UNION CHRISTIAN COLLEGE
ALUVA-2

SSR 5th CYCLE 2023

Criterion 1

1.3.1 Curriculum Enrichment

Union Christian College, Aluva

Department of Biosciences

Cross cutting issues Syllabus portion

Criteria 1.3.1

B Sc Biological techniques &Specimen preparation

SEMESTER IV RESEARCH METHODOLOGY, BIOPHYSICS AND BIOSTATISTICS

BIOETHICS

Module IV 5 Hrs

Bioethics : Introduction, Animal rights and animal laws in India, Prevention of cruelty to animals Act 1960, Biodiversity Act 2003.

Concept of 3 R – conservation (Refined- to minimize suffering, Reduced – to minimize animals, Replaced – modern tools and alternate means), Animal use in research and education.

Laboratory animal use, care and welfare, Animal protection initiatives- Animal Welfare Board

of India, CPCSEA, ethical commitment. Working with human: Consent, harm, risk and benefits.

SEMESTER V. CORE COURSE 13

ENVIRONMENTAL BIOLOGY AND HUMAN RIGHTS

(54 Hrs)

MODULE 1 ECOSYSTEM 12 Hrs

Basic concepts of ecosystem Components of ecosystem: Abiotic (Sunlight, temperature, soil,

water, atmosphere) and Biotic components (Producers, consumers, decomposers), Ecological

pyramid- number, biomass, energy, **Functions of ecosystem**: Productivity-Food chain-Food web-

Energy flow-Laws of Thermodynamics.Types of Ecosystem: Terrestrial-Forest-Grassland-Desert Aquatic-Marine-Fresh water, Wetland &Biome **Concept of limiting factors:** Liebig's and

Shelford's laws of limiting factors.

Biogeochemical cycles: Concept, gaseous and sedimentary cycles, Carbon cycle, Nitrogen cycle. **Renewable resources (**solar,wind, hydroelectric, biomass and geothermal) **and Non renewable resources** (mineral and metal ore, fossil fuels)

MODULE 2 CONCEPTS OF POPULATION AND COMMUNITY 8 Hrs

Concept of population: Population attributes- Population growth forms, Basic concepts of growth

rates, density, natality, mortality, growth curves

Animal interactions: Positive- Commensalism- Mutualism-Protocooperation, Negative-Predation-

Parasitism-Competition-Antibiosis

Characteristics of a community: Species diversity- richness, eveness, stratification, dominance,

ecological indicators, Ecotone and Edge effect, Keystone species, Concepts of Ecological Niche and Guild, Ecological succession, community evolution- climax

MODULE 3 BIODIVERSITY AND ENVIRONMENTAL ISSUES 16 Hrs

Introduction to Biodiversity: Types of biodiversity- Alpha, Beta and Gamma diversity. **Concept**

and importance of Biodiversity: Levels of Biodiversity-Species diversity, Genetic diversity,

Microbial, Ecosystem diversity, India as a mega-diversity nation, Biodiversity hotspots**Global Environmental Issues:** Ozone depletion, Greenhouse effect, Global warming, Climate

change, Carbon trading, carbon credit; Carbon sequestration, Acid rain, Oil spills, Nuclear

accidents, IPCC/UNFCC.

National Environmental issues: Deforestation, forest fire, pollution(air, water, soil, noise thermal,

nuclear- brief account only) solid waste management, sewage, drinking water crisis and water

logging,

Toxic products and disaster: Types of toxic substances – degradable, non degradable, Impact on

human – case studies: Endosulphan tragedy, Bhopal disaster

Flood, drought, cyclone, earthquake and landslide (Management and mitigation)

Local Environmental issues: Landscape alteration, sand mining, quarrying, changing crop pattern,

conversion of paddy lands,

Threats to water resources of Kerala: Degrading Mangrove and wetland ecosystems of Kerala, RAMSAR sites, Marine ecosystem crisis- pollution, overfishing etc. Impact of tourism on

Environment.

MODULE 4 CONSERVATION OF BIODIVERSITY 12 Hrs

Protected area concept – Sanctuary, National Park, Biosphere reserve, Core Zone, Buffer Zone,

Corridor concept. Conservation reserves

Concept of threatened fauna – IUCN categories - extinct, extinct in the wild, criticallyendangered, endangered, vulnerable, near threatened, least concern and data deficient. Red and

Green Data Books.

Man–animal conflict (Tiger, Elephant, Dog, Monkey) – causes and concern

Water conservation- rainwater harvestiong, watershed management

Environment education

Environmental laws (Brief account only): The Water (Prevention and Control of Pollution) Act,

1974, The Air (Prevention and Control of Pollution) Act, 1981, Indian Forests Act (Revised) 1982.

The Environment (Protection) Act, 1986, Hazardous Wastes (Management and Handling) Rules,

1989, The Forest (Conservation) Act, 1980, The Wildlife Protection Act, 1972, Biodiversity Act,

2002.

MODULE 5 HUMAN RIGHTS 6 Hrs

Introduction, main concepts associated with Human Rights, Different types of human rights Manifestations & phenomena, Role of agencies in promoting human rights, Mechanisms for

checking violations of human rights, National human right commission, Constitutional provisions

related to Human rights.

M Sc Biotechnology

BT020302 ENVIRONMENTAL BIOTECHNOLOGY

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Module1

Xenobiotics, biological impacts of polychlorinated biphenyls and dioxans, synthetic polymers, alkylbenzyl sulphonates, hydrocarbons, chlorinated pesticides, heavy metals- Mercury, lead. Biomagnification of recalcitrant molecules Microbial infallibility, types of biodegradation, factors affecting biodegradation, enzymes involved in biodegradation, catabolic plasmids, super bugs, Biodegradation of Hydrocarbons, cellulose, lignin, and pesticides. Bioremediation strategies. **15**

Module II

Bacillus thuringiensis as a pesticide, viral pesticides. Biological fertilizers- biological nitrogen fixation: Mycorrhizae, AM, cyanobacteria, molecular mechanism of nitrogen fixation in root nodules, nonsymbiotic nitrogen fixation- C*lostridium*sp. Nif gene data base. Biosurfactants, Biofouling, Bioleaching**. 12**

Module III

Types of industrial effluents, characterization of the wastewater- Chemical Oxygen Demand, Biological Oxygen Demand, Total organic carbon, Nitrogen contents, Suspended Total

heterotrophic bacterial population. Bacteriological analysis of drinking water, E. coli as a water quality indicaror. Presumptive, completed, and confirmed test. Treatment strategies: Preliminary and primary phases. Secondary treatment: Aerobic biological treatment methods- Floc based and film based strategies. Activated sludge process and its different stages, Types. Trickling filter process, Rotating Biological contactor, Submerged aerobic filters, Fluidized Bed Reactor, Packed bed reactor, Oxidation lagoons. UASB20

Module IV

Tertiary treatment methods: Columns of activated and granulated charcoal, ion exchange methods, reverse osmosis, Nitrogen removal- air stripping, break point chlorination biological denitrification. Removal of phosphate- biological and other methods. Ultra and nanofiltration. Disinfection,- Chlorination, chlorination derived byproducts, chloramines, Copper- silver method, ozone, UV methods. Solid waste- Characterization and sorting of wastes. Treatment methods- Land fills, incineration, pyrolysis. Composting- stages in composting, Types of composting .Vermicomposting. DRANCO. .Anaerobic reactorsStages in anaerobic digestion, methanogens . Biogas generation. Household treatment strategies- septic tank, small scale composting using pot, pipe etc. **18**

Module V

Introduction to: Biofuels- biogas, syngas, biodiesel, ethanol. Bioelectricity, biocementation and biocement, Bioplastics- PHB, PLA, cellulose and protein based plastics. Green composite – starch based. Concept of green patent. Advantages of bioprocessing in space. Biological indicators, DNA barcoding. **10**

BT020302 RECOMBINANT DNA TECHNOLOGY

Module V Applications of recombinant DNA technology- Production and purification of recombinant proteins- insulin and somatostatin. Gene therapy. Metabolite engineering. Imparting new agronomic traits to plants to improve quality and quantity. Gene Silencing through RNA interference and antisense therapy. CRISPR-CAS 9 system. Gene Knockout. Animal pharming, nanoparticles for labeling, delivery of drugs, DNA and RNA. Bioethics: laws, possible hazards and merits to society or nature. 15

Fourth Semester MSc Biotechnology

ELECTIVE-4

BT80403 IPR, & BIOTECHNOLOGY

Course outcome:

The student will be able to understand:

Intellectual property and its different forms. The National and international approaches to

protect the IPR. The guidelines for biosafety. Genetic modification of food crops and animals

and the ethical issues.

Credit-4

Module I

Introduction to Intellectual Property. Types of IP: Patents, Trademarks, Trade dress, Copyright &Related Rights, Industrial Design, Traditional Knowledge, Geographical Indications. WTO regime -

consumer protection and plant genetic resources-GATT and TRIPS. Patent protection to GMO.

Objects of Intellectual property law. 15

Module II

Types of patents; Indian Patent Act 1970; Recent Amendments; Patent application- forms and

guidelines, fee structure, time frames; Filing of a patent application; Precautions before patenting disclosure/

non-disclosure; Types of patent applications: provisional and complete specifications;

Patent databases; Searching International Databases; Country-wise patent searches (USPTO, EPO,

India etc.). Rights of patent holder. Basmati rice patent issue: a Case study. 20

Module III

Introduction to Biosafety levels. Primary Containment for Biohazards; Recommended

Biosafety Levels for Infectious Agents and Infected Animals; Biosafety guidelines. Regulatory bodies

of India-RCGM and GEAC. 15

Module IV

GM crops- versus organic and traditional crops, global status of GM crops, genetic engineering of

Btbrinjal and Bt cotton , Golden rice, edible vaccines,. Advantages and disadvantages of GM foodsBiosafety and environmental safety concerns, Public perceptions, Environmental release of GMOs;

Genetically modified Organisms in India. Labeling of GM foods; 10

Module V

Ethical and legal implications of Human genome project, genetic testing and screening, stem

cell research , Bioweapons and bioterrorism. Patenting of gene, Patenting of microbes- International

Microorganism Deposit system of WIPO, 15

M Sc Bioinformatics

Fourth semester

BT800401 GENETIC ENGINEERING & IPR

Module 5 (15 hrs)

Introduction and the need for intellectual property right (IPR). Patent document, How to protect your inventions? Granting of patent Rights of a patent, how extensive is patent protection? Why protect inventions by patents? Searching a patent, Drafting of a patent,

Filing of a patent, Environmental impacts - Ethical issues - ethical committees - Commercialisation – Copy right – royalty. Intellectual property rights and patent law – Trade Related aspects of Intellectual Property Rights, Rights of Trademarks, Types of Trademarks, signs used in Trademarks, Geographical indications**.** Ethical Issues of Genetic Engineering.

Union Christian College, Aluva
Department of Electronics & Computer Maintenance

Criteria-1.3.1: Syllabus portions which include ethics

Ecosystems
Concept of an ecosystem, Structure and function of an ecosystem, Producers, consumers and decomposers, Energy flow in the ecosystem, Ecological succession Food chains, food webs and ecological pyramids, Introduction, types, characteristic features, structure and functions of the given ecosystem:- Forest ecosystem
Environmental Pollution
Definition 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 wastes, Role of an individual in prevention of pollution, Pollution case studies, Disaster management: floods, earthquake, cyclone and landslides.
E-Waste

E-waste growth- An overview, hazards of E-waste, what is E-waste, digital dump yard, how to minimize E-waste, Hazardous substances waste Electrical and Electronic Equipment, characteristics of pollutants, batteries, electrical and electronic components, plastic and flame retardants, circuit boards, pollutants in waste electrical and electronic equipment

E-Waste Recycling
Technologies for recovery of resources from electronic waste, resource recovery potential of e-waste, steps in recycling and recovery of materials-mechanical processing, technologies for recovery of materials.
Unit 1 - Human Rights
An Introduction to Human Rights, Meaning, concept and development – History of Human Rights-Different Generations of Human Rights- Universality of Human Rights- Basic International Human Rights Documents - UDHR , ICCPR,ICESCR.-Value dimensions of Human Rights
Unit 2 - Human Rights and United Nations
Human Rights co-ordination within UN system- Role of UN secretariat- The Economic and Social Council- The Commission Human Rights-The Security Council and Human rights- The Committee on the Elimination of Racial Discrimination- The Committee on the Elimination of Discrimination Against Women- the Committee on Economic, Social and Cultural Rights-
The Human Rights Committee- Critical Appraisal of UN Human Rights Regime.
Unit 3- Human Rights National Perspective
Human Rights in Indian Constitution – Fundamental Rights- The Constitutional Context of Human Rights-directive Principles of State Policy and Human Rights- Human Rights of Women-children –minorities- Prisoners- Science Technology and Human Rights- National Human Rights Commission- State Human Rights Commission- Human Rights Awareness in Education.

UNION CHRISTIAN COLLEGE, ALUVA

Department	MBA
Programme Name	Master of Business Administration
Level of study	PG
Semester	S3
Course Name/Subject Name	Business Ethics and Corporate Governance
Total Hours	30
Module 1:	Part of syllabus: INDIAN ETHOS FOR MANAGEMENT 1.1 Relevance of Indian Ethos and Values 1.2 Principles practiced by Indian Companies 1.3 Management Lessons from Vedas, Mahabharatha, Bible & Quran – An Overview - Kautilya's Arthashastra 1.4 Indian Heritage in Business Management – Production & Consumption
Module 2 :	Part of syllabus: INDIAN PRACTICES 2.1 Indian Vs Western Management 2.2 Work Ethos and Values for Indian Managers

	2.3 Stress Management – Meditation for Mental Health – Role and Importance of Yoga 2.4 Contemporary Approaches to Leadership 2.5 Indian System of learning – Gurukul System – Importance of Karma to Managers
Module 3 :	Part of syllabus: INDIAN VALUE SYSTEM 3.1 Work Ethos and Values for Indian Managers 3.2 Relevance of Value Based Management in Global Change – Importance of Value on Stakeholders 3.3 Value System in Work Culture 3.4 Secular Vs Spiritual Values
Module 4:	Part of syllabus: NEED FOR ETHICS 4.1 Understanding the Need for Ethics 4.2 Ethical Principles in Business 4.3 Theories of Ethics – Absolutism Vs Relativism 4.4 Kohlberg's Six Stages of Moral Development (CMD) 4.5 Managing Ethical Dilemma – Characteristics – Ethical Decision Making, Ethical Reasoning
Module 5 :	Part of syllabus: CORPORATE GOVERNANCE 5.1 Corporate Governance Initiatives in India – Committees & Commissions 5.2 Corporate Governance – Theories and Models – Corporate Disclosure –

	5.3 Corporate Social Responsibility (CSR) and its Significance in Business 5.4 Concept of Social Audit and its Relevance – Whistle Blowing – Privacy Trade Secrets 5.5Scams and Scandals in Corporate Governance in India

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