Sarvajanik University

Faculty of Science

B.Sc. (Hons)

Faculty: Science	Department: All
Program: B.Sc. (Hons)	Type: Minor
Subject: Foundation Minors in Applied Sciences-1	Credits: 4
Semester: 1	
Course description: The objectives of this course are to provide students with fundamental scientific knowledge of basics of Agriculture & Forestry, Analytical chemistry & Instrumentation, Forensic science, Industrial Fermentation, Medical Lab Technology & Occupational Health concepts. It will help students in creating a strong foundation necessary for science based careers.	
Student Learning Outcome: ● Obtained ideas on various branches Agriculture & Forestry, Analytical chemistry & Instrumentation, Forensic science, Industrial Fermentation, Medical Lab Technology & Occupational Health concepts. ● Students will be acquainted with the historical account and development. ● Able to learn scientific principles and scope of Agriculture & Forestry, Analytical chemistry & Instrumentation, Forensic science, Industrial Fermentation, Medical Lab Technology & Occupational Health. ● Will be aware of general characteristics and able to gather knowledge about Agriculture & Forestry, Analytical chemistry & Instrumentation, Forensic science, Industrial Fermentation, Medical Lab Technology & Occupational Health.	

Unit-1: Introduction forestry: **(10 hrs)**

1.1 Concept of forest ecosystem and dynamics of forest succession
1.2 Classification of world's forest vegetation
1.3 Productivity and vegetation forms of India and forest composition and classification
1.4 Natural regeneration of species and types of uneven-aged silviculture
1.5 Principles of silviculture and physical-ecological factors affecting it.

Unit-2: Scope and importance of analytical chemistry **(10 hrs)**

2.1 Introduction and role of analytical chemistry in sciences
2.2 Quantitative analysis; major, minor and trace constituents
2.3 SI Units: Basic units, Derived units, Conversion between units
2.4 Concept of concentration: Mole, Molar mass, Solutions and their concentrations

Unit-3 Forensic science and Forensic laboratories **(10 hrs)**

3.1 Introduction, definition and principles
3.2 Laws of forensic science

3.3 Historical aspects of forensic science in India
3.4 Need of forensic science in present scenario
3.5 Types and divisions
3.6 Forensic examination
3.7 Organizational set up of forensic science laboratories at central and state level.
3.8 Introduction of BPR& D, NICFS,CDFD,CCMB, IITR, CDTS, NCRB

Unit-4 History and Basic of Industrial Fermentation Processes (10 hrs)

4.1 Historical development of industrial processes
4.2 The range of fermentation processes
4.3 The component parts of fermentation process
4.4 Stages of fermentation process
4.5 Types of fermentation Process – Batch, Continuous & Fed batch

Unit-5 Organization of the Clinical laboratory and Laboratory Safety (10 hrs)

5.1 Clinical pathology laboratory definition & Laboratory Premises
5.2 Functional components of clinical laboratories
5.3 Various types of laboratories
5.4 Responsibilities of the laboratory worker
5.5 Precautions for prevention of transmission of pathogens
5.6 Precautions regarding fire and explosions
5.7 Important instructions to reduce infections in laboratory workers

Unit-6 Introduction of Occupational Health (10 hrs)

6.1 Basic concepts of Occupational Health and Safety (OHS).
6.2 Hazard identification and prevention techniques at the workplace.
6.3 Occupational Health and Safety Standards.
6.4 Workplace environment monitoring and measurements.
6.5 Occupational health hazards and preventive measures.

Practicals:

1. Study of Raunkiaer;s normal frequency distribution of vegetation.
2. Study of anatomical adaptations of hyrophytes (Roots and petiole), Xerophytes (Stem and Root), Mesophytes (monocot and dicot leaf, stem and root).
3. Use and calibration of volumetric equipment (volumetric flasks, pipette's and burette's)
4. Preparation of standard solutions of acids and bases
5. Preparation of standard solution of EDTA and estimation of magnesium using EDTA
6. Determination of specific gravity of petroleum products
7. To compare physical evidence (Cloth, Thread)
8. Introduction to laboratory batch fermenter.
9. Study of safety symbols and waste disposal in clinical laboratories.
10. Measurement of Illumination by Lux meter.

References and Textbooks: (With Author, Edition, Publishers, ISBN)

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Agriculture & Forestry:

- Dwivedi AP. 1992. *Agroforestry: Principles and Practices*. Oxford and IBH.
- Dwivedi AP. 1993. *A Text Book of Silviculture*. International Book Distributors, Dehradun.
- Khanna LS. 1996. *Principle and Practice of Silviculture*. International Book Distributors.
- Smith DM, Larson BC, Ketty MJ & Ashton PMS. 1997. The Practices of Silviculture-Applied Forest Ecology. John Wiley & Sons.

Analytical Chemistry:

- Douglas A. Skoog and Donald M..West: Fundamentals of Analytical Chemistry.
- Adion A. Gordus: Schaum's Outline of Analytical Chemistry, Tata McGraw-Hill.
- Gary D. Christian : Analytical Chemistry .
- Freifelder and Kealy: Analytical Chemistry

Forensic Science:

- Henry Lee's Crime Scene Handbook:Henry C Lee
- Forensic Biology:Shrikant H. Lade
- Crime Scene Processing and Laboratory Work Book : Patric Jones
- Forensic Science: An Introduction to Scientific and Investigative Techniques 3rd ed. : Stuart H. James

Industrial Fermentation Technology:

- Patel, A. H. (2016). Industrial Microbiology, 2nd Ed., Trinity press; An imprint of Laxmi publications PVT. Ltd.
- Stanbury, P., Whitaker, A. and Hall, S. J. (2016). Principles of fermentation technology, 3rd Ed., Butterworth-Heinemann.

Medical Laboratory Technology:

- P.B. Godkar, (2014), Textbook of Medical Laboratory Technology, Vol I, 3rd ed.,← Bhalani Publishing House, Mumbai, India. (ISBN: 9789381496190)
- Mukharjee K.L. (1999), Medical Laboratory Technology, Vol I, 2nd ed., Tata MacGraw Hill. (ISBN: 9789352606818)

Occupational Health:

- Mistry K.U (2012): Fundamentals of Industrial Safety & Health-I, Siddharth Prakashan, Ahmedabad.
- Mistry K.U (2012): Fundamentals of Industrial Safety & Health-II, Siddharth Prakashan, Ahmedabad.
- Benjamin O. Alli (2008): Fundamental principles of occupational health and safety, International Labour Office; 2nd edition, 978-9221204541.