

## **Environmental sustainability topics that are covered in the UG Chemistry Syllabus:**

Hons. Course:

1. Paper Code: BCEMDSHC-5.
2. Paper Title: Green Chemistry.

**Title: Green Chemistry**

### **Syllabus:**

#### *Theory*

#### **Introduction to Green Chemistry (5L)**

What is Green Chemistry? Need for Green Chemistry. Goals of Green Chemistry. Limitations/ Obstacles in the pursuit of the goals of Green Chemistry

#### **Principles of Green Chemistry and Designing a Chemical synthesis (25L)**

Twelve principles of Green Chemistry with their explanations and examples and special emphasis on the following:

1. Designing a Green Synthesis using these principles; Prevention of Waste/byproducts; maximum incorporation of the materials used in the process into the final products, Atom Economy, calculation of atom economy of the rearrangement, addition, substitution and elimination reactions.
2. Prevention/ minimization of hazardous/ toxic products reducing toxicity.  
  
risk = (function) hazard  $\times$  exposure; waste or pollution prevention hierarchy.
3. Green solvents– supercritical fluids, water as a solvent for organic reactions, ionic liquids, fluorous biphasic solvent, PEG, solventless processes, immobilized solvents and how to compare greenness of solvents.
4. Energy requirements for reactions – alternative sources of energy: use of microwaves and ultrasonic energy.
5. Selection of starting materials; avoidance of unnecessary derivatization – careful use of blocking/protecting groups.
6. Use of catalytic reagents (wherever possible) in preference to stoichiometric reagents; catalysis and green chemistry, comparison of

heterogeneous and homogeneous catalysis, biocatalysis, asymmetric catalysis and photocatalysis.

7. Prevention of chemical accidents designing greener processes, inherent safer design, principle of ISD “What you don’t have cannot harm you”, greener alternative to Bhopal Gas Tragedy (safer route to carcarbaryl) and Flixiborough accident (safer route to cyclohexanol) subdivision of ISD, minimization, simplification, substitution, moderation and limitation.

8. Strengthening/ development of analytical techniques to prevent and minimize the generation of hazardous substances in chemical processes.

### **Examples of Green Synthesis/ Reactions and some real world cases (22L)**

1. Green Synthesis of the following compounds: adipic acid, catechol, disodium iminodiacetate (alternative to Strecker synthesis)

2. Microwave assisted reactions in water: Hofmann Elimination, methyl benzoate to benzoic acid, oxidation of toluene and alcohols; microwave assisted reactions in organic solvents Diels-Alder reaction and Decarboxylation reaction

3. Ultrasound assisted reactions: sonochemical Simmons-Smith Reaction (Ultrasonic alternative to Iodine)

4. Surfactants for carbon dioxide – replacing smog producing and ozone depleting solvents with CO<sub>2</sub> for precision cleaning and dry cleaning of garments.

5. Designing of Environmentally safe marine antifoulant.

6. Rightfit pigment: synthetic azopigments to replace toxic organic and inorganic pigments.

7. An efficient, green synthesis of a compostable and widely applicable plastic (poly lactic acid) made from corn.

8. Healthier Fats and oil by Green Chemistry: Enzymatic Inter esterification for production of no Trans-Fats and Oils

9. Development of Fully Recyclable Carpet: Cradle to Cradle Carpeting

### **Future Trends in Green Chemistry (8L)**

Oxidation reagents and catalysts; Biomimetic, multifunctional reagents; Combinatorial green chemistry; Proliferation of solventless reactions; co crystal controlled solid state synthesis (C2S3); Green chemistry in sustainable development.

### ***Practical***

#### **Safer starting materials**

1. Preparation and characterization of nanoparticles of gold using tea leaves.

#### **Using renewable resources**

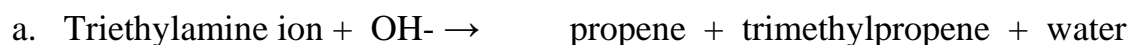
1. Preparation of biodiesel from vegetable/ waste cooking oil.

#### **Avoiding waste**

Principle of atom economy.

1. Use of molecular model kit to stimulate the reaction to investigate how the atom economy can illustrate Green Chemistry.

2. Preparation of propene by two methods can be studied



H<sub>2</sub>SO<sub>4</sub>/heat



3. Other types of reactions, like addition, elimination, substitution and rearrangement should also be studied for the calculation of atom economy.

#### **Use of enzymes as catalysts**

Benzoin condensation using Thiamine Hydrochloride as a catalyst instead of cyanide.

#### **Alternative Green solvents**

Extraction of D-limonene from orange peel using liquid CO<sub>2</sub> prepared from dry ice.  
Mechanochemical solvent free synthesis of azomethines

## **Alternative sources of energy**

1. Solvent free, microwave assisted one pot synthesis of phthalocyanine complex of copper (II).
2. Photoreduction of benzophenone to benzopinacol in the presence of sunlight.

## **Reading References:**

### ***Theory***

- ▶ Anastas, P.T. & Warner, J.K.: Green Chemistry - Theory and Practical, Oxford University Press (1998).
- ▶ Matlack, A.S. Introduction to Green Chemistry, Marcel Dekker (2001).
- ▶ Cann, M.C. & Connely, M.E. Real-World cases in Green Chemistry, American Chemical Society, Washington (2000).
- ▶ Ryan, M.A. & Tinnesand, M. Introduction to Green Chemistry, American Chemical Society, Washington (2002).
- ▶ Lancaster, M. Green Chemistry: An Introductory Text RSC Publishing, 2nd Edition, 2010.

### ***Practical***

- ▶ Anastas, P.T & Warner, J.C. Green Chemistry: Theory and Practice, Oxford University Press (1998).
- ▶ Kirchoff, M. & Ryan, M.A. Greener approaches to undergraduate chemistry experiment. American Chemical Society, Washington DC (2002).
- ▶ Ryan, M.A. Introduction to Green Chemistry, Tinnesand; (Ed), American Chemical Society, Washington DC (2002).
- ▶ Sharma, R.K.; Sidhwani, I.T. & Chaudhari, M.K. I.K. Green Chemistry Experiment: A monograph International Publishing House Pvt Ltd. New Delhi. Bangalore CISBN 978-93-81141-55-7 (2013).
- ▶ Cann, M.C. & Connelly, M. E. Real world cases in Green Chemistry, American Chemical Society (2008).

- ▶ Cann, M. C. & Thomas, P. Real world cases in Green Chemistry, American Chemical Society (2008).
- ▶ Lancaster, M. Green Chemistry: An Introductory Text RSC Publishing, 2nd Edition, 2010.
- ▶ Pavia, D.L., Lampman, G.M., Kriz, G.S. & Engel, R.G. Introduction to Organic Laboratory Techniques: A Microscale and Macro Scale Approach, W.B.Saunders, 1995.

3. [Link to Syllabus: Green Chemistry Syllabus link.](#)

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**Program Course:**

1. Paper Code: BCEMDSRC-3.
2. Paper Title: Green Chemistry.

**Title: Green Chemistry**

**Syllabus:**

*Theory*

**Introduction to Green Chemistry (5L)**

1. is Green Chemistry? Need for Green Chemistry. Goals of Green Chemistry. Limitations/ Obstacles in the pursuit of the goals of Green Chemistry

**Principles of Green Chemistry and Designing a Chemical synthesis (25L)**

Twelve principles of Green Chemistry with their explanations and examples and special emphasis on the following:

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2. Prevention/ minimization of hazardous/ toxic products reducing toxicity.

risk = (function) hazard  $\times$  exposure; waste or pollution prevention hierarchy.

1. Green solvents– supercritical fluids, water as a solvent for organic reactions, ionic liquids, fluorous biphasic solvent, PEG, solventless processes, immobilized solvents and how to compare greenness of solvents.

2. Energy requirements for reactions – alternative sources of energy: use of microwaves and ultrasonic energy.
3. Selection of starting materials; avoidance of unnecessary derivatization – careful use of blocking/protecting groups.
4. Use of catalytic reagents (wherever possible) in preference to stoichiometric reagents; catalysis and green chemistry, comparison of heterogeneous and homogeneous catalysis, biocatalysis, asymmetric catalysis and photocatalysis.
5. Prevention of chemical accidents designing greener processes, inherent safer design, principle of ISD “What you don’t have cannot harm you”, greener alternative to Bhopal Gas Tragedy (safer route to carbaryl) and Flixborough accident (safer route to cyclohexanol) subdivision of ISD, minimization, simplification, substitution, moderation and limitation.
6. Strengthening/ development of analytical techniques to prevent and minimize the generation of hazardous substances in chemical processes.

### **Examples of Green Synthesis/ Reactions and some real world cases (22L)**

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1. Surfactants for carbon dioxide – replacing smog producing and ozone depleting solvents with CO<sub>2</sub> for precision cleaning and dry cleaning of garments.
2. Designing of Environmentally safe marine antifoulant.
3. Rightfit pigment: synthetic azopigments to replace toxic organic and inorganic pigments.
4. An efficient, green synthesis of a compostable and widely applicable plastic (poly lactic acid) made from corn.
5. Healthier Fats and oil by Green Chemistry: Enzymatic Inter esterification for production of no Trans-Fats and Oils
6. Development of Fully Recyclable Carpet: Cradle to Cradle Carpeting

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#### **Safer starting materials**

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#### **Using renewable resources**

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#### **Avoiding waste**

Principle of atom economy.

1. Use of molecular model kit to stimulate the reaction to investigate how the atom economy can illustrate Green Chemistry.
2. Preparation of propene by two methods can be studied

a. Triethylamine ion + OH<sup>-</sup> → propene + trimethylpropene + water

H<sub>2</sub>SO<sub>4</sub>/heat

b. I-propanol → Propene + water

1. Other types of reactions, like addition, elimination, substitution and rearrangement should also be studied for the calculation of atom economy.

#### **Use of enzymes as catalysts**

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#### **Alternative Green solvents**

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#### **Alternative sources of energy**

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## **Reading References:**

### ***Theory***

- ▶ Anastas, P.T. & Warner, J.K.: Green Chemistry - Theory and Practical, Oxford University Press (1998).
- ▶ Matlack, A.S. Introduction to Green Chemistry, Marcel Dekker (2001).
- ▶ Cann, M.C. & Connely, M.E. Real-World cases in Green Chemistry, American Chemical Society, Washington (2000).
- ▶ Ryan, M.A. & Tinnesand, M. Introduction to Green Chemistry, American Chemical Society, Washington (2002).
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### ***Practical***

- ▶ Anastas, P.T & Warner, J.C. Green Chemistry: Theory and Practice, Oxford University Press (1998).
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- ▶ Ryan, M.A. Introduction to Green Chemistry, Tinnesand; (Ed), American Chemical Society, Washington DC (2002).
- ▶ Sharma, R.K.; Sidhwani, I.T. & Chaudhari, M.K. I.K. Green Chemistry Experiment: A monograph International Publishing House Pvt Ltd. New Delhi. Bangalore CISBN 978-93-81141-55-7 (2013).
- ▶ Cann, M.C. & Connelly, M. E. Real world cases in Green Chemistry, American Chemical Society (2008).
- ▶ Cann, M. C. & Thomas, P. Real world cases in Green Chemistry, American Chemical Society (2008).



► Lancaster, M. Green Chemistry: An Introductory Text RSC Publishing, 2nd Edition, 2010.

► Pavia, D.L., Lampman, G.M., Kriz, G.S. & Engel, R.G. Introduction to Organic Laboratory Techniques: A Microscale and Macro Scale Approach, W.B.Saunders, 1995.

3. Link to Syllabus: [Green Chemistry syllabus for Program Course.](#)

**Department of Geography**

**Courses in which the syllabus includes Environment sustainability:**

**Course Code: BGEOCCHT501**

**Course Title: CC 11 – Environmental Geography**

***Unit 1: Environmental Issues in Geography***

1. Geographers' approach to environmental studies
2. Perception of environment in different stages of civilization
3. Concept of holistic environment and system approach
4. Ecosystem: Concept, structure and functions
5. Environmental pollution and degradation: Land, water and air
6. Space–time hierarchy of environmental problems: Local, regional and global
7. Urban environmental issues with special reference to waste management
8. Environmental programmes and policies – Global, national and local levels

**Department –Sanskrit**

**Topic-Environment sustainability**

**UG VIth Semester**

**Sidho-Kanho-Birsha University**

**Course Code-BSNSDSHT5**

**Title:**

Environmental Awareness in Sanskrit literature आयुर्वेदस्य सामान्यपरिचयः

**Syllabus:**

**Section ‘A’ Environmental Issues and Importance of Sanskrit Literature :**

Science of Environment : Definition, Scope and Modern Crises : Role of Environment in human civilization; Meaning and definitions of The Environment; Various name for Science of Environment: ‘Ecology’, ‘Paryavarana’, Prakriti Vijnana’; Main components of Environment: living organisms( Jaiva Jagat) and non-living materials (Bhoutika Padarth). Elementary factor of Environment Physical elements, Biological elements and Cultural elements. Modern Challenges and Crises of Environment : Global warming, Climate change, Ozone depletion, Explosively increase in Pollution, Decrease in underground water label, River pollution, Deforestation in large scale. Natural calamities such as flood , draft and earthquakes Environmental Background of Sanskrit Literature : Importance of Sanskrit Literature from the view point of Science of environment ; Concept of ‘ Mother Earth’ and worship of Rivers in Vedic literature; Brief survey of 06 environmental issues such as protection and preservation of mother nature, planting trees in forests, and water preservation techniques as propounded in the Sanskrit Literature. Buddhist and Jain concepts of ecology, protection of trees, love for animals and birds;

**Section ‘B’ Environment Awareness in Vedic Literature :**

Environmental Issues and Eco-system in Vedic Literature Divinity to Nature, Co-ordination between all natural powers of universe; Cosmic order ‘Rta’ as the guiding force for environment of whole universe (Rgveda, 10.85.1 ); Equivalent words for Environment in Atharvaveda : ‘Vritavrita’ (12.1.52 ), ‘Abhivarah,’(1.32.4.), ‘Avritah’ (10.1.30), ‘Parivrita’ (10.8.31); five basic elements of universe covered by

environment : Earth, Water, Light, Air, and Ether. (Aitareya Upanishad 3.3) ; Three constituent elements of environment known as ‘Chandansi’: Jala (water), Vayu (air), and Osadhi (plants) (Atharvaveda, 18.1.17); Natural sources of water in five forms: rain water(Divyah), natural spring(Sravanti), wells and canals (Khanitrimah), lakes (Svayamjah) and rivers(Samudrarthah) Rigveda, 7.49.2). Environment Preservation in Vedic Literature: Five elementary sources of environment preservation: Parvat(mountain), Soma (water), Vayu (air), Parjanya (rain) and Agni (fire) (Atharvaveda, 3.21.10); Environment Protection from Sun (Rgveda,1.191.1-16, Atharvaveda,2.32.1-6, Yajurveda,4.4,10.6); Congenial atmosphere for the life created by the Union of herbs and plants with sun rays (Atharvaveda,5.28.5); Vedic concept of Ozone-layer Mahat ulb’(Rgveda,10.51.1; Atharvaveda,4.2.8); Importance of plants and animals for preservation of global ecosystem; (Yajurveda ,13.37); Eco friendly environmental organism in Upanishads (Brhadaranyaka Upanishad,3.9.28, Taittiriya Upanishad,5.101, Iso-Upanishad,1.1).

### **Section ‘C’ Environment Awareness in Classical Sanskrit Literature :**

Environmental Awareness and Tree plantation : Planting of Trees in Puranas as a pious activity ( Matsya Purana ,59.159;153.512 ; Varaha Purana 172. 39), Various medicinal trees to be planted in forest by king (Sukraniti,4.58-62) Plantation of new trees and preservation of old trees as royal duty of king ( Arthasastra, 2.1..20); Punishments for destroying trees and plants (Arthasastra,3.19), Plantation of trees for recharging under ground water(Brhadatsamhita, 54.119). Environmental Awareness and Water management : Various types of water canals & ‘Kulya’ for irrigation : canal originated from river ‘Nadimat mukha kulya’, canal originated from nearby mountain ‘Parvataparsva vartini kulya’, canal originated from pond, ‘Hrdsartha kulya’, Preservation of water resources ‘Vapi –kupa –tadaka’ (Agnipuranas,209-2; V.Ramayana,2.80.10-11); Water Harvesting system in Arthasastra (2.1.20-21); Underground Water Hydrology in Brhadatsamhita (Dakargaiadhyaya,chapter54); 06 Credits Unit: III Universal Environmental Issues in Literature of Kalidasa : Eight elements of Environment and concept of ‘Astamurti’ Siva (Abhijnasakuntalam I.); Preservation of forest, water resources, natural resources; protection of animals, birds and plant in Kalidasa’s works, Environmental awareness in Abhijnasakuntalam Drama, Eco- system of Indian monsoon in Meghdoot, Seasonal weather conditions of Indian sub continent in Ritusamhara, Himalayan ecology in Kumarasambhava, Oceanography in Raghuvamsa (canto-13).

**Department –Sanskrit**

**Topic-Gender issues**

UG 3rd Semester

**Sidho-Kanho-Birsha University**

**Course Code-BSNSCCHT303**

**Title:**

Indian Social Institutions and Polity भारतीय सामाजिकप्रतिष्ठानं राजनीतिश्च

### Structure of Society and Value of Life

Varṇa-System and Caste System : Four-fold division of Varṇa System, (R̥gveda, 10.90.12), Mahābhārata, Śāntiparva, 72.3-8); Division of Varṇa according to Guṇa and Karma (Bhagvadgīta , 4.13, 18.41-44). Origin of Caste-System from Inter-caste Marriages (Mahābhārata, Anuśāsanaparva, 48.3-11); Emergence of non-Aryan tribes in Varṇa-System (Mahābhārata, Śāntiparva, 65.13-22). Social rules for up-gradation and down-gradation of Caste System (Āpastambadharmasūtra, 2.5.11.10-11, Baudhāyanadharmasūtra, 1.8.16.13-14, Manusmṛti, 10,64, Yājñavalkyasmṛti, 1.96)

**Position of Women in the Society : Brief survey of position of women in different stages of Society. Position of women in Mahābhārata (Anuśāsanaparva, 46.5-11, Sabhāparva, 69.4-13. Praise of women in The Bṛhatsaṃhitā of Varāhamihira**

(Strīprasamsā, chapter-74.1-10) Social Values of Life : Social Relevance of Indian life style with special reference to Sixteen Saṃskāras. Four aims of life ‘Puruṣārtha Catuṣṭaya’- 1. Dharma, 2. Artha, 3. Kāma, 4. Mokṣa. Four Āśramas- 1. Brahmacharya, 2. Gṛhastha, 3. Vānaprastha, 4. Saṃnyās

# **ZOOLOGY**

## ENVIRONMENT SUSTAINABILITY

First semester(Honours)

Paper title-Perspectives in Ecology

Paper Code-BZOOCHC102

Fifth semester(Honours)

Paper title - Wildlife Conservation and Management

Paper Code-BZOODSHC-3

Fifth semester (pass)

Paper title -Wildlife Conservation and Management

Paper Code-BZOODSRC-1

**NISTARINI COLLEGE**  
**DEPARTMENT OF ENGLISH**

**Course Code: BENGCCHT 501**

**Course Title: Women's Writing**

**Course offered in the Sem-V, English Hons.**

**Issue dealt with: Gender Equality/ Gender Issues**

<b>Unit No.</b>	<b>Writer/Author/ Poet</b>	<b>Name of the Text</b>
Unit: 1	Emily Dickinson	1. 'I cannot live with you' 2. 'Because I could not stop for death'
Unit: 1	Sylvia Plath	'Lady Lazarus'
Unit: 1	Eunice De Souza	1. 'Advice to Women', 2. 'Bequest'
Unit: 2	Harriet Beecher Stowe	<i>Uncle Tom's Cabin</i>
Unit: 3	Katherine Mansfield	'Honeymoon'
Unit: 3	Jhumpa Lahiri	'Interpreter of Maladies'
Unit: 3	Mahashweta Devi	'The Hunt'
Unit: 4	Virginia Woolf	1. 'Shakespeare's Sisters', 2. 'Profession for Woman'
Unit: 4	Rassundari Debi	Excerpts from <i>Amar Jiban</i>

# **Economics**

## **BA (Hons.)**

Core Course & Program Course: 5th & 6th semester  
BECODSHT1, 2, 4, BECODSHT1, 3, 4

### **1. BECODSHT-1 Syllabus:**

#### **Title: Issues in Indian Economy**

#### **Syllabus:**

WTO and India

Different rounds of trade negotiations Macroeconomic Policies and Their Impact  
Fiscal Policy; trade and investment policy; financial and monetary policies; inflation  
and measures to control inflation, labour laws and regulation, SEZ Policies and  
Performance in Agriculture

Growth; productivity; agrarian structure and technology; capital formation; trade;  
food security and food policy, pricing and procurement; globalization and Indian  
agriculture. Policies and Performance in Industry

Growth; productivity; diversification; small scale industries; public sector;  
competition policy; foreign investment, globalization and Indian industry. Trends and  
Performance in Services

Formal and Informal Sectors, banking and insurance; trade in services.

#### **Reading References:**

- Shankar Acharya, 2010, —Macroeconomic Performance and Policies 2000-8,||  
in Shankar Acharya and Rakesh Mohan, editors, India's Economy:  
Performances and Challenges: Development and Participation, Oxford  
University Press.
  - Rakesh Mohan, 2010, —India's Financial Sector and Monetary Policy  
Reforms in Shankar Acharya and Rakesh Mohan, editors, India's Economy:  
Performances and Challenges: Development and Participation, Oxford  
University Press.
  - PulapreBalakrishnan, Ramesh Golait and Pankaj Kumar, 2008,  
—Agricultural Growth in India Since 1991, RBI DEAP Study no. 27.



- ▶ B.N. Goldar and S.C. Aggarwal, 2005, —Trade Liberalisation and Price-Cost Margin in Indian Industries, *The Developing Economics*, September.
- ▶ P. Goldberg, A. Khandelwal, N. Pavcnik and P. Topalova, 2009, —Trade Liberalisation and New Imported Inputs, *American Economic Review, Papers and Proceedings*, May.
- ▶ Kunal Sen, 2010, —Trade, Foreign Direct Investment and Industrial Transformation in India, in Premachandra Athukorala, editor, *The Rise of Asia*, Routledge.
- ▶ A. Ahsan, C. Pages and T. Roy, 2008, —Legislation, Enforcement and Adjudication in Indian Labour Markets: Origins, Consequences and the Way Forward, in D. Mazumdar and S. Sarkar, editors, *Globalization, Labour Markets and Inequality in India*, Routledge
- ▶ Dipak Mazumdar and Sandeep Sarkar, 2009, —The Employment Problem in India and the Phenomenon of the Missing Middle, *Indian Journal of Labour Economics*.
- ▶ J. Dennis Rajakumar, 2011, —Size and Growth of Private Corporate Sector in Indian Manufacturing, *Economic and Political Weekly*, April.
- ▶ Ramesh Chand, 2010, —Understanding the Nature and Causes of Food Inflation, *Economic and Political Weekly*, February.
- ▶ Bishwanath Goldar, 2011, —Organised Manufacturing Employment: Continuing the Debate, *Economic and Political Weekly*, April.
- ▶ Kaushik Basu and A. Maertens, eds, 2013, *The New Oxford Companion to Economics in India*, Oxford University Press
- ▶ A. Raychaudhury and P De, *International Trade in Services in India: Implications for Growth and Inequality in a Globalizing World*, OUP, 2012
- ▶ India Development Reports, IGIDR

## 2. BECODSHT-2 Syllabus:

### **Title: Economics of Health & Education**

#### **Syllabus:**

Role of Health and Education in Human Development

Importance in poverty alleviation; health and education outcomes and their relationship with macroeconomic performance. Microeconomic Foundations of Health Economics

Demand for health; uncertainty and health insurance market; alternative insurance mechanisms; market failure and rationale for public intervention; equity and

inequality. Evaluation of Health Programs

Costing, cost effectiveness and cost-benefit analysis; burden of disease. Health Sector in India: An Overview

Health outcomes; health systems; health financing. Education: Investment in Human Capital

Rate of return to education: private and social; quality of education; signaling or human capital; theories of discrimination; gender and caste discrimination in India.

Education Sector in India: An Overview

Literacy rates, school participation, school quality measures.

### **Reading References:**

- William, Jack, Principles of Health Economics for Developing Countries, World Bank Institute Development Studies, 1999.
- World Development Report, Investing in Health, The World Bank, 1993.
- Ronald G., Ehrenberg and Robert S., Smith, Modern Labor Economics: Theory and Public Policy, Addison Wesley, 2005.

### **3. BECODSHT-4:**

**Title: Environmental Economics**

### **Syllabus:**

Introduction

What is environmental economics; review of microeconomics and welfare economics.

The Theory of Externalities

Pareto optimality and market failure in the presence of externalities; property rights and the Coase theorem. The Design and Implementation of Environmental Policy

Overview; Pigouvian taxes and effluent fees; tradable permits; choice between taxes and quotas under uncertainty; implementation of environmental policy. International

Environmental Problems

Trans-boundary environmental problems; economics of climate change; trade and environment. Measuring the Benefits of Environmental Improvements

Non-Market values and measurement methods; risk assessment and perception.

Sustainable Development

Concepts; measurement.

## Reading References:

Charles Kolstad, Intermediate Environmental Economics, Oxford University Press, 2nd edition, 2010.

► Robert N. Stavins (ed.), Economics of the Environment: Selected Readings, W.W. Norton, 5th edition, 2005.

► Roger Perman, Yue Ma, James McGilvray and Michael Common, Natural Resource and Environmental Economics, Pearson Education/Addison Wesley, 3rd edition, 2003.

► Maureen L. Cropper and Wallace E. Oates, 1992, —Environmental Economics: A Survey Journal of Economic Literature, Volume 30:675-740

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Program Course Syllabus:

### 1. BECODSRT-1:

**Title: Development Economics**

## Syllabus:

Meaning of Economic Development

Income Approach and Capability Approach, construction and interpretation of HDI; international variations in development measures; comparing development trajectories across nations and within them. Dependency school of development. Economic Growth

An overview and policy implications of one sector growth models- Harrod- Domar, and Solow; Sources of economic growth, international comparisons. Poverty and Inequality

Inequality axioms; a comparison of commonly used inequality measures; Gender Inequality, connections between inequality and development; poverty measurement, HPI; poverty traps and path dependence of growth processes. Political Institutions and the State

Definition of institutions, Evolution of Political and Economic Institutions; The determinants of democracy; alternative institutional trajectories and their relationship with economic performance; within-country differences in the functioning of state institutions; state ownership and regulation; government failures and corruption.

## Reading References:

- ▶ Debraj Ray, Development Economics, Oxford University Press, 2009.
- ▶ Partha Dasgupta, Economics, a Very Short Introduction, Oxford University Press, 2007.
- ▶ Abhijit Banerjee, Roland Benabou and Dilip Mookerjee, Understanding Poverty, Oxford University Press, 2006.
- ▶ Kaushik Basu, The Oxford Companion to Economics in India, OUP, 2007.
- ▶ Kaushik Basu, Analytical Development Economics, OUP
- ▶ Amartya Sen, Development as Freedom, OUP, 2000.
- ▶ Daron Acemoglu and James Robinson, Economic Origins of Dictatorship and Democracy, Cambridge University Press, 2006.
- ▶ Robert Putnam, Making Democracy Work: Civic Traditions in Modern Italy, Princeton University Press, 1994
- ▶ Meier and Rauch (ed)- Leading Issues in Development Economics, OUP
- ▶ Todaro and Smith: Economic Development, Pearson Education, 2009
- ▶ Hayami and Godo, Development Economics, OUP
- ▶ Bardhan and Udry, Development Microeconomics, OUP

## **2. BECODSRT-3:**

**Title: Environmental Economics**

### **Syllabus:**

1. Introduction: Definition and Concept of Environmental Economics, Environment, Welfare Economics, Allocation Problem, Environmental Degradation, Economic Development
2. Property: Environment as Public Good, Intellectual Property Rights (IPR), Common Property Resources (CPR), The Problem of Commons
3. Environmental Policy: Design and Implementation of Environmental Problems, Governmental Policy, IPCC, Pollution Control Board (PCB), Coase Theorem
4. Sustainable Development: Concept, Measurement, Market Failure, Economic Growth and Sustainable Development
5. Climate Change: Concept, Impact on Agriculture and Health, Kutznet Curve, Pareto Equilibrium

### **Reading References:**

1. G.M. Meier: Leading Issues in Economic Development, OUP
2. UNDP: Human Development Report
3. IPCC: Annual Reports
4. R.N. Bhattacharyya: Environmental Economics
5. Charles Kolstad: Intermediate Environmental Economics, OUP, 2010

#### **BECODSRT-4: Title:**

Issues Indian Economics

#### **Syllabus:**

1. Features of Indian Economy: Features and Characteristics, Transition from Planned to the Market Economy and NITI AYOJ
2. Employment: Nature and Trends of Employment, Problems and Policy Initiatives for Poverty, MGNREGS, Human Poverty Index (HPI), Inclusive Growth
3. Sectoral Development: Agricultural Performance, Industrial Revolution, Service Sector Renovation, Growth and Productivity, Food Security
4. Foreign Sector Development: Trends of Trades and Investment, WTO and India, International Relations (BRICS, SAARC, SAFTA)
5. Environment and India: Recent Changes in Economic Policies regarding Climate Change and Environmental Degradation
6. Globalization: Impact on Services, Formal and Informal Sectors, Policies and Performances in Agriculture and Industry

#### **Reading References:**

1. IGIDR: India Development Reports
2. IPCC: Annual Reports
3. Dutta and Sundaram: Indian Economy
4. Dipak Mazumder and Sandeep Sarkar: The Employment Problems in India, Journal of Labour Economics, 2009
5. A.N. Agarwal, Indian Economics
6. RBI: Reserve Bank of India Bulletin
7. Government of India: Economic Survey
8. NSS: National Sample Survey Data

## **Education**

**Paper Code: BEDCCHT-302.**

**Paper Title: Education for Quality Living**

Unit- I: Value Education a) Value and Value Education: Meaning, Definitions, Nature and Scope b) Fostering Values: Role of parents, Teachers and Society c) Approaches to inculcating values among children

Unit – II: Peace Education a) Peace Education: Meaning and nature b) Peace Education and Curriculum: Method of integration peace concept in education c) Role of Education: Disseminations of peace and resolution of conflict

Unit –III: Education for Sustainable Development a) Meaning, aims & objectives b) Role of Education in Sustainable Development c) Difficulties in maintaining sustainable development

# **Philosophy**

## **Honours Course**

**1. Paper Code: BPHISEHT-405.**

**Title: Practical Ethics.**

### **Syllabus:**

Environmental ethics, Feminism, Euthanasia.(8+8+8)

### **Reading References:**

#### **Books:**

Peter Singer: Environmental ethics

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