



Shri Vaishnav Vidyapeeth Vishwavidyalaya
B.TECH AGRICULTURAL ENGINEERING
SEMESTER III

COURSE CODE	CATEGORY	COURSE NAME	L	P	CREDITS	TEACHING & EVALUATION SCHEME				
						THEORY			PRACTICAL	
						END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
BTAE301	DCS	Principles of Horticultural Crops and Plant Protection	1	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 Objective: To study importance, branches, scope and plant protection of horticultural crops

Course Outcomes:

1. Student will be able to understand Horticultural plant propagating method.
2. Student will be able to understand raising of Horticultural crops and plant protection measures.

Unit: 1:

Scope of horticultural. Soil and climatic requirements for fruits, vegetables and floriculture crops, improved varieties,

Unit:2:

Criteria for site selection, layout and planting methods, nursery raising, commercial varieties/hybrids, sowing and planting times and methods, seed rate and seed treatment for vegetable crops;

Unit: 3:


macro and micro propagation methods, plant growing structures, pruning and training, crop coefficients,

Unit: 4:

water requirements and critical stages, fertilizer application, fertigation, irrigation methods, harvesting, grading and packaging, post harvest practices,

Unit: 5:

Garden tools, management of orchard, Extraction and storage of vegetables seeds. Major pests and diseases and their management in horticulture crops.


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Practical:

Judging maturity time for harvesting of crop; Study of seed viability and germination test; Identification and description of important fruits, flowers and vegetable crops; Study of different garden tools; Preparation of nursery bed; Practices of pruning and training in some important fruit crops, visit to commercial greenhouse/ polyhouse; cultural operations for vegetable crops (sowing, fertilizer application, mulching, irrigation and weed control); seed extraction techniques; identification of important pests and diseases and their control.

Suggested Readings

1. Bansal. P.C. 2008. Horticulture in India. CBS Publishers and Distributors, New Delhi.
2. Saraswathy, S., T.L. Preethi, S. Balasubramanyan, J. Suresh, N. Revathy and S. Natarajan. 2007. Postharvest management of Horticultural Crops. Agrobios Publishers, Jodhpur.
3. Arjunan, G., Karthikeyan, G, Dinakaran, D. and Raguchander, T. 1999. Diseases of Horticultural Crops. AE Publications, Coimbatore.
4. Sharma Neeta and Mashkoor Alam. 1997. Postharvest diseases of Horticultural crops. International Book publishing Co. UP.


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BTAE 302	DCS	Communication Skills and Personality Development	1	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. The students will be able to familiarize with Communication Skills and Personality Development.
2. To learn the Structural and functional grammar.
3. To develop skills for reading and comprehension of general and technical articles.
4. To develop knowledge, skills, and judgment around human communication that facilitates their ability to work collaboratively with others.

Course Outcomes:

1. Students will be able to understand the concepts of verbal and non-verbal communication.
2. Students will be able to speak English grammatically correct.
3. Students will be able to write technical articles.
4. Students will be able to use current technology related to the communication field.
5. Students will be able to demonstrate critical and innovative thinking.

UNIT-I

Communication Skills: Structural and functional grammar; meaning and process of communication, verbal and non-verbal communication;

UNIT-II

Listening and note taking, writing skills, oral presentation skills; field diary and lab record; indexing, footnote and bibliographic procedures.

UNIT-III


Reading and comprehension of general and technical articles, precis writing, summarizing, abstracting; case study .

UNIT-IV

Presentation skills, steps in creating a presentation, methods of communicating information individual and group presentations, impromptu presentation, public speaking.

UNIT-V

Group discussion, Types of group discussion, Factual topic, controversial topic, abstract topic points to remember in group discussion, Organizing seminars and conferences.


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Practical's:


Listening and note taking, writing skills, oral presentation skills; field diary and lab record; indexing, footnote and bibliographic procedures. Reading and comprehension of general and technical articles, precis writing, summarizing, abstracting; individual and group presentations.

Text Books:

1. Balasubramanian T. 1989. A Text book of Phonetics for Indian Students. Orient Longman, New Delhi.
2. Balasubramanyam M. 1985. Business Communication. Vani Educational Books, New Delhi.

Reference Books:

1. Naterop, Jean, B. and Rod Revell. 1997. Telephoning in English. Cambridge University Press, Cambridge.
2. Mohan Krishna and Meera Banerjee. 1990. Developing Communication Skills. Macmillan India Ltd. New Delhi.
3. Krishnaswamy, N and Sriraman, T. 1995. Current English for Colleges. Macmillan India Ltd. Madras.
4. Narayanaswamy V R. 1979. Strengthen your writing. Orient Longman, New Delhi.
5. Sharma R C and Krishna Mohan. 1978. Business Correspondence. Tata Mc Graw Hill publishing Company, New Delhi


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						THEORY			PRACTICAL	
						END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
BTAE303	DCS	Design of Structures	1	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. To understand basic characteristics of Loads and use of BIS Codes.
2. To study design and drawing of different structures with their applications.
3. To understand the design parameters in structural steel members in tension, compression and bending loading conditions.
4. To develop the devices and instruments which provide the knowledge for effectively apply and analyze external parameters.

Course Outcomes:

1. Calculate various types of loads coming on the structures.
2. Students will be able to apply and demonstrate different Design parameters.
3. Students will be able describe main elements of technical systems designed for Analysis and design of different reinforced sections.
4. Students will be able to interpret advantages and disadvantages of designing, drawing and analysis of different structures and sections.
5. Students will be able explain the correlation between different operational parameters.

SYLLABUS:

UNIT I

Type of Loads on Structures and Load combinations. Use of BIS Codes, Design of connections. Connections: Bolted connections – bearing type, behavior of bolted joints, Design strength of ordinary & HSFG bolts. Welded connections: Fillet and Butt weld, design of simple connections such as lap and butt joints, truss joint connections.

UNIT II

Types of Structural steel, Mechanical Properties of structural steel- Indian structural steel products- Steps involved in the Design Process -Steel Structural systems and their Elements Loading standards and Specifications – Concept of Allowable Stress Method, and Limit State Design Methods for Steel structures. Design of structural steel members in tension, compression and bending.

UNIT III

Design of steel roof truss. Various types of roof truss, pitch of roof truss, spacing of trusses, spacing of purlins, connection between purlin and roof covering, joint details of roof trusses, loading for roof truss, weight of roof truss, wind loads, snow loads, combination of loads, design of various elements of truss


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UNIT IV

Analysis and design of singly and doubly reinforced sections, Shear, Bond and Torsion.

UNIT V

Design of Flanged Beams, Slabs, Columns, Foundations, Retaining walls and Silos.

Reference Books:

1. Junarkar, S.B. 2001. Mechanics of Structures Vol. I Charotar Publishing Home, Anand.
2. Khurmi R. S. 2001. Strength of materials. S. Chand & Company Ltd., 7361, Ram Nagar, New Delhi – 110055.
3. Kumar Sushil 2003. Treasure of R.C.C. Design. R.K. Jain. 1705-A, Nai Sarak , Delhi-110006, P.B.1074.

List of Practical's:

1. Design and drawing of single reinforced beam,
2. Design and drawing of double reinforced beam,
3. Design and drawing of steel roof truss;
4. Design and drawing of one way slab,
5. Design and drawing of two way slabs,
6. Design and drawing of RCC building;
7. Design and drawing of Retaining wall.
8. To measure workability of cement by slump test


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BTAE304	DCS	Principles of Agronomy	2	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 Objective: To study the principles of Agronomy

Course Outcomes:

1. Student will be able to understand the importance of tillage and relevance of weather parameters in agriculture
2. Student will be able to understand weed, crop growth and development in terms of agronomic practices.

Unit: 1: Introduction and scope of agronomy. Classification of crops, Principles of tillage, tith and its characteristics.

Unit: 2: Effect of different weather parameters on crop growth and development. Crop seasons. Methods, time and depth of sowing of major field crops.

Unit: 3: Methods and time of application of manures and fertilizers. Organic farming-Sustainable agriculture.

Unit: 4: Soil water plant relationship, crop coefficients, water requirement of crops and critical stages for irrigation,

Unit: 5: Weeds and their control, crop rotation, cropping systems, Relay cropping and mixed cropping.

Practical:

Identification of crops and their varieties, seeds, manures, fertilizers and weeds; Fertilizer Application methods; Different weed control methods; Practice of ploughing, Practice of Puddling, Practice of sowing.

Suggested Readings

1. Reddy Yellamanda T and Shankar Reddy G H. 1995. Principles of Agronomy. Kalyani Publishers Ludhiana.
2. William L Donn. 1965. Meteorology. McGraw-Hill Book Co. New York.
3. Arnon L. 1972. Crop Production in Dry Regions. Leonard Hill Publishing Co. London.
4. Yawalkar K S and Agarwal J P. 1977. Manures and Fertilizers. Agricultural Horticultural


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Publishing House, Nagpur.

5. Gupta O P. 1984. Scientific Weed Management in the Tropics and Sub- Tropics. Today and tomorrow's Printers and Publishers. New Delhi.
6. Rao V S. 1992. Principles of Weed Science. Oxford and IBH Publishing Co. Ltd. New Delhi.


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						THEORY			PRACTICAL	
						END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
BTAE305	DCS	Thermodynamics, Refrigeration and Air Conditioning	2	1	3	50	30	0	15	5

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

(A) To gain knowledge of Basic Concepts of thermodynamics. (B) To study of First law of Thermodynamics. (C) To gain knowledge of Second law of thermodynamics. (D) Refrigeration (E) Vapour Compression mechanism. (F) Properties of Moist Air. (G) Air conditioning.

Course Outcomes:

After learning the course, the students should be able to

1. Understand basic terms used in thermodynamics.
2. Understand laws of thermodynamics and its applications.
3. Understand the properties of gas power cycles.
4. Understand basic concepts of refrigeration.
5. Understand Vapour compression mechanism.
6. Understand air-conditioning system.

Syllabus:

UNIT I


Basic Concepts of Thermodynamics: Thermodynamics properties, closed and open system, flow and non-flow processes, gas laws, laws of thermodynamics, internal energy. Application of first law in heating and expansion of gases in non-flow processes. First law applied to steady flow processes.

UNIT II

Gas Power cycles: Carnot cycle, Carnot theorem. Entropy, physical concept of entropy, change of entropy of gases in thermodynamics process. Otto, diesel and dual cycles.

UNIT III

Basic Concepts of Refrigeration: Principles of refrigeration - units, terminology, production of low temperatures, air refrigerators working on reverse Carnot cycle and Bell Coleman cycle. Vapour refrigeration mechanism, P-V, P-S, P-H diagrams, vapor compression cycles, dry and wet compression, super cooling and sub cooling. Vapour absorption refrigeration system. Common refrigerants and their properties. Design calculations for refrigeration system. Cold storage plants.


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UNIT IV

Properties of Moist Air: Thermodynamic properties of moist air, perfect gas relationship for approximate calculation, adiabatic saturation process, wet bulb temperature and its measurement, psychometric chart and its use, elementary psychometric process.

UNIT V

Air conditioning : Air conditioning principles ,Type and functions of air conditioning, physiological principles in air conditioning, air distribution and duct design methods, fundamentals of design of complete air conditioning systems, humidifiers and dehumidifiers, cooling load calculations, types of air conditioners and applications.

Text Books:

1. Khurmi R S. 1992. Engineering Thermodynamics. S Chand and Co. Ltd., Ram Nagar, New Delhi.
2. Nag P K.1995. Engineering Thermodynamics. Tata McGraw Hill Publishing Co.Ltd., 12/4 Asaf Ali Raod, New Delhi.

Reference Books:

1. Mathur M L and Mehta F S. 1992. Thermodynamics and Heat Power Engineering. Dhanpat Rai and Sons 1682 Nai Sarak, New Delhi.
2. Ballney P. L. 1994. Thermal Engineering. Khanna Publishers, New Delhi.
3. Kothandaraman C P Khajuria P R and Arora S C. 1992. A Course in Thermodynamics and Heat Engines. Dhanpet Rai and Sons, 1682 Nai Sarak, New Delhi.

List of Practical's:

1. Prepare tutorials on thermodynamic air cycles.
2. Study and application of P-V and T-S chart in refrigeration cycles, P-H chart (or) Mollier diagram in refrigeration.
3. Numerical on air refrigeration cycle systems.
4. Numerical on vapour compression cycle refrigeration system.
5. Study of domestic water cooler.
6. Study of domestic household refrigerator.
7. Study of absorption type solar refrigerationsystem.
8. Study cold storage for fruit and vegetables, freezing load and time calculations for food materials.
9. Study of window air conditioner.
10. Numerical on design of air conditioning systems.
11. Study on repair and maintenance of refrigeration and air-conditioning systems.
12. Visit to chilling or ice making and cold storage plants.


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						THEORY			PRACTICAL	
						END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
BTAE306	DCS	MACHINE DESIGN	2	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 Objectives:

To study proper materials for different machine elements depending on their physical and mechanical properties and also gain design knowledge of the different types of elements and joints, Shaft, Spring, and gears used in the engineering applications, subject to various types of stresses.

Course Outcomes:

Student will be able to:

Understand the design concepts of various machine elements.

Design the various types of springs.

Design the shafts and couplings.

Design the threaded and bolted joints.

Design the belt drive, gear, lead screw.

Understand the concepts of bearing lubrication and design the anti friction bearings.

Syllabus:

UNIT I

Meaning of design, Phases of design, design considerations. Common engineering materials and their mechanical properties. Types of loads and stresses, theories of failure, factor of safety, selection of allowable stress. Stress concentration. Elementary fatigue and creep aspects.

UNIT II

Cotter joints, knuckle joint and pinned joints, turnbuckle. Design of welded subjected to static loads. Design of threaded fasteners subjected to direct static loads, bolted joints loaded in shear and bolted joints subjected to eccentric loading.

UNIT III

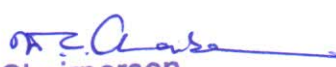
Design of shafts under torsion and combined bending and torsion. Design of keys. Design of muff, sleeve, and rigid flange couplings.

UNIT IV

Design of helical and leaf springs. Design of flat belt and V-belt drives and pulleys.

UNIT V

Design of gears. Design of screw motion mechanisms like screw jack, lead screw, etc. Selection of anti-friction bearings.


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Text Books:

1. Jain R K. 2013. Machine Design. Khanna Publishers, 2-B Nath Market, Nai Sarak, New Delhi.
2. Khurmi R S and Gupta J K. 2014. A Text Book of Machine Design. S. Chand & Company Ltd.,
3. New Delhi

Reference Books:

1. Design of Machine Elements, V.B. Bhandari, Tata McGraw Hill Co.
2. Machine Design-Sharma and Agrawal, S.K. Kataria & Sons.
3. Machine Design, U C Jindal, Pearson Education.
4. Design of Machine Elements, Sharma and Purohit, PHI.
5. Design of Machine Elements-M.F. Spott, Pearson Education
6. Machine Design-Maleev and Hartman, CBS Publishers.


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