



# **C. U. SHAH UNIVERSITY**

FACULTY OF SCIENCES

BACHELOR OF SCIENCE (BIOTECHNOLOGY)

DEPARTMENT OF ARTS & HUMANITIES

SEMESTER: VI

CODE: 4SC06PET1

NAME: Professional Etiquettes-II

**Course outline:**

<b>Sr. No.</b>	<b>Course Content (Title of the Unit)</b>	<b>Minimum Number of Hours</b>
1	Interview-2	6
2	Group Discussion	6
3	Debate	4
4	Public Speaking	4
5	Technical Presentation/Talk	6
6	Resume Building	4
7	Official (Job) Letters	7
8	Circular, Memorandum	4
9	Technical Research Paper and Thesis/Dissertation	5
10	Competitive Exam Guidance	4
11	<b>Wings of Fire by Abdul Kalam-Propitiation &amp; Contemplation Chapters</b>	<b>10</b>
	<b>Total</b>	<b>60</b>

**Detail Course Content:**

<b>Unit No.</b>	<b>Detailed Contents</b>
	<b>Section-A</b>
<b>1</b>	Interview <ul style="list-style-type: none"><li>• Introduction</li></ul> Importance Procedure Types Qualities observed by the employer Frequently asked questions Failure factors <ul style="list-style-type: none"><li>• Practice of interview and revision of important aspects of interview</li></ul>
<b>2</b>	<b>Group Discussion</b> <ul style="list-style-type: none"><li>• Introduction</li><li>• Importance</li><li>• Characteristics of successful group discussion</li><li>• Types</li></ul> <b>Debate</b> <ul style="list-style-type: none"><li>• Introduction</li></ul>



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	<ul style="list-style-type: none"> <li>• Difference between group discussion and debate</li> <li>• Importance</li> <li>• Assessment criterions</li> </ul>
<b>3</b>	<b>Public Speaking</b> <ul style="list-style-type: none"> <li>• Introduction</li> <li>• Difference between presentation and public speaking</li> <li>• Qualities of good speaker</li> <li>• Non verbal communication</li> </ul> <b>Technical Presentation/Talk</b> <ul style="list-style-type: none"> <li>• Introduction</li> <li>• Preparing technical presentation</li> <li>• Language of the presentation</li> <li>• Using technological aids for presentation</li> </ul>
<b>4</b>	<b>Resume Building</b> <ul style="list-style-type: none"> <li>• Introduction</li> <li>• Difference between curriculum vitae and resume</li> <li>• Types</li> <li>• Formats</li> <li>• Sample of resumes</li> </ul>
<b>5</b>	<b>Official (Job) Letters</b> <ul style="list-style-type: none"> <li>• Cover letter/job application: solicited &amp; unsolicited</li> <li>• Follow-up application</li> <li>• Job acceptance letter</li> <li>• Job refusal letter</li> <li>• Resignation letter</li> <li>• Termination letter</li> <li>• Relieving letter</li> </ul>
<b>6</b>	<b>Circular, Memorandum</b> <ul style="list-style-type: none"> <li>• Objectives of circular and memorandum</li> <li>• Drafting circular and memorandum</li> </ul>
<b>7</b>	<b>Technical Research Paper and Thesis/Dissertation</b> <ul style="list-style-type: none"> <li>• Introduction to research paper, thesis and dissertation</li> <li>• Types of research paper</li> <li>• Difference between research paper and article</li> <li>• Elements in research paper</li> <li>• Writing components: language, vocabulary, punctuation, cohesion, clarity etc.</li> </ul>
<b>8</b>	<b>Competitive Exam Guidance</b> <ul style="list-style-type: none"> <li>• Introduction to various competitive exams conducted by government</li> <li>• How to crack the competitive examination-tips</li> <li>• Major areas for preparation</li> <li>• Helping tools: websites, magazines, newspapers, employment news papers</li> </ul>
	<b>Section-B: Literature</b>
<b>9</b>	<b>Wings of Fire by Abdul Kalam-Propitiation &amp; Contemplation Chapters</b>

## **References:**

<b>Sr</b>	<b>Title</b>	<b>Author</b>	<b>Publisher</b>
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No.			
1	Effective Personal Communication Skills for Public Relations	Green Andy John M. Penrose Jr., Robert W. Rasberry, Robert J. Myers	Kogan age Limited
2	Advanced Buisness Communication		Thomason/South- Western
3	Technical Communication	D.K.Chakradev	Tech-max Publication
4	Basic Buisness Communication	Flatly and Lesikar William J. Kelly and Deborah L. Lawton	
5	From Sentence to Paragraph	Meenaxi Raman & Sangeeta Sharma	Longman Oxford
6	Technical Communication: Principles and Practice	Rhoda Doctor	University Presss
7	Principles and Practice of Business Communication		Sheath publishers Tata Mc Graw hill
8	Effective Technical Communication	M Ashraf Rizvi	
9	Personality Development and Soft Skills	Mitra Barun	OUP Tata Mc Graw hill
10	Resumes and Interviews	M Ashraf Rizvi	Prentice-Hall of India Ltd
11	Business Communication	Asha Kaul Lesikar Raymond V & Pettit John D	AIIBS Publishers & Distributers Jaico Publishing House
12	Business Communication		Himalaya
13	Hand Book of Practical Communication Skills	Chrissie Wrought	Publishing House
14	Communication Today – Understanding Creative Skills	Ray Reuben	Tata Mc Graw hill
15	Managing Soft Skills for Personality Development	B.N. Ghosh	
16	Wings of Fire	Abdul Kalam	University Press



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FACULTY OF SCIENCES  
BACHELOR OF SCIENCE (BIOTECHNOLOGY)  
DEPARTMENT OF BIOTECHNOLOGY

SEMESTER: VI

CODE: 4SC06EEB1

NAME: ECOLOGY & EVOLUTIONARY BIOLOGY

## **Course content:**

<b>Sr. No.</b>	<b>Course contents</b>	<b>Teaching Hours</b>
1	<b>Introduction to Ecology</b> History of ecology; Definition, scope and importance <b>Environmental Factors</b> Climatic; Topographic; Biotic (species interactions); and Edaphic (soil profile, physicochemical properties); Soil erosion and conservation.	05
2	<b>Population Ecology</b> Introduction; Population characteristics, Genecology (Ecads, ecotypes and ecospecies). <b>Community Ecology</b> Introduction; Qualitative, Quantitative and Synthetic characteristics; Methods of analysis. <b>Ecosystem Ecology</b> Structure (components) and functions (trophic levels, food chains, food webs, ecological pyramids and energy flow.	10
3	Primitive earth; Major events in the history of life; Modern (Chemosynthetic) theory of life origin; Miller's experiment; <b>Organic Evolution</b> Meaning and evidences (Anatomical, Embryological, Physiological and Paleontological	05
4	<b>Lamarck's theory of inheritance of acquired characters</b> ; Darwin's theory of natural selection; Hardy-Weinberg principle and its applications; Macro, Micro and Molecular evolution; Molecular clocks; Agents of evolutionary change (Mutation, Gene flow, Non-random mating, Genetic drift and Selection); Coevolution; Cataclysmic evolution; Enzyme polymorphism; Species concept (Biological, Evolutionary and Ecological); Isolating mechanisms and type of speciation; Modern interpretation of Darwinism.	10
<b>Total Hours</b>		<b>30</b>

## **Learning Outcomes:-**

At the end of the course the student would have gained requisite knowledge about the evolutionary processes and their relationship with biology of the organism.

## **Teaching & Learning Methodology:-**

- Use of audiovisual aids.
- Use of charts.
- Student interaction, group discussion, seminar, quizzes, assignment, brain storming session.



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### **Books Recommended:**

- Bhatia, A.L. 2010. Text Book of Environmental Biology. I.K. International Publishing House Pvt. Ltd.
- Bhatia, K.N. 2002. A Treatise on Plant Ecology. Pradeep Publications.
- Dash, M.C. 2001. Fundamentals of Ecology. Tata McGraw-Hill Education.
- Jr. Miller, G.T. and Spoolman, S.E. 2011. Essentials of Ecology. Brooks / Cole. CENGAGE Learning.
- Jr. Molles, M.C. Ecology; Concepts and Applications. 2008. McGraw-Hill.
- Kormondy, E.J. 1996. Concepts of Ecology. Prentice Hall of India Pvt. Ltd. New Delhi.
- Odum, E.P. 1971. Fundamentals of Ecology. Saunders, Philadelphia.
- Odum, E.P. and Barrett, G.W. 2005. Fundamentals of Ecology. Thomson Brooks / Cole.
- Sharma, P.D. 2012. Ecology and Environment. Rastogi Publications.
- Brooker, R.J. 2012. Concepts of Genetics; **(Chapter-27: Evolutionary Genetics)**. McGraw-Hill.
- Gardner, E.J., Simmons, M.J. and Snustad, D.P. 1991. Principles of Genetics; **(Chapter-22: Evolutionary Genetics)**. John Wiley & Sons, Inc.
- Kay, L.E. 1993. The Molecular Vision of Life. 1993. Oxford University Press.
- Klug, W.S., Cummings, M.R., Spencer, C.A. and Palladino, M.A. 2012. Concepts of Genetics; **(Chapter-25: Population and Evolutionary Genetics)**. Pearson Benjamin Cummings.
- Raven, P.H., Johnson, G.B., Mason, K.A., Losos, J.B. and Singer, S.R. 2014. Biology; **(Part-IV: Evolution)**. McGraw-Hill.



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DEPARTMENT OF BIOTECHNOLOGY

SEMESTER: VI

CODE: 4SC06PIP1

NAME: Patents & IPR

**Course outline:**

Sr. No.	Course contents	Teaching Hours
1	<b>Introduction to Intellectual Property Law</b> The Evolutionary Past The IPR Tool Kit Para -Legal Tasks in Intellectual Property Law Ethical obligations in Para Legal Tasks in Intellectual Property Law Introduction to Cyber Law Innovations and Inventions Trade related Intellectual Property Right TRIP- GATT and PBR, WTO	10
2	<b>Introduction to Trademark</b> Trademark Registration Process Post registration Procedures Trademark maintenance Transfer of Rights Inter parties Proceeding Infringement Dilution Ownership of Trademark Likelihood of confusion Trademarks claims Trademarks Litigations International Trade mark Law	10
3	<b>Introduction to Copyrights</b> Principles of Copyright The subjects Matter of Copy right The Rights Afforded by Copyright Law Copy right Ownership, Transfer and duration Right to prepare Derivative works Rights of Distribution Rights of Performing the work Publicity Copyright Formalities and Registrations - Limitations Copyright disputes and International Copyright Law	10
<b>Total Hours</b>		<b>30</b>

**Learning Outcomes:-**

This course introduces students to Intellectual Property (IP) Law in general and its three common categories: Industrial Property (mostly patents), Trademarks and Copyright. The



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course provides an overview of the main principles and legal rules of IP Law, focusing specifically on the theoretical and practical connections between IP and academic/scientific works/studies and on the IP issues with which the students are likely to come into contact in their different areas of knowledge.

### **Teaching & Learning Methodology:-**

Theory Lectures as recommended in the teaching scheme.

### **Books Recommended:**

1. Debirag E.Bouchoux: “Intellectual Property”. Cengage learning , New Delhi
2. M.Ashok Kumar and Mohd.Iqbal Ali: “Intellectual Property Right” Serials Pub.
3. Cyber Law. Texts & Cases, South-Western’s Special Topics Collections
4. Prabhuddha Ganguli: ‘ Intellectual Property Rights” Tata Mc-Graw –Hill, New Delhi
5. Singh K, Intellectual Property rights on Biotechnology, BCIL, New Delhi, 2010
6. Beier, F.K., Crespi, R.S. and Straus, T. Biotechnology and Patent protection-Oxford and IBH Publishing Co. New Delhi, 1985



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DEPARTMENT OF BIOTECHNOLOGY

SEMESTER: VI

CODE: 4SC06FDM1

NAME: Food & Dairy Microbiology

**Course outline:**

Sr. No.	Course contents	Teaching Hours
1	<b>Introduction to food microbiology :</b> Food as substrate ( $H^+$ ion concentration, water activity, OR potential, nutrient content, Inhibitory substances) Important microorganism in food microbiology (Molds, yeasts and bacteria),	15
2	<b>Food preservation :</b> General principles of food preparation (asepsis, anaerobic condition, removal of microorganism and maintenance), Preservation by high temperature, preservation by low temperature, drying, food additives, radiation method	15
3	<b>Spoilage of food :</b> Sugar and sugar product, meat and meat product, vegetables and fruit, Milk and milk product	15
4	<b>Microbiology of fermented food:</b> Culture preparation for food fermentation, Microbiology of cheese production, microbiology of Bread production, Malt beverages and wine	15
5	<b>Food borne disease:</b> Bacterial ( <i>Clostridium perfringens</i> , <i>Escherichia coli</i> , <i>Bacillus cereus</i> , <i>Plesiomonas shiegelloides</i> ), mycotoxin, virus and fungus	15
6	<b>Food sanitation and control :</b> Microbiology of water, Microbiology of sewage and waste water disposal, Sanitation and hazard control, microbiological criteria of foods	15
<b>Total Hours</b>		<b>90</b>

**Books Recommended:**

1. William c. Frazier (2002) Food microbiology 4<sup>th</sup> edition
2. Lansing /M. Prescott (2002) Microbiology 5<sup>th</sup> edition
3. James M. Jay (2000) Modern food microbiology 6<sup>th</sup> edition
4. Charles W. Bamforth (2005) Food, fermentation and microorganism
5. Bibek Ray (2005) Fundamentals of food microbiology





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## **INDUSTRIAL BIOTECHNOLOGY**

Course Code: 4SC06IBT1

Credit: 04

### **Course outline:**

<b>Sr. No.</b>	<b>Course contents</b>	<b>Teaching Hours</b>
1	Introduction to fermentation and types of fermentor, Production process batch and Continuous system of cultivation, Solid-state fermentation.	10
2	Industrial microorganism's selection, fermentation media, aeration, pH, temperature and other requirements during fermentation, downstream processing and product recovery, food industry waste as fermentation substrate.	10
3	Production of commercial products viz. antibiotics, enzymes, organic acids, solvents, SCP.	10
4	Production of fermented dairy products, Enzyme Immobilization and their industrial applications.	10
<b>Total Hours</b>		<b>40</b>

### **Text & References:**

#### *Text:*

Industrial Microbiology – Cassida

#### *References:*

Principles of fermentation Technology, Salisbury, Whitaker and Hall  
Industrial microbiology – Prescott & Duhn.