

Institute of Bioscience & Biotechnology
Department of Biochemistry

NEW SYLLABUS

SEMESTER	Paper code	Title	Marks
FIRST	BCH 101	General Biochemistry	100
	BCH 102	Cell Biology And Membrane Biochemistry	100
	BCH 103	Biophysical Chemistry, Techniques & application	100
	BCH 104	General Microbiology	100
	Practical		100
SECOND	BCH 201	Bioenergetics and intermediary metabolism	100
	BCH 202	Enzymology	100
	BCH 203	Plant Biochemistry	100
	BCH 204	Biostatistics, computer application and IPR	100
	Practical		100
THIRD	BCH 301	Physiology and clinical Biochemistry	100
	BCH 302	Molecular Biology	100
	BCH 303	Immunology	100
	BCH 304	Advanced Biotechnology	100
	Practical		100
FOURTH	BCH 401	Environmental Biochemistry	100
	BCH 402	Bioinformatics	100
		Elect any one (A or B or C)	100
	BCH 403 A	Industrial Biochemistry	
	BCH 403 B	Human Genetics	
	BCH 403 C	Biochemical Engineering and Fermentation Technology	
	BCH-404	Project/ Dissertation	200
	BCH-405	MOOCs	Grade

[Signature]
11/10/19

[Signature]
11.10.19

[Signature]
11/10/19

[Signature]
11.10.19

INSTITUTE OF BIOSCIENCES AND BIOTECHNOLOGY
DEPARTMENT OF ENVIRONMENTAL SCIENCES
M.Sc.-Environmental Science Course Content

Semester Ist			
S.No.	Paper Code	Name of paper	Max. Marks
1	ENV-101	Basics of Environment	100
2	ENV-102	Fundamental of Ecology	100
3	ENV-103	Natural Resources and their Management	100
4	ENV-104	Conventional and Non-Conventional Energy Resouces	100
5	ENV-105	Practical	100
Semester IInd			
1	ENV-201	Environmental Chemistry	100
2	ENV-202	Instrumentation	100
3	ENV-203	Soil Science	100
4	ENV-204	Biostatistic and Computer Applications	100
5	ENV-205	Practical	100
Semester IIIrd			
1	ENV-301	Environmental Toxicology	100
2	ENV-302	Environmental Microbiology and Biotechnology	100
3	ENV-303	Environmental law and Sustainable Development	100
4	ENV-304	Environmental Pollution and Control	100
5	ENV-305	Practical	100
Semester IVth			
1	ENV-401	Environmental Impact Assessment & Auditing	100
2	ENV-402	Meteorology and Remote Sensing	100
ELECT ANY ONE (3.1 to 3.3)			
3.1	ENV-403	Pollution monitoring and Bioremediation	100
3.2	ENV-404	Environmental Hazards and Disasters	100
3.3	ENV-405	Environmental and Occupational Health	100
4	ENV-406	Dissertation/Project/summer training/review of literature and tour report	150+50=200

Y. K. Reddy
23-1-19

Alia
23/10/19

Dr. J
23/10/2019

**Department of Biotechnology
Institute of Biosciences and Biotechnology
Chhatrapati Shahu Ji Maharaj University**

**M.Sc. Syllabus Biotechnology
M.Sc.Ist Semester**

Paper	Name of the Paper	Maximum Marks
MBT-101	Cell and Developmental Biology	100
MBT-102	General Biochemistry	100
MBT-103	Biophysical Chemistry and Techniques	100
MBT-104	Fundamentals in Biostatistics and Biomathematics	100
MBT-105	Practical	100

M.Sc. IInd Semester

Paper	Name of the Paper	Maximum Marks
MBT-201	Molecular Biology and Genetics	100
MBT-202	Microbiology	100
MBT-203	Physiology and Metabolism	100
MBT-204	Computational Biology and Bioinformatics	100
MBT-205	Practical	100

M.Sc.IIIrd Semester

Paper	Name of the Paper	Maximum Marks
MBT-301	Cellular and Molecular Immunology	100
MBT-302	Principles of Genetic Engineering	100
MBT-303	Plant Biotechnology and Tissue culture	100
MBT-304	Enzymology and Enzyme Technology	100
MBT-305	Practical	100

M.Sc.IVth Semester

Paper	Name of the Paper	Maximum Marks
MBT-401	Animal Cell Culture, Medical and Microbial Biotechnology	100
MBT-402	Genomics, Proteomics, Intellectual Property rights, Product Regulation and Biosafety	100
MBT-403A	Industrial Biotechnology	100
	OR	
MBT-403B	Environmental Biotechnology	100
	OR	
MBT-403C	Drug Discovery and Development	100
	OR	
MBT-403D	Nanobiotechnology	100
MBT-404	Project Viva	200

[Signature]
16.2.2019

[Signature]
16/02/19

[Signature]
16.2.19

[Signature]
16/2/19

M.Sc. FOOD TECHNOLOGY

Course Structure-at a Glance

Ist Semester

Paper Code	Course Title	Marks
MFT 101	Principles of Food Processing	100
MFT 102	Food Chemistry	100
MFT 103	Instrumentation & Analytical Techniques	100
MFT 104	Research Methodology, Statistics & Computer application	100
	PRACTICAL	100
Total Marks		500

IInd Semester

MFT 201	Post- Harvest Technology of Horticultural Crops	100
MFT 202	FOOD MICROBIOLOGY	100
MFT 203	PACKAGING OF FOOD MATERIALS	100
MFT 204	PRINCIPLES OF FOOD ENGINEERING	100
	PRACTICAL	100
Total Marks		500

IIIrd Semester

MFT 301	Processing of Cereals, Pulses & oilseeds	100
MFT 302	Processing of Milk & Milk Products	100
MFT 303	Processing of Milk & Milk Products	100
MFT 304	Entrepreneurship in Food Processing	100
	PRACTICAL	100
Total Marks		500

IVth Semester

MFT 401	INDUSTRIAL FOOD FERMENTATION	100
MFT 402	TECHNOLOGY OF MEAT, FISH AND POULTRY	100
MFT 403	FOOD PLANT SAFETY AND WASTE MANAGEMENT	100
MFT 404	Dissertation and Project	200
MFT 405	MOOC Compulsory (any one out of available choices)	Grading System: Pass or Fail
Total Marks		500
Grand Total Marks		2000

**REVISED SYLLABUS: MSc MICROBIOLOGY, CSJM UNIVERSITY,
KANPUR**

COURSE	TITLE	MARKS
SEMESTER I		
MIC 101	GENERAL MICROBIOLOGY	100
MIC 102	BIOCHEMISTRY	100
MIC 103	ANALYTICAL TECHNIQUES AND BIOSTATISTICS	100
MIC 104	CELLULAR MICROBIOLOGY	100
MIC 105	PRACTICALS	100
	TOTAL	500
SEMESTER II		
MIC 201	BACTERIAL METABOLISM AND PHYSIOLOGY	100
MIC 202	FUNDAMENTALS OF MOLECULAR BIOLOGY	100
MIC 203	RECOMBINANT DNA TECHNOLOGY	100
MIC 204	VIROLOGY	100
MIC 205	PRACTICALS	100
	TOTAL	500
SEMESTER III		
MIC 301	MICROBIAL TECHNOLOGY	100
MIC 302	MICROBIAL GENETICS	100
MIC 303	CELLULAR AND MOLECULAR IMMUNOLOGY	100
MIC 304	AGRICULTURE AND ENVIRONMENT MICROBIOLOGY	100
MIC 305	PRACTICALS	100
	TOTAL	500
SEMESTER IV		
MIC 401	INDUSTRIAL MICROBIOLOGY	100
MIC 402	MEDICAL MICROBIOLOGY	100
MIC 403A (Elective)	FOOD MICROBIOLOGY	100
MIC 403B (Elective)	MICROBIAL GENOMICS, PROTEOMICS AND BIOINFORMATICS	100
MIC 404	PROJECT	200
MIC 405	MOOC- Compulsory (Any one out of the available options)	Grade
	TOTAL	500
	GRAND TOTAL	2000

Manish
10.10.19

Nal
10/10/19
(Prof. Nand Lal)

10/10/2019
P. Kalyan

M.Sc. Nutrition Science
Course Structure-at a Glance

Ist Semester

Paper Code	Course Title	Marks
MNS 101	APPLIEDPHYSIOLOGY	100
MNS 102	NUTRITIONALBIOCHEMISTRY	100
MNS 103	ADVANCEDNUTRITION	100
MNS 104	ADVANCESINFOOD MICROBIOLOGY	100
	PRACTICAL	100
Total Marks		500

IInd Semester

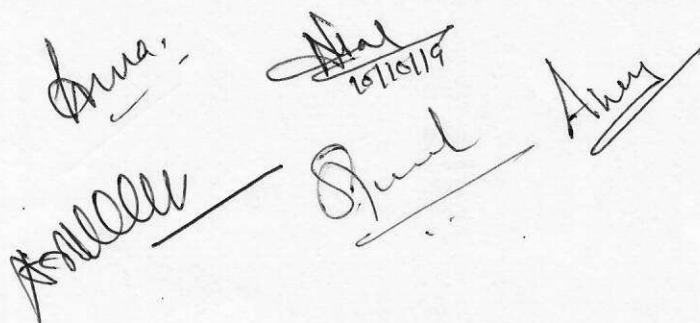
MNS 201	RESEARCH METHODOLOGY STATISTICS & COMPUTER APPLICATION	100
MNS 202	FOODSCIENCE	100
MNS 203	TECHNIQUES OF FOOD ANALYSIS	100
MNS 204	NUTRITION DURING LIFE CYCLE	100
	PRACTICAL	100
Total Marks		500

IIIrd Semester

MNS 301	THERAPEUTIC NUTRITION AND DIETITICS	100
MNS 302	FOOD PROCESSING & TECHNOLOGY	100
MNS 303	FOOD SERVICE MANAGEMENT	100
MNS 304	COMMUNITY NUTRITION	100
	PRACTICAL	100
Total Marks		500

IVth Semester

MNS 401	FOOD PRODUCT DEVELOPMENT	100
MNS 402	ADVANCED DIETETICS	100
MNS 403	NUTRITION FOR HEALTH & FITNESS	100
MNS 404	DISSERTATION/ PROJECT	200
MNS 405	MOOC Compulsory (any one out of available choices)	Grading System: Pass or Fail
Total Marks		500
Grand Total Marks		2000



 [Signature] 16/10/19

 [Signature]

 [Signature]

 [Signature]

Goals and objectives of course:

To develop highly qualified professional manpower the basic requirement lies on systematic quality based coaching and training in Advanced Science and Technologies for Environment, Health, and Safety management. Therefore, the course is designed to train and provide expert human resource to Environment, Health, and Industrial Safety management and expected to bring direct benefits to industry and society.

Course for P.G. Diploma in Industrial Safety and Occupational Health Management

Semester -I					
Course code	Course paper	Credit	Marks		Maximum marks
			SEE	ISA	
ISOHM-101	Principle of Industrial Safety	4	70	30	100
ISOHM-102	Industrial Hygiene and Occupational Health	4	70	30	100
ISOHM-103	Environmental Impact Assessment and Monitoring	4	70	30	100
ISOHM-104	Industrial Safety Legislation and Managements	4	70	30	100
ISOHM-105	Practical based on theory papers	2			100
Semester -II					
ISOHM-201	Project report/dissertation/ Industrial tanning/ Internship	6	-		200
	Total credit	24	Total marks		700

ISA – Intra Semester Assessment, SEE- Semester End Examination

Contact Number: Dr Dharam Singh 6307872264

HUMAN GENETICS

UNIT-I Introduction to Human Genetics: History; Early perception, development and documentation; Genome organization; Chromosome structure, function and implications for disease. Study tools in Human Genetics: Pedigree analysis- Mendelian inheritance and exceptions; Chromosomal analysis (in vitro, in vivo), Biochemical analysis; Somatic cell genetics (somatic cell hybrids, monochromosome hybrid panels, gene mapping); Molecular genetic analysis.

UNIT-II Human genome mapping methods: Physical mapping: Introduction to physical map markers Chromosomal, G/Q- banding, radiation hybrid, Fluorescence in situ hybridization, comparative genome hybridization, long range restriction mapping, high resolution mapping STS/EST/MS/SNP/sequencing; Genetic mapping: Linkage analysis (RFLP/MS/SNP); Applications of mapping in normal and disease genome analysis; Gene identification using positional and functional cloning approach.

UNIT-III Human genome analysis: Conception, mapping, cloning and sequencing, Outcome- Generation of 'OMICS' era, significant leads. Genetic variation in health and disease: Human genetic diversity- Methods of study – Biochemical/molecular genetic markers; some examples. Tracing human migrations with autosomal, Y-chromosomal and mitochondrial markers.

UNIT-IV Diseases and disorders: Chromosomal disorders: Structural and numerical; Autosomal/sex chromosomal/sex reversal; Mechanisms – mitotic/meiotic non-disjunction/ chromosomal rearrangements; Some examples (Syndromes/Cancer/Infertility); Single gene and disease: Inborn errors of metabolism, Haemoglobinopathies; Multifactorial disorders: Introduction; Methods of study (Epidemiological, Twin/ adoption and Family studies); Etiology - genetic and non-genetic determinants; Common examples.

UNIT-V Epigenetics and disease: Mechanisms (Imprinting/methylation; chromatin remodeling); Current understanding; examples. Mitochondrial myopathies. Ethical, legal and social issues in Human genetics: Prenatal/adult (individual/family/population) screening of mutation/risk factor for genetic diseases; Confidentiality/privacy, Discrimination, Ethical dilemma, Human rights, Surrogate mothers; Human cloning and eugenics; Organ banking and transplantation; Research ethics; Medical ethics in India.

[Signature]
11/10/19

[Signature]
11.10.19

[Signature]
11/10/19

[Signature]
11.10.19

SEMESTER IV

PAPER-I (BCH 401)

MAX.MARKS-100

ENVIRONMENTAL BIOCHEMISTRY

- UNIT-I** Introduction of ecology, Environmental factors. Biosphere, food web, trophic level and their pyramids. Ecosystem – types, development and evolution, habitat and niche. Concept of productivity and standing crops. Biome ecological indicators, ecology efficiency, edge effect, Biogeochemical cycles.
- UNIT-II** Population ecology – definition and characters. Regulation of population size by density dependent and independent factors. Quantative analysis of plant community. Biotic community – characteristics of community. Ecological succession.- causes sera climax community. Primary and secondary succession, Evolutionary ecology.
- UNIT-III** Pollution – air, water, lignin, detergent, dyes, heavy metal, drugs, Industrial waste effluents (pulp, sugar, and paper mills), and pollution control device impact analysis of some common pollutants. Harmful effects of rays – UV, gamma, ozone layer, ozone holes, greenhouse effect. Degradation: environmental biodegradable pollutants, non-degradable pollutants Treatment of waste water and industrial effluent.
- UNIT-IV** Metabolism and Toxicity of agro and industrial chemical to plants and animals. Toxicology of free radicals and its scavengers. Xenobiotics, Bioremediation, Vermiculture Biochemical aspects environmental Monitoring and ecosystem analysis.
- UNIT-V** Detection of Toxic exposure: acute Toxicity, chronic and sub acute exposure and their tests. Testing agents for carcinogenic, mutagenic and teratogenic action. The basis of antidotal procedures.

[Signature]
11/10/19

Neelga.
11.10.19

Atal
11/10/19

C. Kalyan
11.10.19

ENV-405: Environmental and Occupational Health

Max. Marks: 100

Basic principles of environmental health, Physiological responses of man to relevant stresses in the environment. Industrial Toxicology: Study of environmental does effects relationships. Evaluation of toxicity and threshold limits. Principles and methods of occupational health; The relationship of occupation of hygiene, safety and disease. Health maintenance: Survey analysis and recommendations regarding health, and safety problems in the working/living environment. Bio-statistics, epidemiology; Applications of statistical methods of medical records in the study of health problems of human pollution in a given environment. Treatment of variation with demographic, vital statistics and epidemiological data; Hazard evaluation in polluted environment with specific emphasis on radiological health. Industrial hygiene technology-laboratory remains illustrating the principals, methods of recognizing evaluating and controlling environmental hazards like air pollution, etc.

Recent initiations**ENV-406: Dissertation /Project/Summer Training**

Max. Marks: 200


Head
Department of Environmental Science
Institute of Biosciences and Technology
K. J. Somaiya Institute of Engineering and Information Technology, Gandhinagar, Mumbai

DEPARTMENT OF ENVIRONMENTAL SCIENCES
MSc. COURSE SYLLABUS

Semester Ist

ENV 101: Basics of Environment

Max. Marks: 100

Definition, Principles and Scope of Environmental Sciences; Earth, Man and Environment; Atmosphere: Structure and composition, Hydrosphere, Lithosphere and Biosphere; **Ecosystem: Concept of Ecosystem, Energy flow in Ecosystem**, Food chain, food web, Ecological pyramids. Biogeochemical cycle viz.: Carbon cycle, Nitrogen cycle, Hydrological cycle, Phosphorous cycle and Sulphur cycle. Interaction of Biological System with Physical Environment and among themselves; Common flora and fauna in India; **Rocks: Igneous, Metamorphic and Sedimentary rock, Rock minerals, Rock cycle. Soil: Basic concept of soil, soil profile, soil flora and fauna, absorption and loss of heat, law of thermodynamics, Thermal conductivity through the soil profile, desertification, causes, consequences, soil erosion and control.**

Recent initiations

ENV102: Fundamental of Ecology

Max. Marks: 100

History and scope of Ecology, Autecology, Synecology, Population characteristics and dynamics, Community, Biome, Environmental factors (Abiotic medium, substratum, soil humidity, climate, water, light, temperature, current and pressure, atmospheric gases, pH and nutrients their importance and role). Limiting factors (Liebig's law of minimum, Shelford's law of tolerance), combined concept of limiting factors. Biotic factors: **mutualism, commensalism, parasitism, competition**. Distinguishing characters of forest grasslands, wetlands and arid lands, community organization, concept of habitat, functional role and niche, dominant species, keystone species, ecotone, edge effect; **tolerance range and carrying capacity**; Ecological succession, primary & secondary processes of successions, models of successions, climax community and type of climax.

Recent initiations

Dr. M. J.
Head
Department of Environmental Sciences

ENV103: Natural Resources and their Management

Max. Marks: 100

Definition and classification of natural resources; Water resources: Fresh and marine water, **causes of scarcity**, management and conservation, water budget. The land: **classification**, land used **pattern, policy** and management. Land degradation: causes and their management, Classification, **causes** and their management, integrated land planning. **Waste land and their reclamation**; Mineral resources: **metallic and nonmetallic minerals, geographical distribution**, exhaustibility, development and preservation. Forest: classification, importance, causes of depletion and degradation, **consequences**, conservation and management, National forest programme (NFP), A-forestation, social and agro-forestry. Wild life: definition, ecological balance, importance, **ethical value, wild life reserves, geographical distribution of wild life**, causes of depletion and extinction of wild life, wild life management, **protected areas**, Biological diversity: definition, types, **hot spots, Biogeographic Zones in India**, natural and anthropogenic causes of depletion, red data book, rare, endangered, threatened and near extinct species, biodiversity conservation.

Recent initiations

ENV-303: Environmental law and Sustainable Development

Max. Marks: 100

National environmental policy statement on abatement of pollution legislation; Forest conservation Act-1980, **Indian Forest Act-1927**; Water (Prevention and control of pollution) Act-1974; Environmental **protection Act 1986**; **Air (Prevention and control of pollution) Act-1981**; **Noise pollution (Regulation and Control) rules-2000**; Hazardous waste (Management and handling) rules-1989; **Biomedical waste (Management and handling) rules-1998**; **E-waste (Management and handling) rules -2011**; Wild life protection Act-1972; **Biodiversity Act-2002**; **The Prevention of Cruelty to Animals Act, 1960**, **National green tribunal Act-2010**; **Case study to be taken up M.C. Mehta vs Union of India Ganga river pollution, 1998**; Manufacture, use, import, export and storage of hazardous microorganisms; Scheme for labeling of environmental friendly products (Eco-mark scheme); Public liability Insurance Act-1991; National and International organizations dealing with environmental issues; Famous environmental conventions.

Recent initiations

ENV-405: Environmental and Occupational Health

Max. Marks: 100

Basic principles of environmental health, Physiological responses of man to relevant stresses in the environment. Industrial Toxicology: Study of environmental does effects relationships. Evaluation of toxicity and threshold limits. Principles and methods of occupational health; The relationship of occupation of hygiene, safety and disease. Health maintenance: Survey analysis and recommendations regarding health, and safety problems in the working/living environment. Bio-statistics, epidemiology; Applications of statistical methods of medical records in the study of health problems of human pollution in a given environment. Treatment of variation with demographic, vital statistics and epidemiological data; Hazard evaluation in polluted environment with specific emphasis on radiological health. Industrial hygiene technology-laboratory remains illustrating the principals, methods of recognizing evaluating and controlling environmental hazards like air pollution, etc.

Recent initiations**ENV-406: Dissertation /Project/Summer Training**

Max. Marks: 200

GE2 I.P.R. ENTREPRENEURSHIP BIOETHICS & BIOSAFETY

Paper Code (BBT 1004 [B])

(Credits: Theory-4, Practicals-2)

THEORY Lectures: 60

UNIT-I (10 Periods)

Introduction to Indian Patent Law. World Trade Organization and its related intellectual property provisions. Intellectual/Industrial property and its legal protection in research, design and development. Patenting in Biotechnology, economic, ethical and depository considerations.

UNIT II (10 Periods)

Entrepreneurship: Selection of a product, line, design and development processes, economics on material and energy requirement, stock the product and release the same for making etc. The basic regulations of excise: Demand for a given product, feasibility of its production under given constraints of raw material, energy input, financial situations export potential etc.

UNIT III (10 Periods)

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

UNIT IV (10 Periods)

Biosafety– Introduction to biosafety and health hazards concerning biotechnology. Introduction to the concept of containment level and Good Laboratory Practices (GLP) and Good Manufacturing Practices (GMP).

PRACTICALS

1. Proxy filing of Indian Product patent

Neha/
22/10/21

DSE2 ENVIRONMENTAL BIOTECHNOLOGY

Paper Code (BBT 5004)

(Credits: Theory-4, Practicals-2)

THEORY Lectures: 40

UNIT I (10 Periods)

Conventional fuels and their environmental impact – Firewood, Plant, Animal, Water, Coal and Gas. Modern fuels and their environmental impact – Methanogenic bacteria, Biogas, Microbial hydrogen Production, Conversion of sugar to alcohol Gasohol

UNIT II (10 Periods)

Bioremediation of soil & water contaminated with oil spills, heavy metals and detergents. Degradation of lignin and cellulose using microbes. Phyto-remediation. Degradation of pesticides and

1.1.1

1.1.1

1.1.1

33

other toxic chemicals by micro-organisms- degradation aromatic and chlorinated hydrocarbons and petroleum products.

UNIT III (10 Periods)

Treatment of municipal waste and Industrial effluents. Bio-fertilizers Role of symbiotic and asymbiotic nitrogen fixing bacteria in the enrichment of soil. Algal and fungal biofertilizers (VAM)

UNIT IV (10 Periods)

Bioleaching, Enrichment of ores by microorganisms (Gold, Copper and Uranium). Environmental significance of genetically modified microbes, plants and animals.

PRACTICALS

1. Calculation of Total Dissolved Solids (TDS) of water sample.
2. Calculation of BOD of water sample.
3. Calculation of COD of water sample.
4. Bacterial Examination of Water by MPN Method.

SUGGESTED READING

1. Environmental Science, S.C. Santra
2. Environmental Biotechnology, Pradipta Kumar Mohapatra
3. Environmental Biotechnology – Concepts and Applications, Hans-Joachim Jordening and Josef Winter

AECC2 ENVIRONMENTAL SCIENCES

Paper Code (BBT 2003)

(Credits 4: Theory-4)

Lectures: THEORY: 20

Unit 1 : Introduction to environmental studies (2 lectures)

Multidisciplinary nature of environmental studies; Scope and importance; Concept of sustainability and sustainable development.

Unit 2 : Ecosystems (6 lectures)

What is an ecosystem? Structure and function of ecosystem; Energy flow in an ecosystem; food chains, food webs and ecological succession. Case studies of the following ecosystems: a) Forest ecosystem b) Grassland ecosystem c) Desert ecosystem d) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

Unit 3 : Natural Resources (8 lectures)

Renewable and Non-renewable Resources, Land resources and land use change; Land degradation, soil erosion and desertification. Deforestation; Causes and impacts due to mining, dam building on

12/1
5/2/14

[Signature]

C. Kalay

environment, forests, biodiversity and tribal populations. Water: Use and over-exploitation of surface and ground water, floods, droughts, conflicts over water (International & Inter-state). Energy resources : Renewable and non renewable energy sources, use of alternate energy sources, growing energy needs, case studies.

Unit 4 : Biodiversity and Conservation (8 lectures)

Levels of biological diversity : genetic, species and ecosystem diversity, Biogeographic zones of India; Biodiversity patterns and global biodiversity hot spots, India as a mega-biodiversity nation; Endangered and endemic species of India, Threats to biodiversity : Habitat loss, poaching of wildlife, man-wildlife conflicts, biological invasions; Conservation of biodiversity : In-situ and Ex-situ conservation of biodiversity. Ecosystem and Biodiversity services: Ecological, economic, social, ethical, aesthetic and Informational value.

Unit 5 : Environmental Pollution (8 lectures)

Environmental pollution : types, causes, effects and controls; Air, water, soil and noise pollution, Nuclear hazards and human health risks, Solid waste management : Control measures of urban and industrial waste. Pollution case studies.

Unit 6 : Environmental Policies & Practices (7 lectures)

Climate change, global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture 2/2. Environment Laws: Environment Protection Act; Air (Prevention & Control of Pollution) Act; Water (Prevention and control of Pollution) Act; Wildlife Protection Act; Forest Conservation Act. International agreements: Montreal and Kyoto protocols and Convention on Biological Diversity (CBO). Nature reserves, tribal populations and rights, and human wildlife conflicts

GE1 BIOTECHNOLOGY AND HUMAN WELFARE

Paper Code (BBT 1004 [A])

(Credits: Theory-4, Practicals-2)

THEORY Lectures: 40

UNIT I (10 Periods)

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

UNIT II (10 Periods)

Agriculture: N₂ fixation: transfer of pest resistance genes to plants; interaction between plants and microbes; qualitative improvement of livestock.

UNIT III (10 Periods)

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 (05 Periods)

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 (05 Periods)

Health: e.g. development of non-toxic therapeutic agents, recombinant live vaccines, gene therapy, diagnostics, monoclonal in E.coli, human genome project.

PRACTICALS

(Wherever wet lab experiments are not possible the principles and concepts can be demonstrated through any other material or medium including videos/virtual labs etc.)

1. Perform of ethanolic fermentation using Baker's yeast

Vb1
23/1/24

MFT 403: Food Plant Safety and Waste Management

UNIT I

Industrial hygiene and safety aspects related to toxicity, noise, pressure, temperature, vibration, radiation etc.

UNIT II

Safety elements: site of layout, process stages. Risk analysis and assessment. Prevention of losses, pressure relief, provision for fire fighting release of hazardous material from tanks and pipes.

UNIT III

Relief system: Types and Location. Disaster planning and management regulation, legislation and government role related to safety of food plant.

UNIT IV

Characterization of waste water generated from food processing industries and its treatment by physical and chemical methods.

UNIT V

Biological oxidation: Activated sludge process, trickling filter, rotating biological contractor, lagoons, oxidation ditches. Anaerobic digestion and composting. Advanced water treatment system: use of membrane, ion exchange, electro dialysis, magnetic separation. Handling and disposal of sludge.

Reference Books

Plant sanitation for food processing and food service, Y H Hui, CRC publication

Principles of food sanitation, Norman G Marriott and Robert B Gravani

Food safety management Programms, Debby Newslow

MFT 404: Industry Training/ Project/ Dissertation

for *Handwritten signature*
200
of Nutrition Science