

**SATAVAHANA UNIVERSITY : KARIMNAGAR**

**GENERIC ELECTIVE PAPER FOR UG 5<sup>th</sup> SEMESTER FOR 2021-22 (2019-20 ADMITTED STUDENTS)**

S.No	5 <sup>th</sup> SEMESTER		
01	GE-5	<b>B.Sc. (Life Science)</b>	A) WATER RESOURCE MANAGEMENT
		B) INTEGRATED PEST MANAGEMENT	
		C) MICRO BIOLOGY AND HUMAN HEALTH	
		<b>B.Sc. (Physical Science)</b>	A) MATHEMATICS FOR ECONOMICS AND FINANCE
		B) RENEWABLE ENERGY & ENERGY HARVESTING	
		C) CHEMISTRY OF COSMETICS, FOOD PROCESSING, DRUGS AND PHARMACEUTICS	
		<b>B.Com., B.Com(CA)</b>	A) BUSINESS ECONOMICS
		<b>BBA, BBA(CA)</b>	A) MOBILE COMMERCE
		<b>BA</b>	A) TELANGANA ECONOMY
			B) INDIAN NATIONAL MOVEMENT
			C) GOOD GOVERNANCE



**DIRECTOR, ACADEMIC AUDIT CELL**

*Director*  
Academic Audit Cell  
Satavahana University, Karimnagar



**REGISTRAR**  
**REGISTRAR**  
SATAVAHANA UNIVERSITY  
KARIMNAGAR-505 001

# WATER RESOURCES MANAGEMENT

(4 hrs/week) (Taught by ant Science Dept) (Credits:4) (Marks:100)

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## UNIT-I:

Introduction to water resources management, different types of water resources, water resources and its importance, Global distribution of water. Hydrological cycle, Conservation of water, recycling of water.

## Unit-II:

Rain water harvesting, methods of roof top rain water harvesting in urban setting: Direct method - Storing rain water in tanks for direct use; indirect methods - Recharge pits, bore wells/dug wells, Recharge trenches. Over use of surface and ground water and control measures.

## UNIT-III:

Importance of water shed and water shed management, Rain water harvesting in rural setting: Check dams, percolation tanks, gabion structure, continuous contour trenches, staggered contour trenches, farm ponds. Surface water and ground water pollution, control measures.

## UNIT-IV :

Mission Bhagiratha: Telangana government water grid project for drinking water supply - aims and objectives and method of implementation. Mission Kakatiya: Telangana government project for the restoration of minor irrigation tanks, aims and objectives and method of implementation.

## Text books:

- 1) Water Resources, Conservation and Management by Chatterjee, S.N.
- 2) Groundwater hydrology by Todd
- 3) Watershed management by J.V.S.Murthy
- 4) Applied Hydrogeology by Fetter.



**B.Sc. ZOOLOGY SYLLABUS UNDER CBCS 2019-20**

**B.Sc. ZOOLOGY III YEAR**

**SEMESTER – V**

**PAPER – V (GE-I): INTEGRATED PEST MANAGEMENT**

**Instructions:** 4 hr per week

**No. of period:** 60

**No. of credits:** 4

**UNIT-I: Pest**

**(15 Periods)**

- 1.1 Introduction, History and origin
- 1.2 Definition of pest and its ecology
- 1.3 Pest, population dynamics
- 1.4 Economic injury level (EIL), Economic threshold
- 1.5 Pest surveillance

**UNIT-II: Integrated Pest Management**

**(15 Periods)**

- 2.1 Concepts of IPM
- 2.2 Components of IPM
- 2.3 Major IPM strategies
- 2.4 Strategies for IPM Mechanical, Physical, Cultural and Biological

**UNIT-III: Biological and Genetic Control**

**(15 Periods)**

- 3.1 Introduction and Principle
- 3.2 Bio control agents
- 3.3 Parasitoids, predators and pathogens (NPV, Bacteria, fungi and nematodes)
- 3.4 Merits and demerits
- 3.5 Genetic Control – sterile insect technique; sterile insect release method

**UNIT-IV: Chemical Control**

**(15 Periods)**

- 4.1 Classification of insecticides
- 4.2 Insecticide adjuvant and formulation
- 4.3 Chemical control with reference to organo chloride, organophosphate carbamates
- 4.4 Synthetic pyrethroids; fumigants; pheromones legal or regulatory control- Quarantine acts

**REFERENCES**

1. K.P.Srivastava: A Text Book of applied Entomology Vol.I&II. Kalyani Publishers New Delhi.
2. B.V.David and KumaraSwamy. Elements of Economic Entomology
3. B.V.David and KumaraSwamy. Elements of Economic Entomology
4. Pedigo, L.P. Entomology and Pest Management. Prentice-Hall, New Delhi
5. Pradhan, S. Insect Pests of Crops, National Book Trust, New Delhi
6. Agricultural Pests of India and South East Asia by Atloal A.S. Kalyani Publisher, New Delhi
7. Insect Pest of Crops by S. Pradhan, National Book Trust, New Delhi



**Dept. Microbiology: Osmania University**

**Proposed scheme for B.Sc Microbiology program under choice based credit system (CBCS)**

**With effect from 2020-21**

**Syllabus for B.Sc Microbiology**

**Code: BS, GE**

**B.Sc III year: V semester**

**Title: MICROBIOLOGY AND HUMAN HEALTH**

**4 HPW-credits-4**

**UNIT-1: INTRODUCTION**

Historic developments of Microbiology, contributions of Van Leeuwenhoek, Edward Jenner, Louis Pasteur, Robert Koch.

Types of microorganisms, Morphological characteristics of bacteria, Staining, cultivation methods of bacteria, Culture Media used for the growth of microorganisms.

**UNIT-2: MICROORGANISMS: GOOD AND BAD**

Microorganisms related to human health. Normal microbial flora, Human microbiome concept.

Bacterial disease: Typhoid, Tuberculosis, Syphilis

Viral diseases: Flu, SARS, MERS, SARS-CoV-2, HIV

Insect borne: Malaria and Dengue

**UNIT-3: IMMUNITY AND HEALTH**

Introduction to immune system; Understanding the terms: Disease, Infection, Pathogenicity, Prophylaxis, Host resistance, Innate immunity and acquired immunity, Epidemics, Endemics and Pandemics; Importance of probiotics and vaccines for human health

**UNIT-4: WASTE MANAGEMENT AND HEALTH HAZARDS**

Health hazards associated with dumpage of Industrial and Biomedical waste.

National and international guidelines for the disposal of waste. Guidelines of Central Pollution Control Board (CPCB). Safe disposal and pretreatment of wastes. Mechanical and chemical treatment of the waste. Autoclaving, incineration.

**References:**

1. Michael J. Pelczar, Jr. E.C.S.Chan, Noel R. Krieg Microbiology Tata McGraw- Hill Publisher.
2. Prescott. M.J., Harley, J.P. and Klein Microbiology 5<sup>th</sup> Edition, WCB McGrawHill, New York.
3. Madigan, M.T., Martinkl, J.M and Parker, J. Broch Biology of Microorganism, 9<sup>th</sup> Edition, MacMillan Press, England.
4. Dube, R.C, and Maheshwari, D.K. General Microbiology S Chand, New Delhi.
5. Ananthanarayan and Panikar. Text book of Microbiology. Universities Press.

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**B.Sc. (Physics)- III Year**  
**Semester – V**  
**Renewal energy & Energy harvesting**  
**(GE)**

**Total: 56 Hrs**  
**(4 Hrs / week)**

**Unit I: Principles of Solar Radiation and Collection (Qualitative only) (14Hrs)**

Non-renewable energy resources – Principles of power generation and transmission. A model of conventional thermal power plant. Advantages and disadvantages of conventional power plants. Role and potential of new and renewable sources, the solar energy option, environmental impact of solar power, physics of the sun, the solar constant, solar radiation on tilted surface, instruments for measuring solar radiation and sun shine, solar radiation data.

**Unit II: Solar Energy Storage and Applications (14Hrs)**

Solar energy collectors - Flat plate and concentration collectors, classification of concentration collectors and orientation, advanced collectors. Different sensible, latent heat and stratified storage, solar ponds. Solar Applications – solar heating/ cooling technique, solar distillation and drying, photovoltaic energy conversion.

**Unit III: Wind and Bio-Mass Energy (14Hrs)**

Resources and potentials, horizontal and vertical axis windmills, performance characteristics. Principles of Bio-Conversion, Energy from waste, types of bio-gas digesters, gas yield, combustion characteristics of bio-gas, utilization for cooking, LPG and CNG.

**Unit IV: Geothermal and Ocean Energy (14Hrs)**

Resources, types of wells, methods of harnessing the energy, potential in India. OTEC, principles of utilization, setting of OTEC plants, thermodynamic cycles. Tidal and wave energy, Potential and conversion techniques, mini-hydel power plants, land and their economics.

**Suggested Books:**

1. Non-Conventional Energy Sources - G.D Rai, Khanna Publishers
2. Renewable Energy Resources - Twidell & Wier, CRC Press ( Taylor & Francis)
3. Renewable energy resources - Tiwari and Ghosal, Narosa.
4. Renewable Energy Technologies - Ramesh & Kumar, Narosa
5. Non-Conventional Energy Systems - K Mittal, Wheeler
6. Renewable energy sources and emerging technologies - D.P. Kothari, K.C. Singhal.



Semester V  
Generic Elective (GE) Course - I (4 Credits)  
(for B.Sc. Non Chemistry/B.A/B.Com Students)  
Chemistry of Cosmetics, Food Processing, Drugs and Pharmaceuticals 60Hrs

**Unit-I: Chemistry of Cosmetics and Perfumes** 15 Hrs

A general study including preparation and uses of the following: Hair dye, hair spray, shampoo, sunscreen lotions, lipsticks, talcum powder, nail enamel, creams (cold, vanishing and shaving creams), antiperspirants and artificial flavours. Essential oils and their importance in cosmetic industries with reference to eugenol, geraniol, sandalwood oil, eucalyptus, 2-phenyl ethyl alcohol.

Demonstration experiments or illustration of experimental procedures through charts for the preparation of talcum powder, shampoo and vanishing cream. Chemistry and Applications of deodorants and antiperspirant - Aluminum, Zinc, Boric acid, Chloride and Sulphide.

**Unit-II: Food Processing and Food Adulteration** 15 Hrs

**Food processing:** Introduction, methods for food processing, additives and preservatives. Food processing- impact on nutrition,

**Food adulteration:** Adulterants in some common food items and their identification: Pulses, chilli powder, turmeric powder, milk, honey, spices, food grains and wheat flour, coffee powder, tea leaves, vegetable oil, ghee, ice creams, tomato sauce.

**Food Packaging:** Definition and function of packaging-Classification of packaging materials-different types of packaging materials such as glass, wood, metal, paper, wood, plastic etc., - advantages and disadvantages of each packaging material. Packaging materials and systems: corrugated fibre board boxes, shrink bundles and reusable packages. Effect of packaging materials on nutritive values of food.

**Food labelling:** Introduction, need and importance.

**Unit - III: General Characteristics of Drugs** 15Hrs

**Introduction:** Diseases – causes of diseases, Drug – definition and sources.

ADME of drugs (brief) – Absorption, distribution, drug metabolism (in liver), elimination (brief). Toxicity.

Examples (i) Zintac (Ranitidine, antacid) (ii) Paracetamol (antipyretic) (iii) Benadryl (Cough syrup). Characteristics of an ideal drug.

**Nomenclature of Drugs:** chemical name – generic name – trade name. Trade names for the given generic names – (i) Aspirin (ii) Amoxycillin (iii) Ciprofloxacin (iv) Paracetamol (v) Mebendazole

**Drug formulations:** Definition – need for conversion of drug into pharmaceutical (drug formulations) – Additives – diluents, binders, lubricants, antioxidants, flavourants, sweeteners, colourants, coating agents. Classification of Drug formulations: oral, parenterals and topical dosage forms – advantages and disadvantages.

(i) **Oral Dosage forms:** Tablets (Aspirin – analgesic; Ciprofloxacin - antibacterial). Capsules (Amoxycillin – antibiotic; Omeprazole-antacid). Syrups (B-complex syrup; Benadryl- Cough syrup).

*M. Manoj*

CHAIRMAN  
Board of Studies in Chemistry  
SATAVAHANA UNIVERSITY  
ARIMNAGAR- 505 001.



## **BA III Year**

### **Course-II: (A) Good Governance (GE)**

#### **Course Objective**

The word 'Governance' appears in diverse academic disciplines. At general level, governance refers to theories and issues of social coordination and the nature of all patterns of rule. The theories of governance have changed the understanding of various concepts of state and its institutions. New jargon of words emerged into the social science literature with different connotations. In this background, the present course is aimed to provide an in-depth understanding of the basic tenets and trends of Good Governance.

#### **Unit - I: Introduction**

- a) Meaning and Definitions of Governance
- b) Government and Governance
- c) Concepts of Good Governance

#### **Unit - II: Citizen and Governance**

- a) Rule of Law and Human Rights
- b) Accountability
- c) Participation

#### **Unit - III: Techniques of Good Governance**

- a) Openness and Transparency
- b) Citizen Charter
- c) Social Audit

#### **Unit - IV: Emerging Trends**

- a) Public and Private Governance
- b) Good Governance and Civil Society
- c) ICT and Good Governance

#### **References:**

- Bell, S., and Hindmoor, A. (2009) *Rethinking Governance: The Centrality of the State in Modern Society*. Cambridge: Cambridge University
- Bell, Stephen and Andrew Hindmoor. (2009) *Rethinking Governance: The Centrality of the State in Modern Society*. Cambridge: CUP.
- Bevir, Mark (2009). *Key Concepts in Governance*, Sage, London.
- Bevir, Mark, ed. (2010) *The Sage Handbook of Governance*. Thousand Oaks, CA: Sage
- Bovaird, Tony and Elke Löffler, eds. (2009) *Public Management and Governance*, Routledge.
- Farazmand, Ali and Jack Pinkowski, eds. (2006) *Handbook of Globalization, Governance, and Public Administration*. London: CRC/Taylor & Francis.
- Hajer, Maarten, and Hendrik Wagenaar (2003) "Introduction." In *Deliberative Policy Analysis*: Kjaer, A (2004) *Governance*. Cambridge, UK: Polity Press.
- Koolman, Jan ed. (1993) *Modern Governance: New Government-Society Interactions*. London: Sage.
- Koolman, Jan. (2003) *Governing as Governance*. London: Sage.





**SATAVAHANA UNIVERSITY**  
**KARIMNAGAR**

**SKILL ENHANCEMENT COURSE FOR  
UG 4<sup>th</sup> SEMESTER R19 NEW  
FOR 2019-20  
ADMITTED STUDENTS**

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**SATAVAHANA UNIVERSITY : KARIMNAGAR**

**SKILL ENHANCEMENT COURSE FOR UG 3<sup>rd</sup> & 4<sup>th</sup> SEMESTER FOR 2019-20 ADMITTED STUDENTS**

S.No	III-SEMESTER			S.NO	IV-SEMESTER		
1	<b>SEC-I</b>	Communication Skills <b>OR</b> Professional Skills		1	<b>SEC-3</b>	Leadership & Management Skills <b>OR</b> Universal Human Values	
2	<b>SEC-2</b>	B.Sc. (Physical Science)	A) Remedial Methods for Pollution, Drinking Water & Soil fertility	2	<b>SEC-4</b>	B.Sc. (Physical Science)	A) Basic Instrumentation
			B) Theory of Equations				B) Number Theory
			C) Electronic hardware and Networking				C) Chemistry of Cosmetics and Food Processing
			D) Python -I				D) Python -II
		B.Sc. (Life Science)	A) Bio fertilizers and Organic Farming			B.Sc. (Life Science)	A) Vermiculture
			B) Sericulture				B) Greenhouse Technology
			C) Immunological Techniques				C) Industrial Fermentations
			D) Hematology				D) Mushroom Cultivation
		B.Com., B.Com(CA)	A) Foundation of Digital Marketing & Web Design			B.Com., B.Com(CA)	A) Social Media Marketing
			B) Principals of Insurance				B) Practice of Life and General Insurance
		BBA, BBA(CA)	A) Foundation of Digital Marketing & Web Design			BBA, BBA(CA)	A) Social Media Marketing
			B) Basic Quality Management				B) Start Up Management
		BA	A) Rural Development			BA	A) Entrepreneurship and Development
			B) Office Processes				B) Technology & Office Administration
			C) Project Planning and Report Writing				C) NGO Management
						D) Historical and Cultural Tourism	D) Archives and Museums

*Udh*  
26/2/21

**DIRECTOR, ACADEMIC AUDIT CELL**

*T. Murug*  
26/2/21  
**REGISTRAR**



**UG IV SEMESTER R 19 NEW  
SKILL ENHANCEMENT COURSE 3**

**LEADERSHIP & MANAGEMENT SKILLS**

**ALL STREAMS  
(BA/BA(L)/B.COM/B.B.A/BSC)**

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## Course 3: Leadership and Management Skills

### Context with Justification :

Leaders are foundations of the society, who face and win against adversities and odds of life. Through their words and deeds, they show path to others and transform into inspirational role models, affecting social life vividly. In the current times of cut-throat competitions, disbelief in values, techno-centric complex lifestyles, there is a dire need to emphasise the 'human' agency in community living. This can be done by cultivating and nurturing the innate leadership skills of the youth so that they may transform these challenges into opportunities and become torch bearers of the future by developing creative solutions.

### Objectives :

The Module is designed to:

- Help students to develop essential skills to influence and motivate others
- Inculcate emotional and social intelligence and integrative thinking for effective leadership
- Create and maintain an effective and motivated team to work for the society
- Nurture a creative and entrepreneurial mindset
- Make students understand the personal values and apply ethical principles in professional and social contexts.

### Expected Outcomes :

Upon completion of the course students will be able to:

1. Examine various leadership models and understand/assess their skills, strengths and abilities that affect their own leadership style and can create their leadership vision
2. Learn and demonstrate a set of practical skills such as time management, self management, handling conflicts, team leadership, etc.
3. Understand the basics of entrepreneurship and develop business plans
4. Apply the design thinking approach for leadership
5. Appreciate the importance of ethics and moral values for making of a balanced personality.

**Credit: 02**

**Duration: 30 Hours**

**Number & Titles of Modules:**

<b>Module 1</b>	<b>Leadership Skills</b>	<b>6 Hours</b>
<b>Module 2</b>	<b>Managerial Skills</b>	<b>6 Hours</b>
<b>Module 3</b>	<b>Entrepreneurial Skills</b>	<b>6 Hours</b>
<b>Module 4</b>	<b>Innovative Leadership and Design Thinking</b>	<b>6 Hours</b>
<b>Module 5</b>	<b>Ethics and Integrity</b>	<b>6 Hours</b>



## Module Outline :

### Module 1- Leadership Skills

6 Hours

- a. **Understanding Leadership and its Importance**
  - What is leadership?
  - Why Leadership required?
  - Whom do you consider as an ideal leader?
- b. **Traits and Models of Leadership**
  - Are leaders born or made?
  - Key characteristics of an effective leader
  - Leadership styles
  - Perspectives of different leaders
- c. **Basic Leadership Skills**
  - Motivation
  - Team work
  - Negotiation
  - Networking

### Module 2 - Managerial Skills

6 Hours

- a. **Basic Managerial Skills**
  - Planning for effective management
  - How to organise teams?
  - Recruiting and retaining talent
  - Delegation of tasks
  - Learn to coordinate
  - Conflict management
- b. **Self Management Skills**
  - Understanding self concept
  - Developing self-awareness
  - Self-examination
  - Self-regulation

### Module 3 - Entrepreneurial Skills

6 Hours

- a. **Basics of Entrepreneurship**
  - Meaning of entrepreneurship
  - Classification and types of entrepreneurship
  - Traits and competencies of entrepreneur
- b. **Creating Business Plan**
  - Problem identification and idea generation
  - Idea validation
  - Pitch making

### Module 4 - Innovative Leadership and Design Thinking

6 Hours

- a. **Innovative Leadership**
  - Concept of emotional and social intelligence



- Synthesis of human and artificial intelligence
- Why does culture matter for today's global leaders

### **b. Design Thinking**

- What is design thinking?
- Key elements of design thinking:
  - Discovery
  - Interpretation
  - Ideation
  - Experimentation
  - Evolution.
- How to transform challenges into opportunities?
- How to develop human-centric solutions for creating social good?

## **Module 5- Ethics and Integrity**

**6 Hours**

### **a. Learning through Biographies**

- What makes an individual great?
- Understanding the persona of a leader for deriving holistic inspiration
- Drawing insights for leadership
- How leaders sail through difficult situations?

### **b. Ethics and Conduct**

- Importance of ethics
- Ethical decision making
- Personal and professional moral codes of conduct
- Creating a harmonious life

**Pedagogy :** Pedagogy for the modules is as follows:

1. Leadership Skills - Lectures (augmented with videos); role-plays for leadership models; team building games
2. Managerial Skills - Lectures (augmented with videos), case studies (AMUL, TESLA, Toyota, DMRC, Tata Group, Google, The Mumbai Dabbawala), SWOT analysis, Johari window
3. Entrepreneurial Skills - Lectures (augmented with videos), case studies and practicing business plans
4. Innovative Leadership and Design Thinking- Concept discussion through lecture and videos followed by role-plays and exercises for each set of intelligence, activities using 5 steps – discovery, interpretation, ideation, experimentation, and evolution (Ref.: Workbook of Design Thinking by IDEO)
5. Ethics and Integrity- Experiential learning through stories suggested list (Ahilya Bai, Holkar, Abdul Kalam, Raja Harishchandra, Mahatma Gandhi, Abraham Lincoln), audio visual augmented role plays and storytelling (leaders from varied fields like academics, corporate, social, sports, art, etc.)



**UG IV SEMESTER R 19 NEW  
SKILL ENHANCEMENT COURSE 4**

**B.Sc. (LIFE SCIENCE)**

- a) Vermiculture
- b) Greenhouse Technology
- c) Industrial Fermentations
- d) Mushroom Cultivation

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Instructions: 2hr per week  
No. of period: 30  
No. of credits: 2

BSC -LIFE SCIENCES  
SKILL ENHANCEMENT COURSE 4  
UG IV SEMESTER R 19NEW  
SEC4(A) VERMICULTURE

**UNIT-I:**

- (15 Periods)**
- 1.1 Scope of vermi technology- Vermiculture and vermi composting – difference between vermiculture and vermi composting –
  - 1.2 Earthworm diversity – Ecological groups of earthworms, biology of composting earthworms – *Eoisena foetida*, *Eudrilus lugeniae*.
  - 1.3 Soil – Physical, chemical and biological features
  - 1.4 Organic waste sources – problems in traditional composting, vermi composting
  - 1.5 Types small and large scale pit method, heap method.

**UNIT-II:**

- (15 Periods)**
- 2.1 Vermiculture techniques – vermi culture process – site selection - Selection and collection of species mono and poly culture
  - 2.2 Essential parameters for vermi culture – bedding. Methods of harvesting worms general manual methods, self harvesting method, mechanical method
  - 2.3 Nutritive value of vermi compost, storing and packing of compost
  - 2.4 Applications of vermi composting in agricultural and horticultural practices
  - 2.5 Economic of vermi culture, nationalized bank, NABARD support for vermi culture.

**References:**

1. Earthworm ecology by LEE
2. Biology of earthworm by Steven son
3. Vermicomposting tech – soil health to human health by Ranganathan L.S.



BSC -LIFE SCIENCES  
SKILL ENHANCEMENT COURSE 4  
UG IV SEMESTER R 19NEW

(30h)

## UNIT – I

## SEC4(B) GREENHOUSE TECHNOLOGY

(15h)

1. Introduction; scope – classification of greenhouses – construction of greenhouse- heating unit – cooling unit – environmental control (light and temperature).
2. Net- poly houses- low cost green houses. Root media for greenhouses
3. Fertilizers: Organic and inorganic, liquid fertilizers, application of fertilizers.
4. Water in the Greenhouses: Irrigation system in green houses – misting, Drip irrigation- micro irrigation, water quality, water sanitation.

## UNIT – II

(15h)

5. Plant Protection in Greenhouses: Diseases of greenhouse plants (bacterial, fungal, nematodes and viral diseases)
6. Management of pest and diseases – integrated pest management.
7. Applications of Greenhouse Technology: Importance of greenhouse technology. Micropropagation and greenhouse planting of tissue culture transplants
8. Advantages and disadvantages of greenhouse technology. Seed production, cut flower gardening.

**Suggested Readings**

1. Dubey R.C. 2006. A text book of Biotechnology. S.Chand and Company. New Delhi.
2. Sheela V.L. 2011. Horticulture. MJP Publishers. Chennai,
3. Prasad S., Kumar U. 2012. Green House Management for Horticultural Crops. Agrobios India.
4. Pant V. and Nelson. 1991. Green House Operation and Management. Bali Publication. New Delhi.
5. Introduction to soil science: <http://www.agrimoon.com/wpcontent/uploads/Introduction-to-soil-science.pdf>
6. Greenhouse applications: [http://www.lindegas.com/en/products\\_and\\_supply/fumigants/carbon\\_dioxide\\_in\\_agriculture/greenhouse\\_applications/index.html](http://www.lindegas.com/en/products_and_supply/fumigants/carbon_dioxide_in_agriculture/greenhouse_applications/index.html)
7. Role of greenhouse technology in agricultural engineering:



**1. Unit: Production of industrial chemicals, biochemicals, chemotherapeutic products and purification of proteins.**

- 1.1. Propionic acid, butyric acid, 2-3 butanediol, gluconic acid, itaconic acid
- 1.2. Biofuels: biogas, ethanol, butanol, hydrogen, biodiesel
- 1.3. Microbial insecticides; microbial flavours and fragrances, newer antibiotics
- 1.4. Anti cancer agents, amino acids
- 1.5. Upstream and downstream processing, solids and liquid handling
- 1.6. Centrifugation, filtration of fermentation broth and anaerobic fermentation

**2. Unit: Microbial products of pharmacological interest**

- 2.1. Steroid fermentations and transformations
- 2.2. Metabolic engineering of secondary metabolism for highest productivity
- 2.3. Enzyme and cell immobilization techniques in industrial processing
- 2.4. Rate equations for enzyme kinetics- Simple and complex reactions
- 2.5. Enzymes in organic synthesis, proteolytic enzymes, hydrolytic enzymes, glucose isomerise
- 2.6. Enzymes in food technology/organic synthesis

**REFERENCE BOOKS**

1. Patel, A.H. (1984). Industrial Microbiology, Mac Milan India Ltd., Hyderabad.
2. Cassida, L.E. (1968). Industrial Microbiology, Wiley Eastern Ltd. & New Age International Ltd., New Delhi.
3. Crueger, W. and Crueger, A. (2000). Biotechnology – A Text Book of Industrial Microbiology, Panima Publishing Corporation, New Delhi
4. Reedy, G. (Ed.) (1987). Prescott & Dunn's Industrial Microbiology, 4th Edition, CBS Publishers & Distributors, New Delhi.
5. Reddy, S.R. and Singara Charya, M.A. (2007). A Text Book of Microbiology - Applied Microbiology. Himalaya Publishing House, Mumbai.
6. Singh, R.P. (2007). Applied Microbiology. Kalyani Publishers, New Delhi.
7. Demain, A.L. and Davies, J.E. (1999). Manual of Industrial Microbiology and Biotechnology, ASM Press, Washington, D.C., USA.



Title: MUSHROOM CULTIVATION BSC -LIFE SCIENCES  
SKILL ENHANCEMENT COURSE 4  
UG IV SEMESTER R 19NEW  
SEC4(D) MUSHROOM CULTIVATION

2HPW-Credits-2

**UNIT-1**

- Introduction to mushroom cultivation
- Importance and history of mushroom cultivation in India
- Global status of mushroom production
- Edible mushrooms (white button oyster, Paddy straw).
- Nutritional value and health benefits of mushrooms

**UNIT-2**

- Steps in mushroom cultivation
  - a. Selection of site and types of mushroom
  - b. Mushroom farm structure, design layout
  - c. Principle and techniques of compost and composting
  - d. Principle of spawn production
  - e. Casing and crop production
  - f. Harvesting and marketing
  - g. Entrepreneurship development in Mushroom cultivation
- Pest and pathogens of mushrooms
- Post harvest handling and preservation of mushrooms

Reference:

1. Mushroom cultivation in india by B.C.Suman and V.P. Sharma Published by Daya publishing house New Delhi.
2. Mushrooms Cultivation, Marketing and Consumption Manjit Singh Bhuvnesh Vijay Shwet Kamal G.C. Wakchaure Directorate of Mushroom Research (Indian Council of Agricultural Research) Chambaghat, Solan –173213 (HP)



**UG IV SEMESTER R 19 NEW  
SKILL ENHANCEMENT COURSE 4**

**B.COM., ALL STREAMS**

- a) Social Media Marketing
- b) Practice of Life and General Insurance

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**SATAVAHANA UNIVERSITY, KARIMNAGAR,  
TELANGANA STATE**

**Skill Enhancement Course (SEC): Communicative Skills in English**

C.B.C.S. – U.G. Common Core

2 Credits (2 hours per week)

Common paper for all UG III-Semester Courses

**Objectives of the course:**

The course has been designed for UG students to be able to create an awareness about the four fold language skills and it also motivates the students to use different language skills and their sub skills in their day to day life. They further train the students to have adequate knowledge and exposure to different genres of language in English.

**The Syllabus:**

**Unit – I: Oral Skills**

- Sub-skills of Listening
- Understanding the Real Purpose of Listening
- Factors affecting Listening Comprehension
- How to Develop Listening Comprehension
- Essential Elements for Speaking
- Sub-skills of Speaking
- How to Develop Speaking Skills

(The following areas to be covered: Speech Sounds in English, Stress, Intonation, Rhythm, and Voice Quality, Characteristics of a Speech, Group Discussion, Mock Interview, JAMs and Strategies for Spoken English)

**Unit – II: Written Skills**

- Sub-skills of Reading
- How to read, reflect and interpret the text
- Factors affecting Reading comprehension
- How to develop Reading Skills
- Essential Elements for Writing
- Sub-skills of Writing
- Factors affecting Writing skills
- How to get mastery in Writing

(The following areas to be covered: Narrative passages, Reading and understanding advertisements, matrimonial, classifieds and resumes, brochures, tabular forms; Review of articles, news items and books, Paragraph Writing, Letter Writing, Notice, Invitation, Resume and qualities of good handwriting.)



### **Suggested Reading:**

1. Byrne, Donn. *Listening Comprehension. Teaching Oral English.* New York: Longman, 1976.
2. Ur, Penny. *Teaching Listening Comprehension.* Cambridge, C.U.P., 1984.
3. .Balasubramanian, T. *A Textbook of English Phonetics for Indian Students.* Madras: Macmillan India Press, 1981.
4. Bansal, R.K. and J. B. Harrison. *Spoken English for India.* London: Orient Longman, 1972.
5. Doff, Adrian. *Teach English: A Training Course for Teachers.* Cambridge: C.U.P. ,1988.
6. Jones, Danial. *Everyman's English Pronouncing Dictionary.* London: ELBS, 1974.
7. Munby, John. *Read and Think: Training in Intensive Reading Skills.* England: Longman Group Ltd., 1978.
8. Nuttall, Christine. *Teaching Reading Skills in a Foreign Language.* London: Heienemann, 1982.
9. Freeman, Sarah. *Written Communication in English.* Hyderabad: Orient Longman, 1996.
10. Hedge, Tricia. *Writing.* Oxford: O.U.P.1991.