features, structure and function of the forest, grassland, desert and aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries).

Biodiversity and its conservation:-Introduction, definition, genetic, species & ecosystem diversity and bio-geographical classification of India. Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values. Biodiversity at global, National and local levels, India as a mega-diversity nation. Hot-spots of biodiversity. Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts. Endangered and endemic species of India. Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

Unit-III

Environmental Pollution: definition, cause, effects and control measures of a. Air pollution b. Water pollution c. Soil pollution d. Marine pollution e. Noise pollution f. Thermal pollution g. Nuclear hazards. Solid Waste Management: causes, effects and control measures of urban and industrial wastes. Role of an individual in prevention of pollution. Pollution case studies. Social Issues and the Environment from Unsustainable to Sustainable development, Urban problems related to energy. Water conservation, rain water harvesting, watershed management.

Environmental ethics: Issues and possible solutions, climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Wasteland reclamation. Consumerism and waste products.

Unit-IV

Environment Protection Act. Air (Prevention and Control of Pollution) Act. Water (Prevention and control of Pollution) Act. Wildlife Protection Act. Forest Conservation Act. Issues involved in enforcement of environmental legislation. Public awareness. Human Population and the Environment: population growth, variation among nations, population explosion, Family Welfare Programme. Environment and human health: Human Rights, Value Education, HIV/AIDS. Women and Child Welfare. Role of Information Technology in Environment and human health.

Unit-V

Natural Disasters:: Natural Disasters and nature of natural disasters, their types and effects. (Floods, drought, cyclone, earthquakes, landslides, avalanches, volcanic eruptions)

Disaster Management- Effect to migrate natural disaster at national and global levels. International strategy for disaster reduction. Concept of disaster management, national disaster management framework; financial arrangements; role of NGOs, community-based organizations



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and media. Central, state, district and local administration; Armed forces in disaster response; Disaster response; Police and other organizations

Text Book:

1. Basics of Environmental Studies by 2012 Dr. N. S. Varandani, Books India Publications
2. Climate change.1995: Adaptation and mitigation of climate change-Scientific Technical Analysis Cambridge University Press, Cambridge.
3. Sharma, R.K. & Sharma, G. 2005. Natural Disaster. APH Publishing Corporation, Delhi.
4. Husain Majid. 2013. Environment and Ecology: Biodiversity, Climate Change and DisasterManagement. online book.

Reference Book:

1. Bharucha Erach. 2005. Text Book of Environmental Studies for Undergraduate Courses. University Grants Commission, University Press, Hyderabad.
2. Sharma J P. 2003. Introduction to Environment Science. Lakshmi Publications.
3. Chary Manohar and Jaya Ram Reddy. 2004. Principles of Environmental Studies. BS Publishers, Hyderabad.
4. Kaul S N, Ashuthosh Gautam. 2002. Water and Waste Water Analysis. Days Publishing House, Delhi.
5. Gupta P K. 2004. Methods in Environmental Analysis – Water. Soil and Air. Agro bios, Jodhpur.

List of Practical's:

- 1 Visit to a local polluted site-urban/industrial/ rural/agricultural
- 2.Visit to a local area to document environmental assets river/forest/grassland/hill/mountain
- 3 Pollution case studies with respect to crop production
- 4 study of simple ecosystems-pond, river, hill slopes
- 5 study of common plants, insects, birds
- 6 Study of Crop contingent plan under natural calamities.
- 7 Case studies related to disaster management
- 8 Study of Natural and Manmade Disaster
- 9 Visit to meteorological observatory



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							THEORY			PRACTICAL	
							END SEM University Exam	Two Term Exam	Teachers Assessment *	END SEM University Exam	Teachers Assessment *
BTAE202	DCS	ENTREPRENEURSHIP DEVELOPMENT AND BUSINESS MANAGEMENT	2	0	1	3	50	30	0	15	5

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.

Course Objectives (CEOs):

To introduction with (A) project management and entrepreneurship development, (B) to train the students to develop new projects, and (C) encouraging them to start their own ventures.

Course Outcomes (COs):

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

1. Student will be able to understand the concepts of entrepreneurship development.
2. Student will acquaint with the special challenges of starting new ventures and introducing new product and service ideas.
3. Student will be able to create an awareness of the need for systematic management of projects.
4. Student will be able to understand concept Value Engineering and System Engineering.
5. Student will be able to start projects from identification till project termination.

Syllabus

UNIT I

Basis Introduction, Concept of Entrepreneurship, Need of Entrepreneurship Development, Innovation, Invention, Creativity, Business Idea, Opportunities through change. Concepts of Entrepreneur, Manager, Entrepreneur / Corporate Entrepreneur – comparative study - Roles, Responsibilities, Career opportunities.

Entrepreneurship as a career, Entrepreneurship as a style of management, the changing role of the entrepreneur: Entrepreneurship; Management – Management functions – planning-Organizing -Directing – motivation – ordering – leading – supervision.

UNIT II

Gaining insight into entrepreneurship innovation and leadership skills, creativity and idea generation, role of motivation, social entrepreneurship. Role of Business plan market assessment,



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marketing mix. Distribution, casting, pricing, sales & promotion, financial viability, risks and sensitivity analysis, Business Laws Details of various laws, Marketing channel and method of marketing. Processing and value additions in rural products, five key elements of entrepreneurship.

UNIT III

Communication and control – Capital – Financial management – Agro-based industries – Project – project cycle – payback period – Discounted measures – Net Present Value (NPV) – Benefit-Cost Ratio (BCR) – Internal Rate of Return (IRR) – Net benefit investment ratio (N / K ratio) – sensitivity analysis-Importance of agribusiness in Indian economy, International trade-WTO agreements – Provisions related to agreements in agricultural and food commodities. Agreements on agriculture (AOA) – Domestic supply, market access, export subsidies agreements on sanitary and phyto-sanitary (SPS) measures, Trade related intellectual property rights (TRIPS). Export and Import Policies relevant to horticulture sector. Characteristics of Indian farm machinery industry. Social Responsibility of Business.

UNIT IV

Entrepreneurship, Significance of entrepreneurship in economic development qualities of entrepreneur, entrepreneurship development programs and role of various institutions in developing entrepreneurship, life cycles of new business, environmental factors affecting success of a new business, reasons for the failure and visible problems for business' Developing effective business plans, Procedural steps in setting up of an industry'. Project appraisal and evaluation techniques – undiscounted measures – payback period – proceeds per rupee of outlay, Discounted measures – Net Present Value (NPV) – Benefit-Cost Ratio (BCR) – Internal Rate of Return (IRR) – Net benefit investment ratio (N / K ratio) – sensitivity analysis-Importance of agribusiness in Indian economy International trade-WTO agreements .

UNIT V

Role of ED in economic development of a country-Overview of Indian social, political systems and their implications for decision making by individual entrepreneurs Economic system and its implications for decision making by individual entrepreneurs- Social responsibility of business. Morals and ethics in enterprise management - SWOT analysis, Government schemes and incentives for promotion of entrepreneurship. Government policy on small and medium enterprises (SMEs)/SSIs/MSME sectors.

Text Book:

1. Harsh, S.B., Conner, U.J. and Schwab, G.D. 1981. Management of the Farm Business. Prentice .
2. Joseph, L. Massie. 1995. Essentials of Management. Prentice Hall of India Pvt. Ltd., New Delhi.



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3. Omri Rawlins, N. 1980. Introduction to Agribusiness. Prentice Hall Inc., New Jersey.
4. Agarwal R.D. (1993). Organization & Management. Tata- Mc Graw Hill Publishing Company Ltd.

Reference Books:

1. Mark J Dollinger. 1999. Entrepreneurship Strategies and Resources. Prentice-Hall, Upper Saddal Rover, New Jersey.
2. Khanka S S. 1999. Entrepreneurial Development. S. Chand and Co. New Delhi.
3. Mohanty S K. 2007. Fundamentals of Entrepreneurship. Prentice Hall India Ltd., New Delhi.
4. Anil. S. Kumar, S.C Poornima, M.K. Abraham, K. Jayashree . Entrepreneurship Development. New Age International Publishers, New Delhi.

List of Practical's:

1. Preparation of business – Strengths Weaknesses Opportunities and Threats (SWOT) analysis.
2. Analysis of financial statements (Balance Sheet, Profit loss statement).
3. Compounding and discounting, Break-even analysis Visit to agro-based industries – I
4. Visit to agro-based industries – II - Study of Agro-industries Development Corporation.
5. Formulation of project feasibility reports – Farm Machinery Project proposals as entrepreneur – individual and group.



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							THEORY			PRACTICAL	
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
BTAE203	DCS	FLUID MECHANICS AND OPEN CHANNEL HYDRAULICS	2	0	1	3	50	30	0	15	5

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.

Course Objectives (CEOs):

To introduction with (A) Fluid and its properties, (B) behavior fluid under various conditions, (C) understanding the behavior of pipe flow, (D) Applications.

Course Outcomes (COs):

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

1. Correlate fundamentals of fluid mechanics with various mechanical systems.
2. Understand basics of compressible flow.
3. Understand fundamentals of flow through pipes.
4. Understand fundamentals of dimensional analysis and similitude.
5. Understand statics, dynamics and various approaches to fluid mechanics.

Syllabus

UNIT-I

Properties of Fluids:

Introduction: Fluid, Ideal and real fluid, Types of fluids, physical properties such as density, specific weight, viscosity, Newton's law of viscosity.

Pressure and its Measurement:- Pascal's law, pressure measurement with manometers, different types of manometers. Centre of pressure, buoyancy, meta centre and meta centric height, condition of floatation and stability of submerged and floating bodies Hydrostatic law, pressure forces on plane and curved surfaces,;

UNIT-II

Kinematics of Fluid Flow: Lagrangian and Eulerian description of fluid motion, continuity equation, Continuity equation for three dimensional flow in Cartesian co-ordinates. path lines, streak lines and stream lines, stream function, velocity potential and flow net. Types of fluid flow, translation, rotation, circulation and vorticity, Vortex motion;



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UNIT-III

Dynamics of Fluid Flow: Euler's equation and its application, Bernoulli's equation and its application, Venturimeter, Orifice meter and nozzle, siphon, Flow through orifices (Measurement of Discharge, Measurement of Time), Flow through Mouthpieces, Flow over Notches,

UNIT-IV

Flow Through Pipes: Pipe flow, minor and major hydraulic losses through pipes, fluid friction, Darcy Weisbach equation of loss of head in pipes, hydraulic gradient and total energy line,

Flow Through Open Channel: Chezy's formula for loss of head in pipes, flow through simple and compound pipes, Chezy's equation, Bazin's formula, Kutter's Manning's formula, Moody's diagram.

UNIT-V

Dimensional Analysis and Similitude: Rayleigh's method and Buckingham's 'Pi' theorem, types of similarities, dimensional analysis, dimensionless numbers. Introduction to fluid machinery - positive displacement.

Text Books:

1. Fluid Mechanics and Fluid Power Engineering, 2004 by D.S. Kumar, S.K. Kataria & Sons
2. Fluid Mechanics and Hydraulic Machines, 2010 by R.K. Bansal, Laxmi Publications
3. Fluid Mechanics and Hydraulic Machines, 1998 by R.K. Rajput, S. Chand & Co.
4. Fluid Mechanics, 2016 by Frank. M. White, McGraw Hill Publishing Company Ltd.

Reference Books:

1. Khurmi, R .S. 1970. A Text Book of Hydraulics, Fluid Mechanics and Hydraulic Machines S Chand & Company Limited, New Delhi.
2. Modi P M and Seth S.M.1973. Hydraulics and Fluid Mechanics. Standard Book House, Delhi.
3. Chow V T 1983. Open Channel Hydraulics. McGraw Hill Book Co., New Delhi.
4. LalJagadish 1985. Fluid Mechanics and Hydraulics. Metropolitan Book Co.Pvt. Ltd., Delhi.

List of Experiments:

1. Study of manometers and pressure gauges.
2. Verification of Bernoulli's theorem.
3. Determination of metacentric height of a laboratory ship.
4. Determination of co-efficient of discharge of venturimeter.



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5. Determination of co-efficient of discharge of rectangular notch.
6. Determination of co-efficient of discharge of triangular notch.
7. Determination of co-efficient of discharge of mouthpiece.
8. Determination of co-efficient of discharge, co-efficient of velocity and co-efficient of contraction.
9. Determination of co-efficient of friction in pipe line.
10. Determination of Manning's roughness co-efficient in an open channel.
11. Determination of Chezy's roughness co-efficient in an open channel.
12. Discharge measurement through orifice.
13. Measurement of discharge in an open channel.
14. Discharge measurement through weirs.
15. Study of various types of pumps.
16. Visit to pump testing laboratory.



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							THEORY			PRACTICAL	
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
BTAE204	DCS	STRENGTH OF MATERIALS	1	0	1	2	50	30	0	15	5

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.

Course Objectives (CEOs):

1. To gain knowledge of different types of stresses, strain and deformation induced in the mechanical components due to external loads.
2. To study the distribution of various stresses in the mechanical elements such as beams, Riveted and welded connections etc.
3. To study effect of various loading conditions of Struts and columns.

Course Outcomes (COs):

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

1. Define and memorize mechanical properties of material & select appropriate material for a given working Conditions.
2. Explain Slope and deflection of beams using integration techniques, moment area theorems and conjugate beam method
3. Design of Columns and Struts.
4. Justify Stability of masonry dams.
5. Calculate and design Riveted and welded connections using the fundamental concepts of stress, strain and elastic behavior of materials.
6. Analysis of statically intermediate beams, Propped beams, Fixed and continuous beam analysis using superposition, three moment equation and moment distribution methods.

Syllabus

Unit – 1

Slope and deflection of beams using integration techniques, moment area theorem and Conjugate beam method.



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Unit - II

Columns and Struts:

Design of Columns: Classification of Columns, Boundary conditions, effective length, slenderness ratio, Design and strength of Columns, Design of axially loaded Columns (Excluding Built up sections)

Design of struts: Continues and Discontinues strut for given end conditions for axial load only.

Unit - III

Stability of masonry dams:

Types of Masonry dams, solid gravity masonry dam, hollow gravity masonry dam. Earth pressure, Timber dams, Theory of earth pressure.

Unit - IV

Riveted and welded connections:

Riveted Connections: Introduction, Objectives, Types of Rivets, Types of Riveted Joints Nomenclature, Welding Connections: Introduction, advantages of welding, types of joints,

Unit – V

Analysis of statically intermediate beams, Propped beams, Fixed and continuous beam analysis using superposition, three moment equation and moment distribution methods.

Text Books:

1. Khurmi R.S. 2001. Strength of Materials S. Chand & Co., Ltd., New Delhi.
2. Junarkar S.B. 2001. Mechanics of Structures (Vo-I). Choratar Publishing House, Anand.
3. Ramamrutham S. 2005. Strengths of Materials. Dhanpat Rai and Sons, Nai Sarak, New Delhi.

Reference Books:

1. Strength of Materials, Subramanyam, Oxford University Press, Edition 2005

List of Practical's:

To perform the tension test on metal specimen (M.S., C.I.), to observe the behavior of materials under load, to calculate the value of E, ultimate stress, permissible stress, percentage elongation etc. and to study its fracture;

1. To perform the compression test on; Concrete cylinders & cubes, C.I., M.S. & Wood specimens and to determine various physical and mechanical properties;



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2. To perform the bending test on the specimens; M.S. Girder, Wooden beam, Plain concrete beams & R.C.C. beam, and to determine the various physical and mechanical properties;
3. To determine Young's modulus of elasticity of beam with the help of deflection produced at centre due to loads placed at centre & quarter points;
4. To study the behavior of materials (G.I. pipes, M.S., C.I.) under torsion and to evaluate various elastic constants;
5. To study load deflection and other physical properties of closely coiled helical spring in tension and compression;
6. To perform the Rockwell, Vicker's and Brinell's Hardness tests on the given specimens;
7. To perform the Drop Hammer Test, Izod Test and Charpy's impact tests on the given specimens;
8. To determine compressive & tensile strength of cement after making cubes and briquettes;
9. To measure workability of concrete (slump test, compaction factor test);
10. To determine voids ratio & bulk density of cement, fine aggregates and coarse aggregates;
11. To determine fatigue strength of a given specimen;
12. To write detail report emphasizing engineering importance of performing tension, compression, bending, torsion, impact and hardness tests on the materials.



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							THEORY			PRACTICAL	
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
BTAE205	DCS	WORKSHOP TECHNOLOGY AND PRACTICES	1	0	2	3	50	30	0	15	5

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.

Course Objectives:

To paraphrases with (A) workshop technology, Machine tools like Lathe shaper, Milling and drilling (B) Carpentry shop, fitting shop, (C) welding and casting.

Course Outcomes:

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

1. Student would be able to understand the need of workshop, technology related to it, and industrial safety and precautions.
2. Student would be able to use carpentry tools, analyses various wood joints and their properties.
3. Students would be able to use fitting tools to make various shapes and design.
4. Student would be able to recognize various welding techniques and their needs.
5. Students would be able to design various shapes by using casting technologies.

Syllabus:

UNIT I

Carpentry Shop Carpentry: Introduction to various carpentry tools, materials, types of wood and their characteristics and Processes or operations in wood working; Introduction to Smithy tools and operations.

UNIT II

Welding Shop Welding: Introduction to welding, types of welding, Oxyacetylene gas welding, types of flames, welding techniques and equipment. Principle of arc welding, equipment and tools.

UNIT III

Casting: Pattern making and sand casting, Pattern materials, Types of pattern, Pattern allowances. Classification of casting, sand casting, die casting.



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UNIT IV

Lathe: Classification, constructional details of center lathe, Main accessories and attachments. Main operations and tools used on center lathes.

Shapers: Types of shapers, Constructional details of standard shaper. Work holding devices, shaper tools and main operations.

UNIT V

Drilling :Types of drilling machines. Constructional details of pillar types and radial drilling machines. Work holding and tool holding devices. Main operations. Twist drills, drill angles and sizes.

Milling: Types and classification. Constructional details and principles of operation of column and knee type universal milling machines. Plain milling cutter. Main operations on milling machine.

Text Books:

1. Hazra, Choudari S K and Bose S K. 1982. Elements of Workshop technology (Vol. I and II).Media Promoters and Publishers Pvt. Ltd., Mumbai.
2. Chapman W A J. 1989. Workshop Technology (Part I and II). Arnold Publishers (India) Pvt. Ltd., AB/9 Safdarjung Enclave, New Delhi.
3. Raghuwamsi B S. 1996. A Course in Workshop Technology (Vol. I and II). Dhanpat Rai and Sons, 1682 Nai Darak, New Delhi.

List of Practical's:

Preparation of simple joints: Cross half Lap joint and T-Halving joint; Preparation of Dovetail joint, Mortise and tenon joint; Jobs on Bending, shaping etc.; Jobs on Drawing, Punching, Riveting. Introduction to tools and measuring instruments for fitting; Jobs on sawing, filing and right angle fitting of MS Flat; Practical in more complex fitting job; Operations of drilling,, reaming, and threading with tap and dies; Introduction to tools and operations in sheet metal work; Making different types of sheet metal joints using G.I. sheets. Introduction to welding equipment, processes tools, their use and precautions; Jobs on ARC welding – Lap joint, butt joint; T-Joint and corner joint in Arc welding; Gas welding Practice – Lab, butt and T-Joints; Introduction to metal casting equipment, tools and their use; Mould making using one-piece pattern and two pieces pattern; Demonstration of mould making using sweep pattern, and match plate patterns; Introduction to machine shop machines and tools; Demonstration on Processes in machining and use of measuring instruments; Practical jobs on simple turning, step turning; Practical job on taper turning, drilling and threading; Operations on shaper and planer, changing a round MS rod into square section on a shaper; Demonstration of important operations on a milling machine, making a plot, gear tooth forming and indexing; Any additional job.



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							THEORY			PRACTICAL	
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
BTAE206	DCS	THEORY OF MACHINES	2	0	0	2	50	40	10	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.

Course Educational Objectives (CEOs):

This course provides comprehensive knowledge of (A) Mechanism and machine (B) Kinematics of plane motion, (C) Gears and Gear Train (D) Flywheel and Governors, (E) Drive, friction and clutches.

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 define systematically design and develop mechanisms to perform a specified task and demonstrate an understanding of the concepts of various mechanisms and pairs.
2. Students will be able to do the velocity and acceleration analysis of simple mechanisms.
3. Students will be able demonstrate an understanding of principle of gears and gear trains.
4. Students will be able to explain effectively present written, oral, and graphical solutions to design problems & develop ability to come up with innovative ideas and design a layout of flywheel and governors for specified motion.
5. Students will be able to synthesis belt drives, chain drives, friction and clutches.

Syllabus

Unit - I

Mechanisms and Machines: Elements, links, pairs, kinematics chain, and mechanisms. Classification of pairs and mechanisms, lower and higher pairs, four bar chain, slider crank chain and their inversions.



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Motion: Determination of velocity and acceleration using graphical (relative velocity and acceleration) method, Instantaneous centers.

Unit - II

Gears and Gear Trains: Gears and their types of gears. Law of gearing, velocity of sliding between two teeth in mesh. Involute and cycloidal profile for gear teeth. Spur gear, nomenclature, interference and undercutting. Introduction to helical, spiral, bevel and worm gear. Simple, compound, reverted, and epicyclic trains. Determining velocity ratio by tabular method.

Unit - III

Flywheel: Turning moment diagrams, coefficient of fluctuation of speed and energy, weight of flywheel, flywheel applications.

Governors: Types of governors. Constructional details and analysis of watt, porter, proell governors. Effect of friction, controlling force curves. Sensitiveness, stability, hunting, iso-chronism, power and effort of a governor.

Balancing: Static and dynamic balancing. Balancing of rotating masses in one and different planes.

Unit - IV

Belt and Chain Drives: Belt drives, types of drives, belt materials. Length of belt, power transmitted, velocity ratio, belt size for flat and V belts. Effect of centrifugal tension, creep and slip on power transmission, chain drives.

Unit - V

Friction and Clutches: Types of friction, laws of dry friction. Friction of pivots and collars. Single disc, multiple disc, and cone clutches. Rolling friction, anti friction bearings.

Text Books:

1. Khurmi R S and Gupta J K. 1994. Theory of Machines. Eurasia Publishing House Pvt. Ltd., Ram Nagar, New Delhi.
2. Rattan S B. 1993. Theory of Machines. Tata McGraw Hill Publishing Co. Ltd., 12/4 Asaf Ali Road, New Delhi.



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Reference Books:

1. Bevan Tomas. 1984. Theory of Machines. CBS Publishers and Distributors, Delhi.
2. Ballaney P L. 1985. Theory of Machines. Khanna Publishers, 2-B Nath Market, Nai Sarak, Delhi.
3. Rao J S and Dukkippatti R V. 1990. Mechanisms and Machine Theory. Wiley astern Ltd., New Delhi.
4. Lal Jagdish. 1991. Theory of Mechanisms and Machines. Metropolitan Book Co. Pvt.Ltd., 1Netaji Subash Marg, New Delhi..



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SEMESTER II

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*
BTCSAE101	ODS	WEB DESIGNING AND INTERNET APPLICATIONS	1	0	1	2	50	30	0	15	5

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.

Course Objectives:

1. Students will use a variety of design software to organize, create, publish, and manage a web site.
2. This course also puts emphasis on basic concepts of web design
3. Provide you the conceptual and technological developments in the field of Internet and web designing.
4. Course content includes creating a variety of graphic elements including video, animations, rollover effects, backgrounds, and page images

Course Outcomes:

At the end of the course the students will be able to: -

1. Review the current topics in Web & Internet technologies.
2. Describe the basic concepts for network implementation.
3. Learn the basic working scheme of the Internet and WWW.
4. Understand fundamental tools and technologies for web design.
5. Specify design rules in constructing web pages and site.

Syllabus:

Basic principles in developing a web designing, Planning process, Five Golden rules of web designing, Designing navigation bar, Page design, Home Page Layout, Design Concept. Basics in Web Design,

Brief History of Internet, World Wide Web, creation of a web site, Web Standards, Audience requirement. Introduction to Java Script, variables & functions, Working with alert, confirm and prompt, Connectivity of Web pages with databases; Project.

Text Books:

1. Jennifer Niederst Robbins. Developing web design latest edition.
2. Frain and Ben. Responsive Web Design with HTML5.
3. Nicholas c.Zakas. Java Script for Web Developers.



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B.TECH AGRICULTURAL ENGINEERING

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4. George Q. Huang, K. L Mak. Internet Applications in Product Design and Manufacturing. ISBN:3540434658.

Reference Books:

1. Steven M. Schafer, "HTML, XHTML, and CSS Bible", 5ed, Wiley India
2. John Duckett, "Beginning HTML, XHTML, CSS, and JavaScript", Wiley India
3. Ian Pouncey, Richard York, "Beginning CSS: Cascading Style Sheets for Web Design", Wiley India
4. Achyut S. Godbole, Atul Kahate, Web Technologies, ISBN: 9781259062681, TMH

List of Practical:

1. Study of Dreamweaver tool.
2. Study of basics of flash animation tool.
3. Design a Web Page, Insert an image on to the web page such that image is of height 300 and width 300 pixels. The image should have an ALT text in it.
4. Create a Web page that holds a bulleted list of the names of your friends. Make sure that the bullets are in plain circle.
5. Create a Frame which would hold both the web page that was created earlier. The frame should be split row-wise into equal halves.
6. Create a Web Page to display the marks you got in all subjects of last semester using table.
7. Create a Form having two boxes with labels as First Name and Last Name. The User should not be allowed to enter the names directly in the text boxes. The input has to be given in the prompt box and then entered values should be given in the textboxes.
8. Create a Web Page that has a button in the center of the page. Using mouse events change the Message in the statusbar.
9. Design a Web page that accepts Username and Password. Opens a new window when the password corresponds to a particular value is set by the developer
10. Design a Web page that consists of 2 text boxes. When the page is first loaded set the focus to the first textbox. The user should not be allowed to leave the box unless enters a value in it.



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SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM	MST	T/A	END SEM	T/A				
BTMAAE201	BS	Engineering Mathematics -II	50	30	0	15	5	2	-	1	3

Course Objective

To introduce the students with the fundamentals of the Differential Equations, Calculus of the Complex Variable and Fourier Analysis.

Course Outcomes

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

- 1. Solve the fundamental problems of the ordinary differential equations.*
- 2. Understand and apply the basics of the calculus of the complex variables.*
- 3. Apply the concepts of the Fourier analysis.*
- 4. Find the solution of the PDE.*

Course Content:

UNIT – I

Ordinary differential equations: Exact and Bernoulli's differential equations, equations reducible to exact form by integrating factors, equations of first order and higher degree, Clairaut's equation,

UNIT– II

Differential equations of higher orders: Methods of finding complementary functions and particular integrals, method of variation of parameters, Cauchy's and Legendre's linear equations, simultaneous linear differential equations with constant coefficients, series solution techniques, Bessel's and Legendre's differential equations.

UNIT – III

Functions of a Complex variable: Limit, continuity and analytic function, Cauchy-Riemann equations, Harmonic functions.



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UNIT – IV

Infinite series and its convergence, periodic functions, Fourier series, Euler's formulae, Dirichlet's conditions, functions having arbitrary period, even and odd functions, half range series, Harmonic analysis. Fourier Sine and Cosine Series, Fourier series for function having period $2L$, Elimination of one and two arbitrary function.

UNIT – V

Partial differential equations: Formation of partial differential equations Higher order linear partial differential equations with constant coefficients, solution of non-linear partial differential equations, Charpit's method, application of partial differential equations (one dimensional wave and heat flow equations), Laplace Equation.

Practical:

Tutorials on solution of ordinary differential equations of first and higher orders. Series solutions of differential equations. Bessel's and Legendre's differential equations, Convergence of infinite series. Fourier series, harmonic analysis, analytical functions, Cauchy-Riemann 164 Report of the ICAR Fifth Deans' Committee equations, harmonic functions, Solution of partial differential equations, Application of partial differential equations.

Suggested Readings:

- [1] Narayan Shanti. 2004. A Text Book of Matrices. S. Chand and Co. Ltd. New Delhi.
- [2] Grewal B S. 2004. Higher Engineering Mathematics. Khanna Publishers Delhi.
- [3] Ramana B V. 2008. Engineering Mathematics. Tata McGraw-Hill. New Delhi.