



SYLLABUS

Course Title	MICROBIOLOGY VIII	
Course Code	BSM 601	
Course Credit	Lecture	: 04
	Tutorial	: 00
	Practical	: 02
	Total	: 06
Detailed Syllabus:		
Sr. No	Name of chapter & Details	Session Allotted
SECTION-I		
1	Chapter name : Immunity and Immunogen Types of immunity : Natural, Acquired, herd, Innate, specific; Cells and organs of immune system : An overview, Primary response and generation of memory, Antigen (Immunogenicity versus antigenicity, Factors influencing Immunogenicity, Adjuvant, Epitopes and Haptens, Antigen processing and presentation)	10
2	Chapter name : Antigen and Antibody Antibody: Basic structure of Antibody, Immunoglobulin classes and their Biological activities, Epitopes and Receptors on immunoglobulin molecule, Antibody Diversity and Clonal Selection Theory, Overview of Monoclonal Antibody, Strength of antigen – antibody reaction: Antibody affinity and avidity	10
3	Chapter name : Dysfunctional Immunity Immunodeficiency Diseases, Hypersensitivity, Autoimmune diseases, Overview of Tumor immunity, Overview of Transplantation immunity	8
SECTION-II		
4	Chapter name : Infection and Prophylaxis Introduction to the normal flora of healthy human host, Host –microbe interactions (Process of Infection, Pathogenicity, Virulence and infection, Microbial adherence, Penetration of epithelial cell layers, Events in infection following penetration, Microbial virulence factors), Epidemiology of infectious disease : Markers, concepts and tools; Vaccines : Conventional and Modern, Microbial agent of Disease (Gram negative Bacteria – <i>Treponema</i> , <i>Salmonella</i> , <i>Shigella</i> , <i>E.coli</i> , <i>Neisseria</i> ; Gram positive Bacteria – <i>Clostridium</i> , <i>Mycobacterium</i> , <i>Streptococci</i> ; Protozoa – Amoebiasis, Malaria)	13

5	<p>Chapter name : Hematology and Serology</p> <p>Hematology (Discovery of human blood group system, Blood coagulation; Principle, significance and procedure of blood transfusion), Serology: A. In vitro antigen: antibody reaction: Precipitation (in fluid and gel, immune-electrophoresis), Agglutination (Haemagglutination, Bacterial Agglutination, Passive Agglutination and agglutination inhibition), Radioimmunoassay, ELISA, Western Blot, Immunofluorescence, Methods of specimen collection, Identification of microbes from specimen (Microscopy, Rapid methods of identification, Molecular methods).</p>	15
List of Practical (6 Hours per week)		
<ol style="list-style-type: none"> 1. To analyze medical problem: Understanding of the problem and isolation & identification of microbes from clinical specimen (blood, urine, sputum, skin scraping, swabs, stool samples) 2. To study the antibiotic susceptibility of the pathogens isolated from the clinical specimen 3. To study of serological and hematological reactions <ol style="list-style-type: none"> a. Agglutination (blood grouping, serodiagnosis of enteric fever by Widal test) b. Serodiagnosis of syphilis by RPR Test c. Total count of RBC and WBC d. Differential count of WBC e. Haemoglobin estimation by Sahli's method f. Bleeding time by filter paper technique and clotting time by capillary method g. Erythrocyte Sedimentation Rate (ESR--demonstration) 4. To perform Blood Chemistry <ol style="list-style-type: none"> a. Blood sugar estimation by GOD / POD method b. Blood urea by DAM method c. Serum bilirubin (demonstration) d. Cholesterol (demonstration) 5. To analyze physical, chemical and microscopic analysis of urine. 6. To study the microscopic study of pathogens (permanent slides); Acid Fast Bacilli, Treponema, Malarial Parasite, Entamoeba histolytic, Clostridium tetanii, Neisseria species 		
Instructional Method and Pedagogy:		
<ol style="list-style-type: none"> 1. Lectures will be conducted with the aid of multi-media projector, black board, OHP etc. 2. Assignments based on course content will be given to the students at the end of each unit/topic and will be evaluated at regular interval. 3. Surprise tests/Quizzes/Tutorials will be conducted. 4. The course includes a laboratory, where students have an opportunity to build an appreciation for the concepts being taught in lectures. 5. Minimum ten experiments shall be there in the laboratory related to course contents. 		
Students Learning Outcomes:		
<p>After Successful completion of the above course, students will be able to:</p> <ul style="list-style-type: none"> ▪ Recall the basic concepts of Immunology and serology 		

- Identify various serological test use for diagnosis of diseases
- Solve how immunity helps to fight against diseases
- Identify the medical problems by identifying microbes from clinical specimens

Text book:

1. Abul K. Abbas and Andrew H. Lichtman, Cellular and molecular Immunology, First south Asia edition, Elsevier, E-book.

Reference Books:

1. Barbara A. Osborne and Janis Kuby, Immunology, Fifth edition, Freeman, New York.



SYLLABUS

Course Title	MICROBIOLOGY IX
Course Code	BSM 602
Course Credit	Lecture : 04
	Tutorial : 00
	Practical : 02
	Total : 06

Detailed Syllabus:

Sr. No	Name of chapter & Details	Session Allotted
SECTION-I		
1	<p>Chapter name : The history and concept of genetics History of genetics and molecular biology, Mendelian Laws of inheritance. The gene concept: Units of genetic structure and genetic function, Gene Cistron relationship in Prokaryotes and Eukaryotes, Gene structure and architecture, DNA is the universal genetic material, DNA Replication – Mechanism and models.</p>	10
2	<p>Chapter name : Gene Expression and Regulation Transcription and post transcriptional modifications, Genetic code and Ribosome, Translation and post translational modifications, Levels of gene expression and regulation, Types and principles of gene regulation, Transcriptional regulation, The Operon Model :Regulation of lactose utilization – The lac operon, The Operon Model :Regulation of arabinose utilization – The ara operon, The Operon Model :Regulation of tryptophan biosynthesis – The trp operon, Post transcription control</p>	10
3	<p>Chapter name : Gene Transfer and Recombination Types of Recombination : Homologous recombination, Site specific recombination, Illegitimate recombination, Transformation: Natural transformation, competence, DNA uptake, role of natural transformation, Artificial induced competence, electroporation; Transduction: Generalized transduction, specialized transduction and abortive transduction; Conjugation: Mechanism of DNA transfer in Gram positive and Gram negative bacteria, Transposable genetic elements</p>	8

SECTION-II

4	<p>Chapter name : Mutation and DNA Repair Fluctuation analysis, Mutation and Mutation rate, Phenotypic effects of mutation, Phenotypic and Phenomic lag, Types of mutation :Spontaneous mutations and Induced mutations, Biochemical basis of mutation, Mutagenesis, Reversion and Ames test, DNA repair mechanisms - Mismatch repair, excision repair, photo reactivation, Recombinational repair and SOS repair</p>	13
5	<p>Chapter name : Genetic Engineering and Protein Engineering Genetic engineering: aims and applications, Genetic manipulations of prokaryotes (Isolation of DNA, Vectors of Recombinant-DNA Technology – pBR 322, pUC, Bacteriophages, Cosmid, Phagmid, BACs, YACs; Insertion of DNA molecules into a vector, Transformation and Growth, Detection of Recombinant molecules – Colony Hybridization, Expression of foreign DNA), Genetic manipulations of eukaryotes: Genetic manipulation of plant cells, animal cells and yeasts, Site directed mutagenesis, Molecular Chaperons, Directed Evolution.</p>	15

List of Practical (6 Hour per Week)

1. To isolation of DNA (only demonstration experiment).
2. To study estimation of DNA.
3. To perform conjugation in E. coli by plate method.
4. To isolation of plasmid (Only demonstration experiment)
5. To study the transformation of plasmid.
6. To isolation of RNA (only demonstration experiment).
7. To study estimation of RNA.
8. To study the isolation of Lactose non fermenter mutant of E. coli by physical mutagenesis.
9. To perform isolation of auxotrophic mutants by chemical mutagenesis (only demonstration experiment)
10. Isolation of antibiotic resistant bacterial population by gradient-plate method.

Instructional Method and Pedagogy:

1. Lectures will be conducted with the aid of multi-media projector, black board, OHP etc.
2. Assignments based on course content will be given to the students at the end of each unit/topic and will be evaluated at regular interval.
3. Surprise tests/Quizzes/Tutorials will be conducted.
4. The course includes a laboratory, where students have an opportunity to build an appreciation for the concepts being taught in lectures.
5. Minimum ten experiments shall be there in the laboratory related to course contents.

Students Learning Outcomes:

After Successful completion of the above course, students will be able to:

On the completion of the course, students will be able to:

- Recall the basic concepts of genetics
- Identify various levels of gene expression and their regulation

- Solve various types and mechanism for gene transfer and recombination
 - Identify mutation, types of mutation, mutagens and DNA repair mechanisms
- Discuss about genetic engineering and protein engineering

Text book:

1. Purohit, S.S., Microbiology-Fundamentals and Applications, 6th Edition, Agrobios Publications, Delhi.

Reference Books:

1. Shrivastava, Bioanalytical Techniques, International edition, PHI Learning Pvt. Ltd, New Delhi.



SYLLABUS

Course Title	MICROBIOLOGY X	
Course Code	BSM 603	
Course Credit	Lecture	: 04
	Tutorial	: 00
	Practical	: 02
	Total	: 06
Detailed Syllabus:		
Sr. No	Name of chapter & Details	Session Allotted
SECTION-I		
1	Chapter name : Natural Resources Introductions: Definition, Scope. Importance, Renewable and non-renewable resources: Natural resources and associated problems, Non-renewable resources, Renewable resources (Forest Resources, Water Resources, Mineral Resources, Food Resources, Energy Resources, Land resources)	10
2	Chapter name : Ecosystems Concept of an ecosystem(Understanding ecosystems, Ecosystem degradation, Resource utilization), Structure and functions of an ecosystem, Producers, consumers and decomposers, Energy flow in the ecosystem, Ecological succession, Food chains, Food webs and Ecological pyramids	10
3	Chapter name : Biodiversity and its conservation Introduction –Definition: genetic, species, ecosystem diversity (Genetic diversity, Species diversity, Ecosystem diversity), Threats to biodiversity, Conservation of biodiversity: in-situ and ex-situ, Biodiversity at global, national and local levels, India as a mega diversity nation	8
SECTION-II		
4	Chapter name : Environmental Pollution Definitions; Causes, effects and control measures of: Air Pollution, Water Pollution, Soil Pollution, Marine Pollution, Noise Pollution, Thermal Pollution, Nuclear hazards, Solid waste management: causes, effects and control measures of urban and Industrial waste, Roles of individuals in pollution prevention	13
5	Chapter name : Social Issues And the Environments Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and nuclear holocaust, Environment protection act, Wildlife protection act, Forest conservation act, Issues involved in enforcement of environmental	15

	legislation and public awareness, Environment Impact Assessment (EIA).	
List of Practical (6 Hours per Week)		
<ol style="list-style-type: none"> 1. To perform chemical analysis of water: Chloride, Hardness, Nitrite Nitrogen, Alkalinity, Acidity, TDS, TSS, TS. 2. To perform determination of air flora and air density from indoor & outdoor sources. 3. To study sewage treatment visit plant / Forest / Sanctuary / Soil Research Laboratory / GPCB Station and preparation of report. 4. To study model preparation as guided by faculty. 		
Instructional Method and Pedagogy:		
<ol style="list-style-type: none"> 1. Lectures will be conducted with the aid of multi-media projector, black board, OHP etc. 2. Assignments based on course content will be given to the students at the end of each unit/topic and will be evaluated at regular interval. 3. Surprise tests/Quizzes/Tutorials will be conducted. 4. The course includes a laboratory, where students have an opportunity to build an appreciation for the concepts being taught in lectures. 5. Minimum ten experiments shall be there in the laboratory related to course contents. <p>Numbering error</p>		
Students Learning Outcomes:		
<p>After Successful completion of the above course, students will be able to:</p> <ul style="list-style-type: none"> ▪ Recall various types of natural resources ▪ Solve what is biodiversity, its importance, types and conservation ▪ Identify types of pollution and its prevention ▪ To study social issues related to environment and Environment Impact Assessment (EIA) 		
Text book:		
<ol style="list-style-type: none"> 1. Dr. Y.K Singh, Environmental science, New age international publisher, New delhi. 		
Reference Books:		
<ol style="list-style-type: none"> 1.Odum EP, 1971. Fundamentals of Ecology. WB Saunders Co. USA. 		



SYLLABUS

Course Title		CREATING AND MANAGING NEW VENTURES	
Course Code		BBC308	
Course Credit	Lecture	: 03	
	Tutorial	: 00	
	Practical	: 00	
	Total	: 03	
Detailed Syllabus:			
Sr. No	Name of chapter & Details		Session Allotted
SECTION-I			
1	<ul style="list-style-type: none"> ○ What is Entrepreneurship? ○ Who is an entrepreneur? ○ Concepts of entrepreneurship and innovation, ○ Myths and approaches to entrepreneurship, ○ The Entrepreneurial perspective, ○ Entrepreneurship in India and prospects, ○ Evolution of entrepreneurship, ○ Case studies of entrepreneurial successes, ○ Startup India and other government policies and programs , ○ Financial support for entrepreneurship and innovation 		22
2	<ul style="list-style-type: none"> ○ Importance of innovation, ○ the innovation process, ○ cases of innovation, ○ how to engineer an innovative product. 		
3	<ul style="list-style-type: none"> ○ Human Resource Management for startups, ○ Entrepreneurial Leadership, ○ legal aspects of entrepreneurship, ○ entrepreneurship marketing, 		
SECTION-II			
4	<ul style="list-style-type: none"> ○ finance in entrepreneurship, ○ Operations and Production management, ○ case study submissions 		23
5	<ul style="list-style-type: none"> ○ Initial idea conceptualization ○ Creativity & Business Ideas: ○ Creativity: Concept & Features of creative people ○ Sources and Techniques of New Ideas 		
6	<ul style="list-style-type: none"> ○ Sample Business plan knowhow, ○ Live development of B-Plan as a group activity ○ presentation skills 		

Students Learning Outcomes:

At the end of this course, students will be able to:

1. Relate and apply various entrepreneurial concepts and business theories in practical context
2. Understand the process of creating a business idea and its implementation
3. Be aware about the basic principles and requirements of being an entrepreneur and how to be one
4. Get inspired for taking up entrepreneurship as a career option

Text book:

1. Entrepreneurship –Theory, Process and Practice –Donald Kuratko & Hodgetts

Reference Books:

1. Entrepreneurship creating and leading an entrepreneurial organization
By Arya Kumar, Pearson Education
2. Entrepreneurship-Hisrich Robert D. & Peters Michael P., Tata McGraw-Hill
3. The Dynamics of Entrepreneurial Development and Management -Vasant Desai

Additional Resources:

Books:

- "The Effective Executive" by Peter Drucker
- "The startup Playbook " by David S Kidder

Websites:

- www.entrepreneur.com
- <http://www.ted.com/>
- <http://www.allbusiness.com/>
- <http://www.noobpreneur.com/>
- <http://yourstory.com/>



SYLLABUS

Course Title	Basics of Computer Applications
Course Code	CE451
Course Credit	Lecture : 03
	Tutorial : 00
	Practical : 00
	Total : 03

Detailed Syllabus:

Sr. No	Name of chapter & Details	Session Allotted
SECTION-I		
1	Computer Fundamentals: Introduction to Computers, Applications, History, Computer Organization, Input and Output Devices, Storage Devices, Classification of Computers, Hardware & Software	22
2	Introduction to Operating System, Windows & its Utilities Introduction to Operating System- Functions of Operating Systems and their characteristics DOS Introduction, Basic DOS commands Windows Introduction to Windows, Features of Windows, Types & Versions Overview of File System, Basic operations with File System Working with Control Panel Creation of Users, Installation/Un-Installation of Applications, Drivers	
3	Working with Office Document Writer Creating, Editing & Navigating, Formatting, Working with Table, Mail Merge, Macros. Spreadsheet Working with Sheets, Formatting Sheets, Data Filters, Formulas, Graphs & Charts, Analyzing Data, Macros. Presentation Creating Presentation, Designing, Editing, Animation, Inserting Sounds, Movies and Charts, Usage of Hyperlinks.	
4	Networking and Internet Computer Network, Networking Devices & Technologies, Introduction to Internet, Web Surfing, Overview of Browsers,	

	Email Providers, Creating & Working with Emails, Email Groups, Video Conferences	
SECTION-II		
5	Google Apps – I Moving from Office to Google Drive Google docs: Creating Document, Upload, Edit Document, Sharing, Limitation of Google Docs. Google sheets: Creating Sheets, Upload, Edit Sheets, Sharing, Limitation of Google Sheets. Google slide: Creating Slide, Upload, Edit Slide, Sharing, Limitation of Google Slide.	23
6	Google Apps - II Google Calendar: Creating and Viewing Events, Inviting others, Notifications Google Forms: Usage of Various Components, Designing & Sharing Google Sites: Introduction to Templates, Creating/Editing Pages, Publishing Sites	
7	Google Apps - III Google Classrooms: Capturing your Classroom's, Communicating with students Google Maps, Exploration of Google Earth Usage of Google Groups to Promote Online Discussion	
8	Applications & Online Tools Working with pdf, Conversion from pdf into various formats Basics of Origin - Graphing, Exploration of Data, Analysis of Data E-Books, Online Videos, Edmodo, Canvas	
Instructional Method and Pedagogy:		
<ol style="list-style-type: none"> Lectures will be conducted on the basis of Classroom Response Systems with the use of multimedia projector and black board. Assignments based on course contents will be given at the end of each unit/topic and will be evaluated at regular interval. Experiments will be based on the practical curriculum and will be evaluated at regular interval 		
Students Learning Outcomes:		
On the completion of the course, students will be able to : <ul style="list-style-type: none"> Explore the fundamental of computer, hardware, software. Demonstrate proficiency in the use of email. Compose various documentation skills of open office and Google collaboration tools in daily routine work. Adapt data management and manipulation skills in daily routine work. 		
Text book:		
<ol style="list-style-type: none"> Title : Microsoft Office 2007 Bible, Wiley India New Delhi Author(s): Walkenbach John Tyson Herb Wempen Faithe Prague Cary, N. Groh Michael, R. Aitken Peter, G. Bucki Lisa. Title : The Internet, Prentice Hall of India Publication Author(s) : Douglas E. Comer. 		

Reference Books:

1. Title : Learn Microsoft Office 97, BPB Publications New Delhi Author(s): Russell Stuart.
2. Title : Google Drive & Docs in 30 Minutes (2nd Edition): The unofficial guide to the new Google Drive, Docs, Sheets & Slides by IAN IAMONT

Additional Resources:

1. www.originlab.com
2. www.officetutorials.com
3. <https://gsuite.google.com/learning-center>
4. <http://www.basicknowledge101.com/subjects/internet.html>