SEMESTER VI

GBBT-601 MOLECULAR DIAGNOSTICS

Course Objectives:

1. Immunoassays, conjugation of enzymes, Homogeneous and heterogeneous enzyme immunoassays, Applications of enzyme immunoassays in diagnostic
2. Applications of PCR, RFLP, Nuclear hybridization methods
3. Rrapid diagnostic approach including technical purificationand standardization of antigen and specific antibodies
4. Familiar with various techniques like HPLC, Flowcytometry, Immunoflorescence, cell sorting etc.
5. Students will able to perform various diagnostic tests in the laboratory, which will be helpful for their future job prospective.

Course Contents:

UNIT I

Enzyme Immunoassays:

Comparison of enzymes available for enzyme immunoassays, conjugation of enzymes. Solid phases used in enzyme immunoassays. Homogeneous and heterogeneous enzymeimmunoassays.Enzyme immunoassays after immuno blotting. Enzyme immunohistochemical techniques. Use of polyclonal or monoclonal antibodies in enzymes immuno assays. Applications of enzyme immunoassays in diagnostic microbiology

UNIT II

Molecular methods in clinical microbiology:Applications of PCR, RFLP, Nuclear hybridization methods, Single nucleotide polymorphismand plasmid finger printing in clinical microbiology

Laboratory tests in chemotherapy:Susceptibility tests: Micro-dilution and macro-dilution broth procedures. Susceptibilitytests:Diffusion test procedures. Susceptibility tests: Tests for bactericidal activity. Automatedprocedures for antimicrobial susceptibility tests.

UNIT III

Automation in microbial diagnosis, rapid diagnostic approach including technical purification and standardization of antigen and specific antibodies. Concepts and methods in idiotypes. Antiidiotypes and molecular mimicry and receptors.Epitope design and applications.Immunodiagnostictests.Immunoflorescence.Radioimmunoassay.

UNIT IV

GLC, HPLC, Electron microscopy, flowcytometry and cell sorting.Transgenic animals.

SUGGESTED READINGS:

1. Practical Biochemistry, Principles and Techniques, Keith Wilson and John Walker
2. Bioinstrumentation, Webster
3. Advanced Instrumentation, Data Interpretation, and Control of Biotechnological Processes, J.F. Van Impe,Kluwer Academic
4. Ananthanarayan R and Paniker CKJ. (2005). Textbook of Microbiology. 7th edition (edited by Paniker CKJ). University Press Publication.
5. Brooks GF, Carroll KC, Butel JS and Morse SA. (2007). Jawetz, Melnick and Adelberg's Medical Microbiology.24th edition.McGraw Hill Publication.
6. Goering R, Dockrell H, Zuckerman M and Wakelin D. (2007). Mims' Medical Microbiology. 4th edition.Elsevier.
7. Joklik WK, Willett HP and Amos DB (1995). Zinsser Microbiology.19th edition. Appleton-Centuary-Crofts publication.
8. Willey JM, Sherwood LM, and Woolverton CJ.(2008). Prescott, Harley and Klein'sMicrobiology.7th edition.McGraw Hill Higher Education.
9. Microscopic Techniques in Biotechnology, Michael Hoppert

GBBT-602 BIOTECHNOLOGY IN HUMAN WELFARE & BIOETHICS

Course Objective:

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

1. What is Indian patent law, WTO and how it is related with IPR.
2. Ethical and depository considerations in biotechnology.

3. What entrepreneurship, how training in it help to select a product, and could have impact on bioeconomics of the product.
4. What bioethics are and why those are needed in research, national and international issues associated with these.
5. What is biosafety and guidelines for it, and concept of GLP and GMP.

Course Contents:

UNIT I

Industry: protein engineering; enzyme and polysaccharide synthesis, activity and secretion, alcohol and antibiotic formation.

UNIT II

Agriculture: N2 fixation: transfer of pest resistance genes to plants; interaction between plants and microbes; qualitative improvement of livestock.
Health: e.g. development of non-toxic therapeutic agents, recombinant live vaccines, gene therapy, diagnostics, monoclonal in *E.coli*, human genome project.

UNIT III

Environments: e.g. chlorinated and non-chlorinated organ pollutant degradation; degradation of hydrocarbons and agricultural wastes, stress management, development of biodegradable polymers such as PHB.

UNIT IV

Forensic science: e.g. solving violent crimes such as murder and rape; solving claims of paternity and theft etc. using various methods of DNA finger printing.

UNIT V

Bioethics – Necessity of Bioethics, different paradigms of Bioethics – National & International. Ethical issues against the molecular technologies.

SUGGESTED READING

1. Sateesh MK (2010) Bioethics and Biosafety, I. K. InternationalPvt Ltd.
2. Sree Krishna V (2007) Bioethics and Biosafety in Biotechnology, New age international publishers

GBBT-603 MEDICAL MICROBIOLOGY

Course Objective:

1) Thecourse is designed to enhance student knowledge on morphology, pathogenesis, symptoms, laboratory diagnosis, and preventive measures of different gram positive bacteria.
2) The students will get an insight on normal microflora of human body and infections caused by them.
3) On completion of this course, students knowledge on morphology, pathogenesis, symptoms, laboratory diagnosis, preventive measures and chemotherapy with regards to gram negative bacteria will be increased.
4) The objective of this course is to understand the different common diseases caused by viruses.
5) After the completion of this course, students will learn about different fungal and protozoan infections in human

Course Content:

UNIT I

Introduction: Normal microflora of human body, nosocomial infections, carriers, septic shock, septicemia, pathogenicity, virulence factors, toxins, biosafety levels.
Morphology, pathogenesis, symptoms, laboratory diagnosis, preventive measures and chemotherapy of gram positive bacteria: *S.aureus, S.pyogenes, B.anthracis, C.perferinges, C.tetani, C.botulinum, C.diphtheriaeM.tuberculosis, M. leprae.*

UNIT II

Morphology, pathogeneis, symptoms, laboratory diagnosis, preventive measures and

chemotherapy caused by gram negative bacteria: *E.coli, N. gonorrhoea, N. meningitidis, P. aeruginosa, S. typhi, S. dysenteriae, Y. pestis, B. abortus, H. influenzae, V. cholerae, M. pneumoniae, T. pallidum M. pneumoniae, Rickettsiaceae, Chlamydiae.*

UNIT III

Diseases caused by viruses- Picornavirus, Orthomyxoviruses, Paramyxoviruses, Rhabdoviruses, Reoviruses, Pox virus, Herpes virus, Papova virus, Retro viruses (including HIV/AIDS) and Hepatitis viruses.

UNIT IV

Fungal and Protozoan infections.Dermatophytoses (*Trichophyton, Microsporun and Epidermophyton*) Subcutaneous infection (*Sporothrix, Cryptococcus*), systemic infection (*Histoplasma, Coccidoides)* and opportunistic fungal infections (*Candidiasis, Aspergillosis*), Gastrointestinal infections (Amoebiasis, Giardiasis), Blood-borne infections (Leishmaniasis, Malaria)

SUGGESTED READINGS

1. Brooks GF, Carroll KC, Butel JS and Morse SA. (2007). Jawetz, Melnick and Adelberg's Medical Microbiology.24th edition.McGraw Hill Publication.
2. Goering R, Dockrell H, Zuckerman M and Wakelin D. (2007). Mims' Medical Microbiology. 4th edition.Elsevier. .
3. Willey JM, Sherwood LM, and Woolverton CJ.(2008). Prescott, Harley and Klein'sMicrobiology.7th edition.McGraw Hill Higher Education.

GBBT-604 DISSERTATION

The dissertation/project work must be accompanied by suitable lab techniques and should not only comprise of simple surveys or documentation. It will be monitored for its progress every month till the completion of the work (Total minimum period for the project will be 6 months). After the completion of the work, bound form of thesis should be submitted to the School of Life & Allied Health Sciences for evaluation. The evaluation will be based on the seminar presentation, viva voce and other suitable methods/modifications time to time.