On Wed, 8 Jul 2020 at 15:17, Deepak Pathania <dpathania74@gmail.com> wrote:
Dear All
"Greetings'

It will find you in good health and high sprit

1. Due to COVID-19, the BoS meeting is not possible in physical mode. However, the Matrix of M.Sc III –IV Sem and Ph.D. with syllabi duly recommended by the Department syllabi review committee after incorporating the inputs/suggestions of faculty members and Ph.D. synopsis of three research scholar after approval of the Departmental Research Committee (DRC) is enclosed herewith for your kind perusal and "Approval on Circulation" please.
2. As the matter is urgent to avoid further delay (as Academic council meeting is scheduled on 27th July, 2020), it is requested through circulation for recommendation/approval of Agenda points.
3. Honorable members are requested to approve/Ratify by 10 July 2020 (upto 2PM) so that it could be further placed before the SB and AC for consideration and approval.
4. An early response and approval are requested. Non-receipt of response from honorable members up to the mentioned date, be understood to be approved.

Note: Dr Richa Kothari is requested as a special invitee for the approval and comments on the agenda items through circulation.

With Warm Regards

Dr. Deepak Pathania
Professor & Head
Dean, School of Life Sciences
Head, Department of Environmental Sciences
Central University of Jammu,
Bagla (Rahya Suchani), Distt. Samba, J&K - 181143
Mobile: +919805440648

Ex-Dean of Students' Welfare, CUJ, Jammu
EX-Dean of Basic Sciences, Shoolini University, Solan
Ex-Head, Dept. of Chemistry, Shoolini University, Solan

With Warm Regards

Forwarded message ---------
From: **Brijmohan Bhau** <bsbhau@gmail.com>
Date: Fri, Jul 10, 2020 at 4:16 PM
Subject: Re: Board of Studies meeting through coirculation regarding
To: Deepak Pathania <dpathania74@gmail.com>
Cc: <akkoul2003@yahoo.com>, Avinash Kumar <avinash.Kumar@erm.com>, <anilkul54@gmail.com>, sunil dhar <sunildhar99@yahoo.com>, Dr.Pankaj Mehta <drpankajmehta79@gmail.com>, richa kothari <richakothari786@gmail.com>

Dear Prof. Pathania ji,
Greetings.
After going through the Course Matrix and synopsis, I have some observations.

- **Environment Technology** paper should focus on different technologies used to address environmental issues. The syllabus is not justifying the title. Unit I & III should be replaced by some appropriate content. **Suggested Readings are without publishing year in many other course. Please try to add latest books/publications.**
- **Unit II & sub-unit 2.3. How vaccines & probiotics are related to environment?**
- **In Environmental Chemistry syllabus, Unit II has got sub numbers as 3.1 etc and for Unit 3 they are 4.1 etc.**
- **In Disaster Management syllabus 4.4 and 5.3 need to be reframed to avoid duplication.**
- **Environmental Laws, Policies and Ethics syllabus, last unit looks very small. Needs some more**
- **In** Matrix of PhD, a 2 credit course on **Research and publication ethics** needs to be incorporated as per UGC notification. It's a compulsory paper for PhD course work.

Synopsis of all the 3 units are perfect.
with regards

Brijmohan Singh Bhau, PhD

Dean Research Studies
&
Head-Department of Botany,
Central University of Jammu (CUJ),
Rahya-Suchani (Bagla), District Samba,
Pincode - 181 143,
Jammu & Kashmir (J&K), India
Tel. No. +91-01923-249658 (O); +91-01923-2615310 (R); +91-9957574216 (M)
Fax. No. +91-01923-249658

Dr.Pankaj Mehta <drpankajmehta79@gmail.com>

To: sunil dhar
Cc: Deepak Pathania,akkoul2003@yahoo.com,anilkul54@gmail.com,richa kothari,Brijmohan Bharand 1 more...
Fri, Jul 10, 2020 at 1:13 PM

Sir,

The Course code for all the courses for M.Sc and PhD course work need to be mentioned in the course Matrix as pointed out by Prof. Dhar

The Syllabus of PhD course work is not enclosed in the mail which also need to be done like it is done for M.Sc

Kindly treat the draft/s of syllabus and Ph.D synopsis as approved from my side

Kind Regards
Dr. Pankaj Mehta

Show original message

--
Dr.Pankaj Mehta
Central University of Jammu
Department of Environmental Sciences
Bagla (Rahya-Suchani)
District Samba -181143
Jammu, J&K, India

Email: drpankajmehta79@gmail.com, pankajmehta@cujammu.ac.in
Mobile: 94192-94741, 7006536843

Dr.Pankaj Mehta <drpankajmehta79@gmail.com>
To:Deepak Pathania
Cc:akkoul2003@yahoo.com,Avinash Kumar,anilkul54@gmail.com,sunil dhar,richa kothariand 2 more...
Fri, Jul 10, 2020 at 1:13 PM

Sir ·

The Course code for all the courses for M.Sc and PhD course work need to be mentioned in the course Matrix as pointed out by Prof. Dhar

The Syllabus of PhD course work is not enclosed in the mail which also need to be done like it is done for M.Sc

Kindly treat the draft/s of syllabus and Ph.D synopsis as approved from my side

Kind Regards
Dr. Pankaj Mehta

Show original message

--
Dr.Pankaj Mehta
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Jammu, J&K, India

Email: drpankajmehta79@gmail.com, pankajmehta@cujammu.ac.in
Mobile: 94192-94741, 7006536843

Anil Kulkarni <anilkul54@gmail.com>
To:Deepak Pathania
Cc:akkoul2003@yahoo.com,Avinash Kumar,sunil dhar,Dr.Pankaj Mehta,richa kothariand 1 more...
Thu, Jul 9, 2020 at 1:08 PM

Dear Prof. Pathania,

Thanks for your mail. Thanks for forwarding the matrix of master-doctoral work and synopsis of some students. I agree with material sent to me and happy to approve syllabus, matrix and synopsis.

With kind regards

Anil

Anil Kulkarni
Distinguished scientist,
Indian Institute of Science, Bangalore.

Show original message

--
Anil Kulkarni
Distinguished Scientist
Divecha Centre for Climate Change
Indian Institute of Science
Bangalore 560012
http://www.dccc.iisc.ernet.in/faculty/avk/

Deepak Pathania <dpathania74@gmail.com>
To:Dr.Pankaj Mehta
Cc:sunil dhar,akkoul2003@yahoo.com,anilkul54@gmail.com,richa kothari,Brijmohan Bhauand 1 more...
Fri, Jul 10, 2020 at 4:06 PM

Dear All

Thanks for prompt reply and suggestions for improving the course content of M.Sc III and IV Semester and PhD (EVS). Your suggestions will be well taken and accordingly, necessary changes will be made.

Once again thanks for sparing time and seeking your cooperation in the future also.

Regards

Central University of Jammu

Department of Environmental Sciences

Semester-III

Course Code	Course Title Core Courses	Credit	CIA	MSE	ESE	Total Marks	Remarks
	Environmental Technology	4	25	25	50	100	
	Environmental Chemistry	4	25	25	50	100	
	Mitigation and Management of Natural and Man-made Disasters	4	25	25	50	100	
	Lab Course	2			50	50	Theory paper based labs
	Lab Course	2			50	50	Theory paper based labs
	Interdisciplinary Course						
	Introduction to Ecology and Environmental Sciences	4	25	25	50	100	Change in code
Foundation course							
	Remote Sensing and GIS	2	12.5	12.5	25	50	
TOTAL		22				550	

Semester-IV

Course Code	Course Title	Credit	CIA	MSE	ESE	Total Marks
	Core Courses					
	Environmental Laws, Policies, and Ethics	4	25	25	50	100
	Environmental Management System	4	25	25	50	100
	Environmental Impact Assessment	4	25	25	50	100
	Dissertation	08	-	50	150	200
Interdisciplinary Course						
PGEVS4I003T	Current Environmental Issues and Concerns	4	25	25	50	100
TOTAL		24				600

Note: SWAYAM-MOOC Course to be opted from the list of UGC-MOOC Course floated for the Session as per University norms.

Syllabus for the Masters Degree Programme in Environmental sciences
Semester – III
Applicable for the Academic year 2020-2021
Subject Course Code :
Subject Course Title: Disaster Management
Duration of Examination: 3 Hours **Maximum Marks: 100**
Credits: 4 **Contact Hours / Week: 4**

UNIT I: INTRODUCTION TO DISASTERS

1.1 Understanding a disaster; Hazard, vulnerability, Resilience and risks
1.2 Distinction between a disaster and a hazard;
1.3 Natural disasters: Meaning and nature of natural disasters, their types and effects.
1.4 Human -made disasters: Meaning and nature of Human-made disasters, their types and effects
1.5 Impacts of Disasters

UNIT II: NATURAL AND HUMAN-MADE DISASTERS

2.1 Geological and geomorphic disasters
2.2 Hydrological disasters
2.3 Climatic change: global warming, Ozone depletion, acid rain.
2.4 Nuclear, Chemical and Biological disasters(Epidemics and disease outbreaks)
2.5 Fires, air and water pollution; Deforestation and desertification

UNIT III: DISASTER MANAGEMENT CYCLE

3.1 Disaster management cycle: Introduction
3.2 Phase I : Mitigation
3.3 Phase II : Preparedness
3.4 Phase III : Response
3.5 Phase IV : Recovery

UNIT IV: HEALTH AND SOCIAL ISSUES ASSOCIATED WITH DISASTERS

4.1 Major health and social issues: communicable and vector related diseases, environmental health challenges, physical, socio-economic and emotional impacts, most vulnerable groups to disaters
4.2 Pre-disaster management plan, personnel training ,volunteer assistance, School based Programmes
4.3 Hazardous material, storing and handling, coping with exposure to hazardous materials
4.4 Education and public awareness about a) community based Initiatives b) Non Government Organizations (NGOs), regional and International organizations / donor agencies, methods of dissemination, c) Advantages and disadvantages of the community based approach.

UNIT V: Risk and Vulnerability Analysis in Disaster Management

5.1 Risk and Vulnerability Analysis a) Risk : Its concept and analysis b) Risk Reduction c) Vulnerability, Its concept and analysis d) Strategic Development for Vulnerability Reduction

5.2 Pre-Disaster mitigation plan, personnel training, volunteer assistance, school-based Programmes

5.3 Emergency Management Systems; GIS applications

5.4 Disaster Management Act and Policy

REFERENCE BOOKS:

1. Coppola P Damon, 2011, 2nd edition. Introduction to International Disaster Management, Butterworth-Heinemann Press.
2. Cuny, F. 2010.Development and Disasters, Oxford University Press.
3. Gupta Anil K, Sreeja S. Nair. 2011. Environmental Knowledge for Disaster Risk Management, NIDM, New Delhi.
4. Kapur Anu 2010: Vulnerable India: A Geophysical Study of Disasters, IIAS and Sage Publishers, New Delhi.
5. IFRC, 2005. World Disaster Report: Focus on Information in Disaster,pp.182-225

Central University of Jammu

Department of Environmental Sciences

Scheme for Ph.D. Programme:

SEMESTER-I (2020-21)

Course Code	Course Title	Credit	CIA	MSE	ESE	Total Marks
	CORE COURSES					
	Research and Publication Ethics*	2	--	--	50	50
	Advanced tools and techniques in Environmental Sciences	4	--	--	100	100
	Current Environmental Issues and Challenges	4	--	--	100	100
	Basic Statistics	2			50	50
	Seminar	0(NC)	--	--	S/US Grade	S/US Grade
	ELECTIVE COURSES (ANYONE)					
	Advanced Atmospheric Chemistry	4	--	--	100	100
	Advances in Microbiology & Bioprocesses	4	--	--	100	100
	Advances in Geochemistry	4	--	--	100	100
	Atmospheric Processes & Climate Change	4	--	--	100	100
	Bioenergy & Nanomaterials	4	--	--	100	100
Total		**16**				**400**

*As per UGC guidelines

Syllabus for the Master's Degree Programme in Environmental Sciences
Semester – III
Applicable for the Academic year 2020-2021
Course Code:
Course Title: Environmental Technology
Duration of Examination: 3 Hours **Maximum Marks: 100**
Credits: 4 **Contact Hours / Week: 4**

UNIT I: TYPES OF MICROBES AND THEIR IMPORTANCE

1.1 Environmental microbiology: definition, concept, scope and importance
1.2 Classification and structure of microorganisms (bacteria, virus and Fungi)
1.3 Microbes in agriculture: bio-fertilizers
1.4 Food microbiology - micro-organisms of food, microbes in food production, food spoilage – fish and meat, food poisoning and its prevention

UNIT II: MICROBES AND ENVIRONMENT

2.1 Microbial Methods: types of culture, techniques used in enrichment of culture, method of pure culture, preparation, maintenance and preservation of microbial culture, sterilization and disinfection,
2.2 Microbes and environment: role of microorganisms in the natural system and artificial system; microbes and nutrient cycles
2.3 Microbial communication system; microbial fuel cells; prebiotics and probiotics; vaccines.
2.4 Microbiology of water, air and soil; environmental aspects of infectious diseases (water-borne diseases)

UNIT III: BASIC BIOTECHNOLOGY

3.1 Structures and function of DNA
3.2 Gene expression
3.3 Introduction to cloning and recombinant DNA technology/genetic engineering: restriction enzymes, cloning vectors, agarose and polyacrylamide gel electrophoresis, automated DNA sequencing, genome resources, PCR, environmental applications of genetic engineering.
3,4 Development of Genetically modified organisms GMOs (transgenic plants and animals); GMOs for human welfare; consequences of GMOs on the environment; issues related to Bt cotton and Bt brinjal

UNIT IV: ENVIRONMENTAL BIOTECHNOLOGY

4.1 Environmental Biotechnology in Pollution Control, Bioremediation: role of microbe, plants and GEMs.
4.2 Integrated system for biodegradation of PCBs, halogenated hydrocarbons, PAHs, pesticides and detergents; biodegradable plastics production from microorganisms.

4.3 Role of biotechnology in the reclamation of wasteland; bioprospecting; biopiracy, Biocomposting: Microbial process involvement; biopesticides production; biomining; biomethanation.

4.4 Development of gene probes for environmental remediation; biosensors.

UNIT V: NANOTECHNOLOGY AND GREEN TECHNOLOGY

5.1 Nanotechnology: Introduction, scope and applications.

5.2 Nanostructures and properties; metal nanoparticles; applications of nanoproducts.

5.3 Green technology: Introduction and tools, basic principles of Green technology; production of green technology-based products; the concept of Atom economy; Zero waste technology.

5.4 Biopolymers and bioplastics.

Suggested Readings:

1. Scragg, A.H., Environmental Biotechnology. Oxford University Press.
2. Rittmann, B. E. and McCarty, P.L., Environmental Biotechnology: Principles and applications. McGraw Hill.
3. Evans, G.M. and J.C. Furlong. Environmental Biotechnology: Theory and application. John Wiley and Sons Publication.
4. Microbiology 6th ed: Purohit, Agrobios
5. Global Environmental Biotechnology: D. L. Wise
6. Methods in Biotechnology: Hans Peter Schmauder

Syllabus for the Master's Degree Programme in Environmental Sciences
Semester – III
Applicable for the Academic year 2020-21
Subject Course Code No:
Subject Course Title: Environmental Chemistry
Duration of Examination: 3 Hours **Maximum Marks: 100**
Credits: 4 **Contact Hours / Week: 4**

UNIT-I: FUNDAMENTALS OF ENVIRONMENTAL CHEMISTRY

1.1 Mole Concept, Solution Chemistry, solubility product, Solubility of gases, Phase change

1.2 Laws of thermodynamic- first, second and third, Stereochemistry

1.3 Gibbs enthalpy, Chemical Potential, Chemical Equilibrium, Acid-base reactions

1.4 Sources of natural and artificial radiations, Applications and handling of isotopes and other radionuclides in the environment

UNIT-II: ATMOSPHERE CHEMISTRY

3.1 Major and trace gases in the atmosphere

3.2 Physical and chemical attributes of aerosols; sources, fate and sink of ambient aerosols

3.3 Thermo-chemical and photochemical reactions in the atmosphere

3.4 Tropospheric oxidation-reduction processes, smog formation; stratospheric and surface ozone, acid rain

3.5 Role of hydrocarbons, oxides of sulphur and nitrogen, halogens in the atmosphere; chemical speciation, particles, ions, and radicals in the atmosphere

UNIT-III: CHEMISTRY OF WATER AND SOIL

4.1 Water chemistry: Structure and properties of water, Water quality parameters, Physicochemical concepts of color, odor, turbidity, pH, conductivity, DO, COD, BOD, alkalinity, carbonate system in water, redox reactions, eutrophication

4.2 Soil Chemistry: Physio-chemical composition of the soil, humus, Inorganic and organic components of soil, nutrients (NPK) in soil, the significance of C: N ratio, Cation exchange capacity (CEC), Reactions in soil solution

UNIT-IV: CHEMISTRY OF ORGANIC AND INORGANIC POLLUTANTS

4.1 Hydrocarbons: Chemistry of hydrocarbon decay, environmental effects, effects on macro and microorganisms

4.2. Surfactants: Cationic, anionic and non-ionic detergents, modified detergents.

4.3 Pesticides: Classification, degradation, analysis, pollution due to pesticides – DDT and Endosulfan

4.4. Heavy metals: Toxic effects of Cd, Pb & Hg.

UNIT-V: GREEN CHEMISTRY AND GREEN TECHNOLOGY

5.1 New trends in green chemistry, Basic principles, Atom economy concept and its environmental importance

5.2 Green reagents, Green solvents, Green technology, minimization of energy consumption

5.3 Microwave heating & pollution, Ultrasound technique, Industrial Ecology

REFERENCE BOOKS:

1. Mannahan, S.E. Environmental Chemistry. 9th Edition, CRC Press
2. Foth, H.D. Fundamentals of Soil Science. Wiley press
3. Gole, G.A. Text book of Limnology. Waveland Pr. Inc. Press
4. Sharma, B.K. and Kaur, H. Environmental Chemistry-Sharma & Kaur, Goel Publishing House
5. De, A. K. Environmental Chemistry, New Age International
6. Lancaster M.(2002). Green Chemistry: An Introductory Text, RSC Publishing, UK.
7. Clark J. H. and Macquarrie, D. J. (2002). Handbook of Green Chemistry and Technology, Wiley-Blackwell, UK.

Syllabus for the Masters Degree Programme in Environmental sciences
Semester – III
Applicable for the Academic year 2020-2021
Subject Course Code :
Subject Course Title: Disaster Management
Duration of Examination: 3 Hours **Maximum Marks: 100**
Credits: 4 **Contact Hours / Week: 4**

UNIT I: INTRODUCTION TO DISASTERS

1.1 Understanding a disaster; Hazard, vulnerability, Resilience and risks
1.2 Distinction between a disaster and a hazard;
1.3 Natural disasters: Meaning and nature of natural disasters, their types and effects.
1.4 Human -made disasters: Meaning and nature of Human-made disasters, their types and effects
1.5 Impacts of Disasters

UNIT II: NATURAL AND HUMAN-MADE DISASTERS

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2.2 Hydrological disasters
2.3 Climatic change: global warming, Ozone depletion, acid rain.
2.4 Nuclear, Chemical and Biological disasters(Epidemics and disease outbreaks)
2.5 Fires, air and water pollution; Deforestation and desertification

UNIT III: DISASTER MANAGEMENT CYCLE

3.1 Disaster management cycle: Introduction
3.2 Phase I : Mitigation
3.3 Phase II : Preparedness
3.4 Phase III : Response
3.5 Phase IV : Recovery

UNIT IV: HEALTH AND SOCIAL ISSUES ASSOCIATED WITH DISASTERS

4.1 Major health and social issues: communicable and vector related diseases, environmental health challenges, physical, socio-economic and emotional impacts, most vulnerable groups to disaters
4.2 Pre-disaster management plan, personnel training ,volunteer assistance, School based Programmes
4.3 Hazardous material, storing and handling, coping with exposure to hazardous materials
4.4 Education and public awareness about a) community based Initiatives b) Non Government Organizations (NGOs), regional and International organizations / donor agencies, methods of dissemination, c) Advantages and disadvantages of the community based approach

4.5 Emergency Management Systems; GIS applications

UNIT V: DISASTER MANAGEMENT

5.1 Pre-Disaster mitigation plan, personnel training, volunteer assistance, school-based Programmes
5.2 Education and public awareness about disasters
5.3 Community based Initiatives, NonGovernment Organizations (NGOs), regional (Panchayati Raj Institutions (PRIs)/ Urban Local Bodies (ULBs)) and International organizations.
5.4 Emergency Management Systems; GIS applications
5.5 Disaster Management Act and Policy

REFERENCE BOOKS:

1. Coppola P Damon, 2011, 2nd edition. Introduction to International Disaster Management, Butterworth-Heinemann Press.
2. Cuny, F. 2010.Development and Disasters, Oxford University Press.
3. Gupta Anil K, Sreeja S. Nair. 2011. Environmental Knowledge for Disaster Risk Management, NIDM, New Delhi.
4. Kapur Anu 2010: Vulnerable India: A Geophysical Study of Disasters, IIAS and Sage Publishers, New Delhi.
5. IFRC, 2005. World Disaster Report: Focus on Information in Disaster,pp.182-225

Interdisciplinary Elective Course

Syllabus for the Masters Degree Programme in Environmental Sciences
Semester – III
Applicable for the Academic year 2020-2021
Course code: PGEVS3I006T
Course Title: Introduction to Ecology and Environmental Sciences
Duration of Examination: 3 Hours **Maximum Marks: 100**
Course Credits: 4 **Contact Hours / Week: 4**

UNIT I: INTRODUCTION

1.1 Introduction to Ecology and environmental sciences
1.2 Branches of ecology
1.3Ecological factors:(a)Abiotic (b) Biotic (c) Edaphic
1.4 Law of Minimum and law of Tolerance

UNIT II: COMPONENTS OF ENVIRONMENT

2.1 Atmosphere
2.2 Hydrosphere
2.3 Lithosphere
2.4 Biosphere and its components

UNIT III: INTRODUCTION TO ECOSYSTEM

3.1 Concept of Ecosystem
3.2 Energy flow in Ecosystem
3.3 Primary and secondary Productivity
3.4 Concept of Food chain, Food Web and Ecological Pyramids

UNIT IV: NATURAL RESOURCES AND THEIR CONSERVATION

4.1 Concept of Reserve and Resource
4.2 Classification of Natural Resources
4.3 Renewable and Non-renewable Resources: water, land, minerals, etc.
4.4 Resource management and Conservation

UNIT V: ENVIRONMENTAL ISSUES

5.1 Global Warming and Climate change
5.2 Ozone Layer depletion and UV-Exposure
5.3 Deforestation
5.4 Acid Rain, Smog

Suggested Readings:

1. Kormandy, E.J. Concepts of Ecology. 4th Edition. PHI Learning, New Delhi.2012
2. Odum, E.P. and Barrett, G.W. Fundamentals of Ecology. 4th Edition.Cengage Learning India Private Limited.2012
3. Subramanyam, N.S and Sabamurty, A.V.S 2nd Edition. Narosa Publishing House 2011.
4. Dash, M.C. Fundamentals of Ecology. 3rd Edition. Tata McGrawHill 2011.
5. Vishwanathan Prasad. An introduction to Environment.Rawat Publications. 2012.
6. Vasudevan, Essentials of Environmental Science. Atlantic Publishers. 2011.
7. Tiwari, S.K. Environmental Science. Atlantic Publishers. 2011.
8. Karki, M.M.S. Concise Encyclopaedia of Environment. Atlantic Publishers and Distributors.

Foundation Compulsory /Ability enrichment course

Syllabus for the Masters Degree Programme in Environmental sciences

Semester – III

Applicable for the Academic year 2020-2021

Course Code:

Course Title: Remote Sensing and GIS (Foundation Compulsory /Ability enrichment course)

Credits: 2 **Maximum Marks: 50**

Duration of Examination: 2 Hours **Contact Hours / Week: 2**

UNIT I: REMOTE SENSING AND IMAGE INTERPRETATION

1.1 Remote Sensing – fundamentals, Platforms in remote sensing, Satellites and their characteristics

1.2 Basic principles, types, steps and elements of image interpretation.

1.3 Concept of digital image processing. Image enhancement techniques, Concept of Spatial Filtering and edge Enhancement

1.4 Concept of Supervised and unsupervised classification and classification accuracy assessment

UNIT II:FUNDAMENTALS OF GIS AND GPS

2.1 GIS concepts, Coordinate system and projections**,** GIS data modeling

2.2 Basic concepts of cartography, Data structures- vector and raster data

2.3 Data inputting, data storage, data editing, Hardware and Software requirement for GIS.

2.4 Basic principles of global positioning system (GPS). GPS measurements and accuracy of GPS

UNIT III:APPLICATION OF GIS AND REMOTE SENSING

3.1 Remote sensing based land use/land cover mapping.

3.2 Remote Sensing & GIS application in hazard zonation mapping.

3.3 Remote sensing of water resources, Drainage mapping, flood mapping.

3.4 Remote sensing application in forest cover mapping.

Suggested Readings:

1. Lillesand Kiefer Chipman: Remote sensing and Inmage interpretation, Willey
2. Stephen Wise: GIS Fundamentals (Second Edition), CRC Press
3. Robert A. Schowengerdt: Remote Sensing, Elsevier

Syllabus for the Masters Degree Programme in Environmental Sciences
Semester – IV

Syllabus for the Masters Degree Programme in Environmental Sciences
Semester – IV
Applicable for the Academic year 2020-2021
Subject Course Code No.
Subject Course Title: Environmental Laws, Policies and Ethics
Duration of Examination: 3 Hours **Maximum Marks: 100**
Credits: 4 **Contact Hours / Week: 4**

UNIT I: INTERNATIONAL EFFORTS FOR ENVIRONMENTAL PROTECTION

1.1 UN Conference on Human Environment, 1972
1.2 UN Conference on Environment and Development, 1992
1.3 UN Convention on Biological Diversity, 1992; UN Framework Convention on Climate Change, 1992
1.4 Kyoto Protocol, 1997 and Post Kyoto Developments; Sustainable Development : Salient features

UNIT II: ENVIRONMENTAL POLICIES AND ETHICS

2.1 National Environment Policy, 2006: Salient Features
2.2 National Action Plan on Climate Change, 2008
2.3 Environment Ethics with special reference to Ancient India
2.4 Environmental Movement in India

UNIT III: ENVIRONMENT PROTECTION AND LAW

3.1 Indian Constitution and Environment Protection
3.2 Judicial activism towards environment Protection
3.3 Environment Protection Act, 1986
3.4 Public Liability Insurance Act, 1991; National Green Tribunal Act, 2010

UNIT IV: POLLUTION ABATEMENT AND THE LAW

4.1 The Water (Prevention and Control of Pollution) Act, 1974; The Air (Prevention and Control of Pollution) Act, 1981
4.2 Hazardous Wastes(Management , Handling and Transboundary Movement) Rules, 2008 and amendments; Municipal Solid Wastes (Management and Handling) Rules, 2000, and its Amendments
4.3 Explosives Act, 1872, Explosive Substances Act, 1908, Mines and Minerals (Regulation and Development) Act, 1957,
4.4 Insecticides Act, 1968, Atomic Energy Act, 1962, Factories Act, 1948

UNIT V: NATURAL RESOURCES CONSERVATION AND LAW

5.1. Wildlife Protection Act, 1972: Relevant Features

5.2 Forest Conservation Act, 1986

5.3. Biological Diversity Act 2002 and its Amendments

REFERENCE BOOKS:

1. S. Diwan and A. Roscencranj, Environmental Law and Policy in India, Oxford Pub.
2. P. Leelakrishan, Environmental Law in India, ButterworthsKladhira (2008)
3. P.S. Jaswal, Environmental Law (Pioneer Publications)
4. S. Lal Commentaries on Water, Air and Environmental Pollution
5. D.S. Senegar, Environmental Law, Transnational Publishers.
6. SC Shastri, Environmental Law in India (Eastern Book Company)

As per old syllabus

Syllabus for the Masters Degree Programme in Environmental Sciences

Semester-IV

Applicable for the Academic year 2020-2021

Subject Course Code No.

Subject Course Title: Environmental Impact Assessment

Duration of Examination: 3 Hours **Maximum Marks: 100**

Credits: 4 **Contact Hours / Week: 4**

UNIT 1: EIA OVERVIEW

1.1 Historical account, Objectives of EIA, linkage between development and environment
1.2 Relationship of EIA to sustainable development
1.3 EIA in project planning and implementation
1.4 Environmental policy and regulatory guidelines regarding EIA in India1.5, EIA notification.

UNIT 2: EIA PROCESSES

2.1 Assessment of environmental impacts: the EIA approach
2.2 Environmental impact of developmental projects
2.3 EIA processes, Components and techniques
2.4 EIA of major projects case studies (Thermal power plant, River valley project)

UNIT-3: BIODIVERSITY IMPACT ASSESMENT AND RISK ANALYSIS

3.1 Role of BIA in the existing EIA process
3.2 Identification, prediction, and evaluation of impacts on biodiversity
3.3 Restoration and rehabilitation technologies
3.4 Environmental risk: analysis, assessment and management.

UNIT-4: SOCIAL & HEALTH IMPACT ASSESMENT

4.1 Impact of environment on health, Development framework and HIA analysis
4.2 Changing concept and approach in HIA
4.3 Overview and scope of Social Impact Assessment
4.4 Variables for SIA

UNIT-5: INTEGRATED IMPACT ASSESMENT (ENVIRONMENTAL, SOCIAL AND HEALTH)

5.1 Land use pattern and Land use policy of India, Urban and rural planning,
5.2 Concept of economic analysis, Scope for integrated approach in economic analysis
5.3 Cost benefit analysis and cost effectiveness analysis
5.4 Role and relevance of GIS techniques in EIA

REFERENCE BOOKS:

1. Canter, L. W. and Graw, Mc, Environmental Impact Assessment, Hill Publication, New York.

2. Vanclay F. and Bronstein, D.A. (1995), Environmental and social impact assessment, John Wiley & Sons, New York.

3. Bathwal, R.R (1988) Environmental Impact Assessment, New age Publication

4. Clark, B. D., Bissel, B. D. and Watheam, P. EIA – A Biography.

5. D. P. Lawrence (2003) Environmental Impact Assessment: Practical Solutions to RecurrentProblems, John Wiley and Sons, New Delhi.

As per old syllabus

Syllabus for the Masters Degree Programme in Environmental Sciences

Semester – IV

Applicable for the Academic year 2020-2021

Subject Course Code No:

Subject Course Title: Environmental Management System

Duration of Examination: 3 Hours **Maximum Marks: 100**

Credits: 4 **Contact Hours / Week: 4**

UNIT 1: OVERVIEW OF EMS

1.1 Environmental management system structure

1.2 Context of environmental management, overview of the state of the global environment

1.3 Introduction to EMS evaluation tool

1.4 Element and extent of application

UNIT 2: ISO-14000

2.1 Background

2.2 ISO-14000 series

2.3 Business and standards, ISO-14000 and world practices

2.4 ISO in developing World

UNIT-3: AUDITING

3.1 Scope and objectives

3.2 Standard for auditing, registration and implementing the audit

3.3 Procedures and benefits

3.4 Environmental auditing as a management tool and A Case study

UNIT 4: LIFE CYCLE ASSESSMENT (LCA)

4.1 Components of LCA

4.2 Measuring environmental impact (Life cycle stages of product, boundaries, functional unit, benefits of LCA)

4.3 Strategic framework for LCA

4.4 LCA- a tool for sustainability and A Case study

UNIT 5: RECENT CONCEPTS OF CORPORATE EMS

5.1 ISO-14062 – corporate EM

5.2 Principles of clean production, packaging, sustainable procurement

5.3 Social responsibility and function of corporate houses

5.4 Eco-labeling, ecological and carbon footprints (ISO 14064-65) and A Case study

REFERENCE BOOKS:

1. Christopher S. and Mark Y. (2007) Environmental Management Systems, (third edition), Earthscan Publications
2. David L.G. and Stanley B.D. (2001) ISO 14000 Environmental Management, Prentice Hall.
3. Madu C.N. (2007) Environmental Planning and Management, Imperial College Press.
4. Kenneth M.M. (1999). Basic concepts in Environmental Management System, Boca Raton FL, Lewis

Interdisciplinary Elective Course

Syllabus for the Masters Degree Programme in Environmental Sciences
Semester – IV
Applicable for the Academic year 2020-2021
Subject Course Code No.
Subject Course Title: Current Environmental Issues and Concerns
Duration of Examination: 3 Hours **Maximum Marks: 100**
Credits: 4 **Contact Hours / Week: 4**

UNITI: I: ENVIRONMENTAL AWARENESS

1.1 Environmental education: formal and in-formal methods; role of media in environmental awareness, role of NGOs, public participation in environmental movements
1.2 Current environmental issues, Stockholm Declaration, Earth summit, Vienna convention
1.3Montreal Protocol, Kyoto Protocol, Agenda 21, Environmental ethics
1.4 Sustainable development-principles and practices in relation to economics and ecology

UNIT-II GLOBAL ENVIRONMENTAL ISSUES

2.1 Biodiversity loss, Climate change
2.2 Ozone layer depletion, Sea level rise
2.3 Acid Rain, Forest fires,
2.4 Carbon sequestration and carbon credits

UNIT-III: ENVIRONMENTAL DISASTERS

3.1 Flood, Landslides, Tsunamis, Earthquake, Volcanoes
3.2 Minamata Disaster, Love Canal Disaster
3.3 Bhopal Gas Disaster; Chernobyl Disaster; Fukushima Daiichi nuclear disaster
3.4 COVID-19 pandemic : impacts and effects on environment and society

UNIT-IV: WASTE MANAGEMENT

4.1 Waste Management – Swachha Bharat Abhiyan
4.2 Solid waste and its management
4.3 Hazardous waste and its management
4.4 E-waste and its management; Plastic waste and its management

UNIT-V: CURRENT ENVIRONMENTAL ISSUES IN INDIA

5.1 Environmental issues related to water resource projects - Narmada dam, Tehri dam, Almatti dam, Cauvery and Mahanadi, Hydro-power projects in Jammu & Kashmir, Himachal and North-Eastern States.
5.2 Water conservation-development of watersheds, Rain water harvesting and ground water recharge
5.3 National river conservation plan – Namami Gange and Yamuna Action Plan.
5.4 Eutrophication and restoration of lakes. Conservation of wetlands, Ramsar sites in India

REFERENCE BOOKS:

1. Steie, G. Economics and Environment
2. Srivastav, Sweta. Basics of Environmental Science**,** Anmol Publications Pvt Ltd.
3. Bhatt, S. Environment protection and sustainable development, APH Publishing Corporation
4. Vishwanathan Prasad. An introduction to Environment.Rawat Publications. 2012.
5. Vasudevan, Essentials of Environmental Science. Atlantic Publishers. 2011.
6. Tiwari, S.K. Environmental Science. Atlantic Publishers. 2011.