

# Bio Physics

## Course Outcomes

- Basic fundamentals of living organism and its interactions in domains of Physics in
- Biology
- Understanding of heat transfer in biomaterials and its mechanism
- Diversifying of thermal, statistical physics in biological domain.
- Understanding fluid mechanisms in living organism in the domain of Physics

## UNIT I

- Building Blocks & Structure of Living State: Atoms and ions, molecules essential for life, what is life.
- Living state interactions: Forces and molecular bonds, electric & thermal interactions, electric
- Dipoles, Casimir interactions, domains of physics in biology. (18 Lectures)

## UNIT II

- Heat Transfer in biomaterials: Heat Transfer Mechanism, The Heat equation, Joule heating of tissue.
- Living State Thermodynamics: Thermodynamic equilibrium, first law of thermodynamics and conservation of energy. Entropy and second law of thermodynamics, Physics of many particle systems, Two state systems, continuous energy distribution, Composite systems, Casimir contribution of free energy, Protein folding and unfolding. (19 Lectures)

## UNIT III

Open systems and chemical thermodynamics: Enthalpy, Gibbs free energy and chemical potential, activation energy and rate constants, enzymatic reactions, ATP hydrolysis & synthesis, Entropy of mixing, the grand canonical ensemble, Hemoglobin. Diffusion and transport Maxwell-Boltzmann statistics, Fick's law of diffusion, sedimentation of Cell Cultures, diffusion in a centrifuge, diffusion in an electric field, Lateral diffusion in membranes, Navier Stokes equation, low Reynold's Number Transport, Active and passive membrane transport. (19 Lectures)

## **UNIT IV**

Fluids: Laminar and turbulent fluid flow, Bernoulli's equation equation of continuity, venture effect, Fluid dynamics of circulatory systems, capillary action. Bioenergetics and Molecular motors: Kinesins, Dyneins, and microtubule dynamics, Brownian motion, ATP synthesis in Mitochondria, Photosynthesis in Chloroplasts, Light absorption in biomolecules, vibrational spectra of bio-biomolecules. (19 Lectures)

### **Reference Books:**

1. Introductory Biophysics, J. Clay comb, JQP Tran, Jones & Bartlett Publishers
2. Aspects of Biophysics, Hughe S W, John Willy and Sons.
3. Essentials of Biophysics by P Narayanan, New Age International Introduction to Spectroscopy

## **Environmental Chemistry**

### **Course Objectives:**

The objectives of a course in environmental chemistry typically aim to provide students with a deep understanding of the chemical processes occurring in the environment and their impacts on ecosystems, human health, and the planet as a whole with a comprehensive understanding of the components and processes of environmental systems, including the atmosphere, hydrosphere, lithosphere, and biosphere, and their interactions. Investigation of the chemical composition of environmental compartments, including the atmosphere (air pollutants), hydrosphere (water pollutants), and lithosphere (soil pollutants), and the sources, fate, and transport of pollutants in these compartments. To examine the chemical properties and toxicological effects of environmental pollutants on ecosystems and human health, including acute and chronic toxicity, bioaccumulation, biomagnification, and risk assessment.

### **Course outcomes:**

- Gain a comprehensive understanding of the chemical processes occurring in the environment, including the sources, fate, and transport of pollutants
- Develop analytical skills in environmental chemistry, and apply a range of analytical techniques for the detection, and characterization of environmental pollutants.
- Aware of global environmental issues and challenges such as climate change, pollution, biodiversity loss, and resource depletion.
- Apply the principles of environmental chemistry for mitigating environmental pollution, promoting environmental conservation, and contributing to the development of environmentally friendly technologies and policies.

## UNIT I

Environment Introduction, Composition of atmosphere, vertical temperature, heat budget of the earth atmospheric system, vertical stability atmosphere, Biogeochemical Cycles of C, N, P, S and O. Biodistribution of elements. Hydrosphere Chemical composition of water bodies- lakes, streams, rivers and wet lands etc. Hydrological cycle. Aquatic pollution-inorganic, organic, pesticide agricultural, industrial and sewage, detergents, oil spills and oil pollutants. Water quality parameters- dissolved oxygen, biochemical oxygen demand, solids, metals, content of chloride, sulphate, phosphate, nitrate and micro-organisms. Water quality standards, Analytical methods for measuring BOD, DO, COD, F, oils, metals (As, Cd, Cr, Hg, Pb, Se etc) residual chloride and chlorine demand. Purification and treatment of water.

## UNIT II

Soils composition, micro and macro nutrients, pollution-fertilizers, pesticides, plastics and metals, waste treatment Atmosphere Chemical composition of atmosphere-particles, ions and radicals and their formation. Chemical and photochemical reactions in atmosphere, smog formation, oxides of N, C, S, O and their effect, pollution by chemicals, petroleum, minerals, chlorofluorohydrocarbons. Greenhouse effect, acid rain, air pollution controls and their chemistry. Analytical methods for measuring air pollutants. Continuous monitoring instruments.

## UNIT III

Industrial Pollution Cement, Sugar, distillery, drug, paper and pulp, thermal power plants, nuclear power plants, metallurgy. Polymers, drugs etc. Radionuclide analysis. Disposal of wastes and their management.

## UNIT IV

Environmental Toxicology, Chemical solutions to environmental problems, biodegradability, principles of decomposition.

### Text Books

- ✓ *Environmental Chemistry, A. K. De, Wiley Eastern*
- ✓ *Environmental Chemistry, S.E. Manahan, Lewis Publishers*
- ✓ *Environmental Chemistry with Green Chemistry, A. K. Das, Books & Allied (P) Ltd., Kolkata, 1st Edn, 2010*

### **References Books**

- ✓ *Environmental Chemistry, S.E. Manahan, Lewis Publishers*
- ✓ *Environmental Chemistry with Green Chemistry, A. K. Das, Books & Allied (P) Ltd., Kolkata, 1st Edn, 2010*
- ✓ *Environmental Toxicology, Ed. J. Rose, Gordon and Breach Science Publication*
- ✓ *Erach Bharucha. Textbook of Environmental Studies, Universities Press, 2005*

## **Food and Nutrition**

### **Course Outcome:**

- The students will get basic knowledge on macro and micro nutrients and different types of food and their nutritional contribution.
- The students will gain practical knowledge on market survey and locally available food stuffs from each food group.

### **Learning Outcome:**

- The students will learn the basic concepts in food, nutrition, and health.
- The students will gain an insight into the classification, functions, dietary sources, and daily requirements of various nutrients.

**The students will understand about different food groups and their nutritional contribution**

### **Unit-I: Basic Concepts in Food and Nutrition**

- Introduction to Food and Nutrition Science- Definitions (food, food science, food additive, fermented food, food fortification, functional food, nutrition, health, nutrients, nutritional status, optimal nutrition, nutrition security).
- Classification and Functions of Food- Physiological, psychological, and socio-cultural.
- Food Groups- Basic five and seven food groups, their nutritional contribution.
- Methods of Cooking- Different methods of cooking and their advantages and disadvantages: Dry methods - Frying, Sautéing, Parching, Roasting, Grilling/Broiling, Toasting, And Baking. Moist methods - boiling, steaming, stewing, simmering, poaching, blanching, pressure cooking. Combination method- braising.

### **Unit-II: Macro Nutrients**

- Carbohydrates- Introduction, classification, functions, dietary sources, and daily requirement.
- Proteins- Introduction, classification, functions, dietary sources, and daily requirement.
- Lipids- Introduction, classification, functions, dietary sources, and daily requirement.

### **Unit-III: Micro Nutrients:**

- Fat Soluble Vitamins (A, D, E and K)- Introduction, functions, dietary sources, daily requirement, and deficiency diseases.
- Water Soluble Vitamins (Thiamin, Riboflavin, Niacin, Folate, Vitamin B12 and Vitamin C)- Introduction, functions, dietary sources, daily requirement, and deficiency diseases.
- Minerals (Calcium, Iron, Zinc, and Iodine)- Introduction, functions, dietary sources, daily requirement, and deficiency diseases.

**Text Books:**

- ✓ *Srilakshmi. B, Food Science, New Age International (P) Limited Publishers.*
- ✓ *Srilakshmi. B, Nutrition Science, New Age International Pvt. Ltd.*
- ✓ *N. Shakuntala Manay, M. Shadaksharaswamy, Foods Facts and Principles, New Age International (P) Limited Publishers.*
- ✓ *Swaminathan. M, Advanced Text-Book on Food and Nutrition, Volume 1 and 2, The Bangalore printing and publishing co. LTD.*

**Reference Books:**

- ✓ *Bamji MS, Krishnaswamy K. Brahman GNV. Textbook of Human Nutrition, Oxford and IBH publish Co Pvt. Ltd.*
- ✓ *Norman. N Potter, Joseph H. Hotchkiss, Food Science, 5th edition, CBS Publishers, and Distributors.*
- ✓ *Mudambi S.R and Rajagopal M.V, Fundamentals of foods and Nutrition, New Age International Pvt. Ltd.*
- ✓ *Gopalan, C. Rama Sastry, B.V., and Balasubramanian, S.C., Nutritive value of Indian Foods, National Institute of Nutrition, ICMR, Hyderabad.*

**E-RESOURCES:**

- <http://www.nutrition.gov>
- <http://www.usda.gov>
- <http://egyankosh.ac.in>
- <http://ecourses.icar.gov.in>

**MODEL QUESTIONS**

1. Name the fat-soluble vitamins. (**One word**)
2. Define Nutrition. (**Maximum 50 words**)
3. Discuss about the classification of carbohydrate. (**Maximum 250 words**)
4. Explain the classification and functions of food. (**Maximum 800 words**)

# **Fundamentals of Entrepreneurship and E-Commerce**

## **Course Objectives:**

The course aims to

- Understand the basic concepts and theories of entrepreneurship.
- Identify and evaluate business opportunities in the digital economy.
- Develop skills in creating effective business plans and strategies.
- Gain knowledge of e-commerce platforms and technologies.
- Learn digital marketing techniques for online businesses.
- Understand the legal and ethical considerations in e-commerce.
- Develop critical thinking and problem-solving skills relevant to entrepreneurship and e-commerce.

## **Course Outcomes**

**After completion of the course, learners will be able to:**

- Understand Entrepreneurship Concepts and Identify Business Opportunities.
- Navigate Legal and Ethical Considerations for E-Commerce Platforms.
- Implement Digital Marketing Strategies.
- Manage and Analyze E-Commerce Performance.
- Develop Growth Strategies.

## **Unit-1: Introduction to Entrepreneurship**

Definition of entrepreneurship, Characteristics of successful entrepreneurs, Importance of entrepreneurship in the economy, Types of entrepreneurship. Opportunity Recognition and Idea Generation; Identifying business opportunities, Idea generation techniques, Market research and analysis, Identifying target markets and customer segments.

## **Unit-2: Business Planning**

Components of a business plan, Writing an executive summary, Marketing plan development, Financial projections and budgeting. Legal and Ethical Considerations; Legal structures for businesses, Intellectual property rights, Ethical considerations in entrepreneurship, Corporate social responsibility.

## **Unit-3: Introduction to E-Commerce**

Definition and scope of e-commerce, Evolution of e-commerce, Types of e-commerce models (B2B, B2C, C2C), E-commerce platforms and technologies. Building an E-Commerce Website; Website design principles, Choosing a domain name and hosting provider, Payment gateways and security, User experience optimization. Digital Marketing for E-Commerce; Search engine optimization (SEO), Pay-per-click (PPC) advertising, Social media marketing, E-mail marketing.

## **Unit-4: E-Commerce Logistics and Fulfilment**

Order processing and fulfilment, Inventory management, Shipping and delivery options, Returns and customer



service. E-Commerce Analytics and Performance Measurement; Key performance indicators (KPIs) for e-commerce, Web analytics tools, Customer feedback and reviews. Scaling and Growth Strategies; Scaling an e-commerce business, International expansion, Strategic partnerships and collaborations, Exit strategies: mergers, acquisitions, IPOs

### **Case Studies: Analysis of successful e-commerce ventures**

### **Suggested Readings**

- ✓ Singh, K. (2008). *Rural Development - Principles, Policies, and Management*. New Delhi: Sage Texts.
- ✓ Samanta, R. K. (2000). *New Vista in Rural Development Strategies & Approaches*. Delhi: B.R. Publishing Corporation.
- ✓ Hussain, T., Tahir, M., & Tahir, R. (2017). *Fundamentals of Rural Development*. New Delhi: I. K. International Publishing House Pvt. Ltd.
- ✓ Sahu, B. K. (2003). *Rural Development in India*. New Delhi: Anmol Publications Pvt. Ltd.
- ✓ Dutta, S. K., & Ghosh, D. K. (2002). *Empowering Rural Women*. New Delhi: Akansha Publishing House.
- ✓ Dutta, S. K., & Ghosh, D. K. (2006). *Institutions for Development: The case of Panchayats*. New Delhi: Mittal Publications.
- ✓ Agarwala, K. N., Lal, A., & Agarwala, D. (2000). *Business on the Net: An Introduction to the whats and hows of E-commerce*. Noida, Uttar Pradesh: Macmillan Publishers India Limited.
- ✓ Awad, E. M. (2009). *Electronic Commerce from vision to fulfillment*. Delhi: PHI Learning.
- ✓ Bajaj, K. K., & Debjani, N. (2005). *E-Commerce*. New Delhi: Tata McGraw Hill Education.
- ✓ Chhabra, T. N., Jain, H. C., & Jain, A. *An Introduction to HTML*. Delhi: Dhanpat Rai & Co.
- ✓ Dietel, H. M., Dietel, P. J., & Steinbuhler, K. (2001). *E- Business and E- commerce for Managers*. New Jersey: Prentice Hall.
- ✓ Diwan, P., & Sharma, S. (2002). *Electronic commerce- A Manager's Guide to E- Business*. Delhi: Vanity Books International.
- ✓ Kosiur, D. (1997). *Understanding Electronic Commerce*. New Delhi: Prentice Hall of India Pvt. Ltd.
- ✓ Turban, E., King, D., Lee, J., Warkentin, M., Chung, H. M., & Chung, M. (2002). *Electronic Commerce: A Managerial Perspective*. New Jersey: Prentice Hall Publishing.
- ✓ Whiteley, D. (2000). *E-Commerce: Strategy, Technologies and Applications*. New York: McGraw Hill.

## Gardening and Vermicomposting

### Course Objectives:

- To introduce the students with the concept and importance of horticulture.
- To introduce the students with the methods for plant propagation.
- To introduce the students with the scope and importance of vermicomposting

### Course Outcomes:

- Students would understand the scope and importance of the horticulture.
- Students would get the skill to propagate the plants through asexual methods.
- Students would understand the importance and use of vermicomposting for horticulture.

### Unit-I:

Introduction to horticulture, importance of horticulture crops, Principle of crop production technology, essential plant nutrients and their deficiency symptoms, organic and inorganic manures, water management in horticulture crops

*LO: The students will know about the concept and importance of horticulture.*

### Unit-II:

Types of plant propagation, root curing and tubers, grafting, leaf cutting, runners and offsets, rooting media, rooting hormone, types of nursery bed, irrigation & protection

*LO: The students will be able to know how to do the plant propagation.*

**Unit-III:** Vermiculture: Definition, scope and importance; vermicomposting using garden waste; use of vermicomposting in garden

*LO: The students will be able to know and how to use the vermicomposting.*

### Practicals:

1. Identification and description of salient features of ornamental plants
2. Study of asexual propagation methods (grafting, cutting, layering)
3. Study of techniques for rooting
4. Study of irrigation techniques (drip irrigation)
5. Study of preparation of nursery bed.

### Text Books:

- ✓ Rao, K. M. (2005). *Textbook of horticulture*. Macmillan.

### Reference book:

- ✓ Don, M. (2021). *The Complete Gardener: A Practical, Imaginative Guide to Every Aspect of Gardening*. Dorling Kindersley Ltd.
- ✓ Solankey, S. S., Akhtar, S., Maldonado, A. I. L., Rodriguez-Fuentes, H., Contreras, J. A. V., & Reyes, J. M. M. (Eds.). (2020). *Urban Horticulture: Necessity of the Future*. BoD—Books on Demand.

## **Gender and Human Rights**

### **Course Objectives**

- The course aims to create basic awareness about equality of opportunity and access to public services, to sensitize and create better understanding about equality of opportunity in the access to justice, to create awareness regarding civic and social rights and responsibilities, to create awareness regarding consumer rights, to enhance understanding and sensitivity towards issues related to violence and to create awareness and sensitize towards identity (Linguistic, Cultural, Ethnic and Religious)
- This course is intended to make students aware of the ways in which gender is learned, the implications of gender in our lives, and prospects for change so far as men and women are able to combine and/or reject elements of traditional gender roles.
- The course will look at gender within the context of different social institutions and look at ways in which gender roles are maintained by these institutions, and/or effectively learned through socialization.

### **Unit-1**

Meaning and Concept of Human Rights

Classification of Rights: Natural, Moral and Legal Rights

Universal Declaration of Human Rights: An Overview

### **Unit-2**

Human Rights in Indian Context

Role of National Human Rights Commission

Human Rights of the Marginal and Vulnerable Groups

### **Unit-3**

Meaning and Concept of Gender Studies

Theoretical Approaches: Liberal, Marxist, and Radical

Gender and Law, Legal Rights of Women

### **Unit-4**

Gender and Society: Religion, Caste and Ethnicity

Gender and the Nation: Representation in the decision-making process

Gender and Economy: Land Rights and Workplace

### **Prescribed Texts**

- ✓ *A World of Equals: A Textbook on Gender Edited by: Susie Tharu; A. Suneetha; Uma Maheswari Bhrugubanda*

- ✓ *Introduction to Women, Gender, Sexuality Studies* by Miliann Kang, Donovan Lessard, Laura Heston, Sonny Nordmarken
- ✓ *Battered Women and Feminist Lawmaking and the Struggle for Equality* by Elizabeth M. Schneider

### **Suggested Readings**

- ✓ Jaswal, P.S. and Nishtha Jaiswal. 2010. *Human Rights and the Law*. New Delhi: A.P.H. Publishing Corporation.
- ✓ Lauterpacht. 1968. *International Law and Human Rights*. Continent: Show String Prince Inc. Agarwal, H.O, *Human Rights: Central Law Publications, Allahabad*
- ✓ Chandra, U. *Human Rights Allahabad Law Agency Publications*
- ✓ Yasin, Adil-UI & Archana Upadhyay (ed)) *Human Rights Akansha Publishing House, New Delhi, 2004*
- ✓ Bhasin, Kamala. (2000). *Understanding Gender*. New Delhi: Kali for Women.
- ✓ Geetha, v. (2000). *Theorising Feminism Gender*. Kolkata: Bhatkal & Sen.
- ✓ Lips, Hilary M. (2014). *Gender: The Basics*. New York: Routledge.
- ✓ Menon, Nivedita. (2012). *Seeing Like A Feminist*. New Delhi: Penguin Books.
- ✓ Yadav, C.P. (ed.) (2007) *Encyclopedia of Women's Problems and their remedies*. New Delhi: Aninol Publications.

## **Indian Administration**

**Course Outcomes:** Students will be able to

- To provide students a basic understanding of the evolution of Indian Administration
- To help students to gain knowledge about structural and functional dynamics of Indian administration.
- To Know the evolutionary period of Indian Administration.
- Define the concept of the fundamental rights and duties of Indian Citizens

### **UNIT 1: Evolution of Indian administration**

- Genesis of Indian Administration
- Government of India Act(s) of 1909, 1919, 1935.

### **UNIT 2: Salient Features of Indian Constitution**

- Fundamental Rights - its features and limitations
- Directive Principles of State Policy
- Fundamental Duties

### **UNIT 3: Federal Structure in India**

- Centre-state relations: Legislative, Administrative and Financial

### **UNIT 4: Union Administration**

- Central Secretariat, Cabinet Secretariat,
- Prime Minister's Office (PMO)

### **Text Books:**

- ✓ *B.L. Fadia and Kuldeep Fadia, (2014) "Indian Administration" Sahitya Bhawan, Agra;*
- ✓ *Bidyut Chakrabarty, Prakash Chand, (2016), "Indian Administration : Evolution and Practice" , SAGE Publications, New Delhi;*

### **Reference Books**

- ✓ *Amita Singh, (2005), Administration Reforms, Sage Publications, New Delhi*
- ✓ *Kuldeep Mathur, (2015), Government to Governance, National Book Trust*
- ✓ *Hoshier Singh and Pankaj Singh (2011), Indian Administration, Pearson, Delhi.*
- ✓ *S.R. Maheswari (2011), Indian Administration, New Delhi, Orient Longman.*
- ✓ *Pratap Bhanu Mehta & Nirja Gopal Jayal (2011), The Oxford Companion to Politics in India, Oxford University Press, New Delhi.*
- ✓ *Padmalaya Mahapatra, (2013), "Indian Administration: Central – State – District", Gyanayuga, Bhubaneswar*

## **Indian Economy and Society**

### **Course Description**

- This course aims to provide an overview of the contemporary discussions on economy, policy, gender and labour issues and environmental issues. This course will serve as a general studies paper for many competitive examinations and keep the student updated with the contemporary socio-economic issues. The course is multi-disciplinary one covering economics, political sciences, sociology and environmental sciences.

### **Course Outcomes**

- To gain the basic ideas on the Indian Economy, Indian political system, environmental concerns, gender perspectives, and issues of labour rights.
- To understand the growth of the Indian Economy and its sectoral composition.
- To know the distribution of powers between centre state and local governments; and the role of finance commissions in transferring funds to PRIs and ULBs.
- To familiarise and sensitize students about gender concerns and labour rights issues, besides the environmental concerns, and national and global initiatives to halt the degradation of the environment.

### **Unit I: Macroeconomic scenario: GDP Growth and Sectoral composition**

- India's GDP growth in recent years. Contribution of Agriculture and allied activities, Industry and service sectors to GDP and growth of these sectors in the recent years. Major government initiatives taken by the government to strengthen the economic growth and sectoral growth.
- *LO: This module will educate the students on India's recent scenarios of GDP growth, sectoral composition, and government initiatives to strengthen economic growth.*

### **Unit II: Indian polity: Centre and state relation, role of PRIs and ULBs**

- Division of power between centre and states: Union List, State list and Concurrent list. Major expenditure obligations and revenue raising abilities of the Union and the state government. 73rd and 74th Constitutional amendments PESA. Status of State Finance Commissions and devolution of functions .functionaries and funds to PRIs and ULBs in India
- *LO: This module will educate the students on the distribution of powers between unions, states, and local governments and the status of state finance commissions in the devolution of funds to Panchayat Raj Institutions and Urban Local Bodies.*

### **Unit III: Gender and Labour issues:**

- The ideas of Gender. Gender, work and organisation: accounting women's work; impact of policies of globalization on women's work; gender inequality and labour force participation; gender justice and human rights
- Labour Market: wage employment vs self-employment; wage differentials; skill mismatch and productivity; reasons for declining labour share in national income, social security and labour welfare; Labour market regulations and it's impact on employment
- *LO: This module will educate students about the basic concepts of gender-related issues, and labour rights.*

#### **Unit IV: Environmental Concerns:**

- Threats of climate change and actions: Observed Changes, Impacts, and attribution; Responses undertaken to date. Current mitigation and adaptation actions, and Policies are not sufficient; Understanding Net Zero CO<sub>2</sub> and Net zero GHG emissions.
- *LO: This module will sensitize the students about the threats of climate change, mitigation, adaptation, and commitment of nations to achieve Net Zero emissions.*

#### **Basic Readings:**

- ✓ For Module I please refer to Economic Survey of India latest year
- ✓ For Module II please refer to the 7th Schedule of the Indian Constitution and Latest Finance Commission of India Report, Chapter on local governments
- ✓ For Module III:
  - (a) Government of India (1974), Towards Equality : Report of the Committee on the Status of Women in India, Dept. Of Social Welfare, Ministry of Education and Social Welfare
  - (b) Mazumdar, Vina (1983), Women, Work and Employment: Struggle for a Policy, ICSSR, New Delhi
  - (c) Borjas, George J. Labor Economics. 5th ed. Boston, MA: McGraw-Hill/Irwin, 2010
  - (d) Orley Ashenfelter, Richard Layard, David E. Card (1986), Handbook of labor economics, 1st Edition, North-Holland
- ✓ For Module IV please refer to the Section 2 of Synthesis Report of The IPCC Sixth Assessment Report (AR6) longer Report IPCC IPCC\_AR6\_SYR\_LongerReport.pdf

## **Introduction to Web Technologies**

### **Course Objectives:**

- To learn the fundamentals of web designing.
- To design and develop standard and interactive web pages.

### **Learning Outcomes:**

Upon completion of this course, students will be able to:

- Understand Internet, Internet Protocols, and World Wide Web
- Understand HTML and its tags
- Learn the design and development of web pages
- Learn the styles/layouts of web pages using CSS & client-side scripting using JavaScript

### **UNIT-1:**

- Introduction to Internet, Internet Protocols, World Wide Web (WWW): Introduction, History, HTTP, Web Browser, Web Server with example, Web page, working principles of WWW. Web Development: Introduction, Front-end and Backend Development Technologies. Concepts of Client-Server communication.
- Introduction to HTML: Introduction, Characteristics, Advantages and Disadvantages of HTML, HTML Editors, Understanding elements in HTML, Container and empty elements, Basic Tags and Attributes: `<!DOCTYPE>`, `<HTML>`, `<HEAD>`, `<TITLE>`, `<BODY>`, `<P>`, Attributes of the basic tags. Creating a Simple HTML Web Page, running a web page in the browser.

### **UNIT-2:**

- Working with HTML Tags: Headings, Break, Horizontal Line. Formatting Text with HTML Elements: Italic, Bold, Small, Subscript, Superscript and changing background color. Adding Comments in HTML. Working with Hyperlink, List, Table, Image, Video, and Frames in HTML.
- Creating Forms in HTML: Form Tag and its attributes. Creating Text box, Password box, Text area, Drop-down list, Checkbox, Radio button, Email, Color picker, Date-Time picker, Submit and Reset buttons.

### **UNIT-3:**

- Cascading Style Sheets (CSS): Introduction, Benefits of using CSS, Understanding the Syntax, CSS Selectors, Using CSS: External, Internal Inline CSS. Comments in CSS,
- Basic CSS Properties: Color, Background, Text, Font, List, Display. CSS Box Model: Introduction, working with Margin, Border, and Padding. Working with CSS Navigation Bar and Drop-Downs.

### **UNIT-4:**

- JavaScript: Introduction, Features, Benefits, Creating Simple JavaScript. Using JavaScript in HTML: Use in the Head, Body and as external script file. Exploring Popup Boxes: alert, confirm, prompt box. Display Possibilities: innerHTML, document.write(), window.alert(), console.log().
- Programming using JavaScript: Introduction to Data types, Variables, Operators, Expressions (Arithmetic, String, Logical), Comments. Control Statements: Selection



Statements: if, if...else, nested if...else, else...if ladder, switch. Loops: while, do...while, for. Jump Statements: break, continue. Functions in JavaScript: built-in and user defined, Invoking a function, scope of a function, global vs local variables.

**Text Book:**

- ✓ *Web Technologies (Black Book), DreamTech Press*

**Reference Books:**

- ✓ *Web Enabled Commercial Application Development Using HTML, JavaScript, DHTML and PHP 4th Edition by Ivan Bayross.*
- ✓ *HTML, XHTML and CSS Bible, 5ed, Wiley India-Sтивен M. Schafer.*

**ବହୁମୁଖୀ ପାଠ୍ୟସଭା**  
**Multidisciplinary Course**  
**ପ୍ରଥମ ପତ୍ର**  
**ତୁଳନାତ୍ମକ ସାହିତ୍ୟ**

**Course Outcome (ପାଠ୍ୟପତ୍ର ଫଳଶ୍ରୁତି):**

ବିବିଧ ଭାଷାର ସାହିତ୍ୟ ମଧ୍ୟରେ ତୁଳନାତ୍ମକ ଅଧ୍ୟୟନ ସାମ୍ପ୍ରତିକ ସମୟର ଏକ ପ୍ରାସଙ୍ଗିକ ବିଷୟ । ଏହାଦ୍ୱାରା ବିଶ୍ୱ ପରିପ୍ରେକ୍ଷୀରେ ସାହିତ୍ୟିକ ସମ୍ପର୍କ ବୁଝିପାଏ ଓ ବିଶ୍ୱ କଲ୍ୟାଣ ସାଧୁତହୁଏ । ସ୍ନାତକଶ୍ରେଣୀର ବିଦ୍ୟାର୍ଥୀମାନେ ତୁଳନାତ୍ମକ ସାହିତ୍ୟ ଅଧ୍ୟୟନ ମାଧ୍ୟମରେ ବିବିଧଭାଷା ଓ ସାହିତ୍ୟର ଜ୍ଞାନ ଆହରଣ କରିପାରିବେ । ତେଣୁ ବହୁମୁଖୀ ପାଠ୍ୟସଭାରେ ତୁଳନାତ୍ମକ ସାହିତ୍ୟ ଅତ୍ୟନ୍ତ ଉପାଦେୟ ହେବ ।

**Unit wise Learning Outcome (ପ୍ରତି ଏକକର ଅଧ୍ୟୟନ ଫଳଶ୍ରୁତି):**

୧ମ ଏକକ : ତୁଳନାତ୍ମକ ସାହିତ୍ୟର ଚାରିକଦିଗ ଉପରେ ଛାତ୍ରଛାତ୍ରୀ ଏଠାରେ ଅବଗତ ହୋଇପାରିବେ । ବିଶେଷତଃ ତୁଳନାତ୍ମକ ସାହିତ୍ୟର ସଂଜ୍ଞା, ସ୍ୱରୂପ ଓ ବିବିଧରୂପ ଜାଣିପାରିବେ ।

୨ୟ ଏକକ : ସଂସ୍କୃତ ହେଉଛି ଭାରତର ସର୍ବପ୍ରାଚୀନ କାବ୍ୟଭାଷା । ସଂସ୍କୃତ ସାହିତ୍ୟର ବିଖ୍ୟାତ କବି ଓ ନାଟ୍ୟକାର କାଳିଦାସଙ୍କ ସୁପ୍ରସିଦ୍ଧ 'ଅଭିଜ୍ଞାନ ଶାକୁନ୍ତଳମ୍' ନାଟକ ଓ ଆଧୁନିକ ଓଡ଼ିଆ କାବ୍ୟକାର ଗଙ୍ଗାଧରଙ୍କ 'ପ୍ରଣୟବଲ୍ଲରୀ'ର ତୁଳନାତ୍ମକ ଅଧ୍ୟୟନ କରିବାପାଇଁ ଏହି ଏକକରେ ସୁଯୋଗ ରହିଛି ।

୩ୟ ଏକକ : ହିନ୍ଦୀ ଭାରତର ରାଷ୍ଟ୍ର ଭାଷା । ଏହି ଭାଷାର ବିଖ୍ୟାତ ଲେଖକ ପ୍ରେମଚନ୍ଦ୍ରଙ୍କ ଗୋଦାନ ଉପନ୍ୟାସ ଓ ବିଶ୍ୱସ୍ତ ଓଡ଼ିଆ କଥାକାର ଫକୀରମୋହନଙ୍କ 'ଛମାଣ ଆଠଗୁଣ୍ଠ'ର ତୁଳନାତ୍ମକ ସମୀକ୍ଷା ବେଶ୍ ଗୁରୁତ୍ୱ ରଖେ । ଏହି ଏକକରୁ ବିଦ୍ୟାର୍ଥୀମାନେ ତୁଳନାତ୍ମକ ଜ୍ଞାନ ଅର୍ଜନ କରିବେ ।

୪ର୍ଥ ଏକକ: ନୋବେଲ ପୁରସ୍କାର ପ୍ରାପ୍ତ The Waste Land ଗ୍ରନ୍ଥଟି ବିଶ୍ୱବ୍ୟାପୀ ପ୍ରଭାବ ବିସ୍ତାର କରିଛି । ତାହା ସହିତ ଯଶସ୍ୱୀ ଆଧୁନିକ କବି ଗୁରୁପ୍ରସାଦଙ୍କ କାଳପୁରୁଷର କିପରି ସାମାଜିକ ବା ତାରତମ୍ୟ ରହିଛି , ଛାତ୍ରଛାତ୍ରୀ ତାହା ଏଠାରେ ଅନୁଶୀଳନ କରିବେ ।

## ପାଠ୍ୟ ବିଷୟ

୧ମ ଏକକ : ତୁଳନାତ୍ମକ ସାହିତ୍ୟ: ସଂଜ୍ଞା, ସ୍ୱରୂପ ଓ ପ୍ରକାରଭେଦ

୨ୟ ଏକକ : ସଂସ୍କୃତ ଓ ଓଡ଼ିଆ : ଅଭିଜ୍ଞାନ ଶାବୁତଳମ୍ ଓ ପ୍ରଣୟବଲ୍ଲରୀ

୩ୟ ଏକକ : ହିନ୍ଦୀ ଓ ଓଡ଼ିଆ

ଗୋଦାନ - ପ୍ରେମଚନ୍ଦ ଓ ଛମାଣ ଆଠଗୁଣ୍ଠ-ପକାରମୋହନ ସେନାପତି

୪ର୍ଥ ଏକକ : ଇଂରାଜୀ ଓ ଓଡ଼ିଆ: The Waste Land- T.S.Eliot ଓ କାଳପୁରୁଷ- ଗୁରୁପ୍ରସାଦ ମହାନ୍ତି

**ସହାୟକ ଗ୍ରନ୍ଥସୂଚୀ (Book of references):**

୧. ସାହିତ୍ୟ ତତ୍ତ୍ୱ : ପ୍ରାଚ୍ୟ ପାଶ୍ଚାତ୍ୟ – ଜ୍ୟୋତ୍ସ୍ନାମୟୀ ପ୍ରଧାନ, ଫୋକ୍ସ ପବ୍ଲିଶର୍ସ, କଟକ

୨. ପାଶ୍ଚାତ୍ୟ ସାହିତ୍ୟ ଓ ସମୀକ୍ଷା ତତ୍ତ୍ୱ - ସଂ. କୃଷ୍ଣଚନ୍ଦ୍ର ପ୍ରଧାନ, ପ୍ରାଚୀ ସାହିତ୍ୟ ପ୍ରତିଷ୍ଠାନ, କଟକ

୩. ସାମ୍ପ୍ରତିକ ପାଶ୍ଚାତ୍ୟ ସମୀକ୍ଷାତନା ତତ୍ତ୍ୱ – ଚିତ୍ତ ରଞ୍ଜନ ମିଶ୍ର, ଗ୍ରନ୍ଥ ମନ୍ଦିର, କଟକ

୪. ପାଶ୍ଚାତ୍ୟ ସମୀକ୍ଷାତନା ତତ୍ତ୍ୱ – ଜିତେନ୍ଦ୍ର ନାରାୟଣ ପଟ୍ଟନାୟକ

୫. ତୁଳ୍ୟ କଷ୍ଟି – ସତ୍ୟେଶ ତ୍ରିପାଠୀ, ଏଥେନା, କଟକ

୬. ଗବେଷଣା ଅନୁବାଦ ଓ ସମୀକ୍ଷାତନା – ନାରାୟଣ ସାହୁ, ସତ୍ୟ ନାରାୟଣ ବୁକ୍ ଷୋର, କଟକ

**ନମୁନା ପ୍ରଶ୍ନ (Sample Questions) :**

୧. କାହାକୁ ତୁଳନାତ୍ମକ ସାହିତ୍ୟର ପିତା ବୋଲି କୁହାଯାଏ ? (୧ ମାର୍କ)

୨. ବିଶ୍ୱର କେଉଁ ଦୁଇଜଣ ପ୍ରସିଦ୍ଧ କବି ତଥା ନାଟ୍ୟକାରଙ୍କ ଉପରେ ମାୟାଧର ମାନସିଂହ ତୁଳନାତ୍ମକ ଗବେଷଣା କାର୍ଯ୍ୟ କରିଛନ୍ତି?  
(୨ ମାର୍କ)

୩. ଗୋଦାନ ଓ ଛମାଣ ଆଠଗୁଣ୍ଠର ପାଞ୍ଚୋଟି ସାମଞ୍ଜସ୍ୟ ଲେଖ । (୫ ମାର୍କ)

୪. ଦୁଷ୍ମନ୍ତ ଚରିତ୍ରକୁ ଚିତ୍ରଣ କରିବାରେ କାଳିଦାସ ଓ ଗଙ୍ଗାଧରଙ୍କ ଦୃଷ୍ଟିକୋଣର ତୁଳନା କର । (୮ ମାର୍କ)

# Philosophy of Bhagavad Gita

## Introduction:

This course on the philosophy of the Bhagavad Gita will offer a comprehensive exploration of the profound philosophical and spiritual teachings found within this ancient Indian text, and provide its applications in Modern life situations, particularly when guidance is required for very many problems in life.

## Course Outcomes:

- Understanding of the ideal of dharma and its role in a civilized society,
- Understanding of the role and importance of knowledge, action, and devotion in life.
- Knowledge of leading life with a sense of detachment.

## Learning Outcome

- **Unit-I** Yoga is to purify our actions, Yoga is to control the mind and senses and Yoga is to link oneself to Supreme with devotion. Yoga is the path of selfless actions without expecting the consequences or results. the spiritual seeker acts according to Dharma (righteousness).
- **Unit-II** An important philosophical concept in Karma yoga, it means to act unselfishly, or without personal gain in mind. When acting out of Nishkama Karma, an individual is acting or acting without any expectation that good will be returned to him/her or without attachment to its fruits.
- **Unit-III** Jnana yoga encourages its adepts to think and speak of themselves in the third person as a way to distance themselves from the Ego and detach their eternal self (atman) from the body-related one (*māyā*).
- **Unit-IV** the Bhagavad Gita places great emphasis on devotion to God. Through devotion, an individual can attain the ultimate truth and realize their unity with the divine. This path of devotion is accessible to all, irrespective of their social standing or spiritual knowledge.

## Unit-I:

Dharma:- Varnadharma, Svabhava, Sadharma- Paradharma

## Unit-II:

Karma:- Classification of Karma; Sense of Agency, Nişkāma Karma, Lokasaṅgraha, Relation between Karma Yoga and Jñāna yoga.

## Unit-III:

Jnana:- Distinction between Jnana and Vijñāna. Criteria of True Knowledge (Buddhi Yoga & Jñāna Yoga), Kṣetra, Kṣetrajña, Puruṣottama. Sāttvika, Rājasika and Tāmasika Jñāna

## Unit-IV:

Bhakti Yoga:- Four kinds of devotees, Characteristics of Ideal Bhakti- Saranāgati & Prapattikrupa (grace);

Relation between Bhakti Yoga & Jñāna Yoga

### Prescribed Books

- ✓ *S. Radhakrishnan, the Bhagavad Gītā (Trs. & Ed.)*
- ✓ *S. C. Panigrahi, the Concept of Yoga in the Gita, Prajnaloka, Puri*

### Reference Books

- ✓ *K. M. Munshi & R. R. Diwakar, Bhagavad Gītā & Modern Life*
- ✓ *Basanta Kumar Dash, Philosophy of Isopanisad and the Gita, Gyanajuga Publication, Bhubaneswar*
- ✓ *G. K. Warriar, Śrīmad Bhagavad Gītā Bhāṣya of Sri Sankarāchārya: (Trs), Advaita Ashram, Ramakrishna Math.*
- ✓ *P. N. Srinivasachari, the Ethical Philosophy of Gītā.*
- ✓ *Pandita Nilakantha Das, Srimad Bhagavad Gītā, New Students Store Binod Vihari, Cuttack.*
- ✓ *Viharilal Pandits ed., Śrīmad Bhagavad Gītā, (Odia) Dharma Grantha Store, Cuttack.*

### E- Recourses

1. <https://youtu.be/bedsn7xIn0w?si=VW5iQdLgDu5UDhA6>
2. [https://anubooks.com/uploads/session\\_pdf/16623612876.pdf](https://anubooks.com/uploads/session_pdf/16623612876.pdf)
3. <https://ijcrt.org/papers/IJCRT2101218.pdf>
4. <https://youtu.be/HHIv6qJlRjI?si=MML5aslZRwUvE1Rl>
5. [https://en.wikipedia.org/wiki/Jnana-Vijnana\\_Yoga](https://en.wikipedia.org/wiki/Jnana-Vijnana_Yoga)
6. [https://en.wikipedia.org/wiki/Bhakti\\_yoga](https://en.wikipedia.org/wiki/Bhakti_yoga)

Sample Questions: 1 for Part- I Objective; Part- II Very Short Type (in 50 Words); Par-III Short Type (in 250 Words); Par-IV Long Type (in 800 Words);

### Unit – I

1. Dharma Literally Means \_\_\_\_\_?
2. What Is Sreya?
3. What Is Varna Dharma?
4. What Is the Meaning of Dharma In the Bhagavad Gita? Discuss.

### Unit – II

1. \_\_\_\_\_ is the Vikarma?
2. Distinguish Between Karma, Vikarma, and Akarma.
3. Who Is Fit to Follow the Path of Jnana?
4. Discuss the Concept of Bondage and Liberation In the Bhagavad Gita

### **Unit – III**

1. \_\_\_\_\_ Is Called Ksetra?
2. State the Characteristics of Tamasika Jnana.
3. State the Characteristics of Sattvika Jnana.
4. Explain the Jnana of the Bhagavad Gita and illustrate its Significance.

### **Unit – IV**

1. \_\_\_\_\_ Is the Highest State of Bhakti?
2. How Jnana and Bhakti Are Related?
3. How Can One Attain the Highest State Niskama Bhakti?
4. What Are the Characteristics of A True Devotee? Discuss.

# Professional Writing

## Course Objectives

- The course aims at teaching students to write grammatically correct, clear, effective prose and applies it to writing for the workplace.
- Its objective is to help students develop writing skills and acquire the knowledge to apply these skills in standard workplace document formats.
- It includes a study of writing in a variety of professional contexts with an emphasis on assessing rhetorical situations and crafting messages to inform and persuade diverse audiences in a variety of forms and formats.

## Unit-1

Writing: Definition and Requirement

Writing Process: Prewriting, Writing and Post writing

Basic Writing Skills

Plain English

## Unit-2

Genres of Writing: Persuasive, Expository, Narrative, Descriptive and Argumentative

## Unit-3

Basic forms: Letters, Application, Memo, Notices and Minutes

Raising the Bar: Presentations, Proposal, and Report

## Unit-4

The Elements of Style: Grammar, Usage, and Mechanics

## Prescribed Texts

- ✓ *The Craft of Professional Writing*, Second Edition by Michael S. Malone
- ✓ *Literature and Art of Communication*. Parhi, Pati, Mohol et al. Cambridge University Press, 2019.
- ✓ *Professional Writing Skills: A Write It Well Guide* by Natasha Terk

## Suggested Readings

- ✓ Huddleston R., and Geoffrey K. Pulia, eds. *A Student's Introduction to English Grammar*. CUP.2005

- ✓ *MLA Handbook for Writers of Research Papers. Eighth edition. Modern Language Association of America. 2021*
- ✓ *Excellence In Business Communication by John V. Thill and Courtland L. Bovee*  
*On Writing Well by William Zinsser*

<https://communicationprogram.wharton.upenn.edu/library/>

<https://www.osou.ac.in/eresources.php>



## PROGRAMING IN C++

### Course Objective:

The objective of the course is to learn the basics about C++ programming language such as variables, data types, arrays, pointers, functions and classes etc. On successful completion this course, students will acquire a good understanding about the concept of object-oriented programming using C++ and be able to write and read basic C++ code.

**Learning Outcome:** On the completion of this course, students will be able to

- Learn to understand different types of data by C++ language.
- Learn different symbols used in the programming language representing the text variables and constants.
- Learn to develop various operators, loops and nested control statements.
- Learn to generate functions, local and global variables, 1D and 2D array in C++ programe.

### UNIT-I

Introduction to structured programming: data types- simple data types, floating data types, character data types, string data types, arithmetic operators and operators precedence.

### UNIT-II

Variables and constant declarations, expressions, input using the extraction operator >> and cin, output using the insertion operator << and cout, preprocessor directives, increment (++) and decrement (--) operations.

### UNIT-III

Creating a C++ program, input output, relational operators, logical operators and logical expressions, if and if-else statement, switch and break statements, for, while and do-while loops, continue statement, nested control statement.

**UNIT-IV** Functions, value returning functions, value versus reference parameters, local and global variables, one dimensional array, two dimensional array, pointer data and pointer variables.

### Books Recommended

- ✓ *D. S. Malik: C++ Programming Language, Course Technology, Cengage Learning, India Edition, 2009.*
- ✓ *E. Balaguruswami: Object oriented programming with C++, fifth edition, Tata Mc Graw Hill Education Pvt. Ltd., 2008*

### Books For Reference

- ✓ *R. Johnsonbaugh and M. Kalin-Applications Programming in ANSI C, Pearson Education.*

- ✓ *S. B. Lippman and J. Lajoie, C++ Primer, 3rd Ed., Addison Wesley, 2000.*
- ✓ *Bjarne Stroustrup, The C++ Programming Language, 3rd Ed., Addison Wesley, 2010.*
- ✓ *Suggested digital platform: NPTEL/SWAYAM/MOOCs*
- ✓ *e-Learning Source <http://ndl.iitkgp.ac.in> ; <http://ocw.mit.edu> ; <http://mathforum.org>*

## **Samskrta –Sastra- Paricyah**

### **Unit-I**

General Idea about the following Samhitas: Rgveda, Yajurveda, Samaveda and Atharva Veda.

### **Unit-II**

General Idea about the following Upanisadas: Isa, Kena, Katha, Prashna, Munda, Mandukya, Taittiriya, Aitareya, Chandogya and Brhadaranyaka.

### **Unit-III**

General Idea about the following Epics & Puranas: Ramayana, Mahabharatam and 18 Mahapuranas

### **Unit-IV**

General Idea about the following Kavyas: Haravijayam, Buddhacaritam, Saundaranandam, Raghvamsam, Kumarasambhavam, Kiratarjuniyam, Sisupalavadham, Naisadhiyacaritam, Meghadutam, Vasavadatta, Kadambari, Harshacaritam, Dasakumaracaritam, Abhijnanasakuntalam, Pancatantram and Hitopadesah.

### **Core Readings:**

- ✓ *History of Sanskrit Literature, A.A. Macdonell, MLBD, Delhi, 2003*
- ✓ *Samskrta Sahitya ka Itihasa, Baladev Upadhyaya, Sarada Niketan, Varanasi*

### **Suggested Readings:**

- ✓ *Samskrta Sahitya Itihasa, H.K. Satapathy, Kitab Mahal, Cuttack.*

## Science, Technology and Society

The role of science and technology has become essential in every aspect of human life. Further, the new development in the global order has broadened the scope of science and technology in society. It is crucial to understand how science and technology shape the society and vice-versa.

### Course Outcome:

By the time the students have completed this course, they will be able to understand the relationship between science and society, and the conceptual and theoretical issues in the study of sociology of science.

### Unit-I: Building the Concepts of Science, Technology and Society

- 1.1 Scientific Revolution and the Era of Enlightenment
- 1.2 Science- the basic tenets, difference between Science and Common Sense
- 1.3 Technology-The Basic Features, history of technological development.
- 1.4 Relationship between Society, Science and Technology, E-governance, Surveillance Society

**Learning Outcome:** Students will be able to explain the relationship between science, technology and society.

### Unit-II: India's Progress in Science through Ages

- 2.1 Science in different periods in India: Ancient, Medieval and Modern
- 2.2 Globalization and the new Scientific Revolution
- 2.3 The rise of Information and Knowledge Society
- 2.4 Science, Technology and Social Deliverables, Technology & emerging political process, Global and India

**Learning outcome:** Students will be able to analyse the development of science at global and national level from a historical perspective.

### Unit-III: Science and Technology Education and Research

- 3.1 Popularising Science and Technology education in India
- 3.2 The building of iconic scientific and technological institutions
- 3.3 Privatization of Scientific and Technological Education
- 3.4 STEM Education: Students enrolment and challenges

**Learning Outcome:** Students will be able to demonstrate an understanding of recent changes in science and technology education and the shift of research domain.

### Unit-IV: India's Policies for Science and Technology

- 4.1 Scientific Policies and Programmes under five-year plans
- 4.2 Incentivising science and technology education in educational institutions.
- 4.3 Department of Science and Technology (DST)
- 4.4 Policies and programmes for expanding science and technology education, State policies, Digital Divide & Inclusion.

**Learning Outcome:** Students can explain the scientific policies and programmes launched time to time, disciplinary specialisation of science, inclusivity and digital divide.

Lesson Plan:

Unit	Thrust Areas	Method	Total No. of Classes	References
I	Building the Concepts of Science, Technology and Society Scientific Revolution and the Era of Enlightenment Science- the basic tenets, difference between Science and Common Sense Technology-The Basic Features, history of technological development. Relationship between Society,	Theory class and Tutorial class	15	(1) Gobo, G., & Marcheselli, V. (2023). <i>Science, Technology and Society: An Introduction</i> . Springer Nature. (2) Bridgstock, M. (1998). <i>Science, technology and society: an introduction</i> . Cambridge University Press. (3) Science Technology and Society Studies by Sangeeta Dey. UGC e-Adhyayan.  Link: <a href="https://ebooks.inflibnet.ac.in/antp10/chapter/science-technology-and-society-studies/">https://ebooks.inflibnet.ac.in/antp10/chapter/science-technology-and-society-studies/</a>  Video Lecture: Science, Technology and Society By

	Science and Technology, E-governance, Surveillance Society			Prof. Sambit Mallick, IIT Guwahati  Link: <a href="https://youtube.com/@sciencetechnologyandsociet6773?si=H_9KAALzU7y4BGfw">https://youtube.com/@sciencetechnologyandsociet6773?si=H_9KAALzU7y4BGfw</a>
II.	India's Progress in Science through Ages Science in different periods in India: Ancient, Medieval and Modern Globalization and the new Scientific Revolution The rise of Information and Knowledge Society Science, Technology and Social Deliverables, Technology & emerging political process, Global and India	Theory class and Tutorial class	15	Science Technology and Society Studies by Sangeeta Dey. UGC e-Adhyayan.  Link: <a href="https://ebooks.inflibnet.ac.in/antp10/chapter/science-technology-and-society-studies/">https://ebooks.inflibnet.ac.in/antp10/chapter/science-technology-and-society-studies/</a>  Video Lecture: Science, Technology and Society By Prof. Sambit Mallick, IIT Guwahati  Link: <a href="https://youtube.com/@sciencetechnologyandsociet6773?si=H_9KAALzU7y4BGfw">https://youtube.com/@sciencetechnologyandsociet6773?si=H_9KAALzU7y4BGfw</a>
III	Science and Technology Education and Research Popularising Science and Technology education in India The building of iconic scientific and technological institutions Privatization of Scientific and Technological	Theory class and Tutorial class	15	Science Technology and Society Studies by Sangeeta Dey. UGC e-Adhyayan.  Link: <a href="https://ebooks.inflibnet.ac.in/antp10/chapter/science-technology-and-society-studies/">https://ebooks.inflibnet.ac.in/antp10/chapter/science-technology-and-society-studies/</a>  Video Lecture: Science, Technology and Society By Prof. Sambit Mallick, IIT Guwahati  Link: <a href="https://youtube.com/@sciencetechnologyandsociet6773?si=H_9KAALzU7y4BGfw">https://youtube.com/@sciencetechnologyandsociet6773?si=H_9KAALzU7y4BGfw</a>

	Education STEM Education: Students enrolment and challenges.			
IV	India's Policies for Science and Technology Scientific Policies and Programmes under five-year plans Incentivising science and technology education in educational institutions. Department of Science and Technology (DST) Policies and programmes for expanding science and technology education, State policies, Digital Divide & Inclusion.	Theory class and Tutorial class	15	Science Technology and Society Studies by Sangeeta Dey. UGC e- Adhyayan.  Link: <a href="https://ebooks.inflibnet.ac.in/antp10/chapter/science-technology-and-society-studies/">https://ebooks.inflibnet.ac.in/antp10/chapter/science-technology-and-society-studies/</a>  Video Lecture: Science, Technology and Society By Prof. Sambit Mallick, IIT Guwahati  Link: <a href="https://youtube.com/@sciencetechnologyandsociety6773?si=H_9KAALzU7y4BGfw">https://youtube.com/@sciencetechnologyandsociety6773?si=H_9KAALzU7y4BGfw</a>

#### Text book:

- ✓ Gobo, G., & Marcheselli, V. (2023). *Science, Technology and Society: An Introduction*. Springer Nature.
- ✓ Bridgstock, M. (1998). *Science, technology and society: an introduction*. Cambridge University Press.

#### References:

- ✓ Aggarwal, V. (2018). *Leading science and technology: India next?* New Delhi: Sage  
○ Publisher.
- ✓ Arnold, David. 2004. *The New Cambridge History of India: III Science, Technology and medicine in Colonial India*. Cambridge: Cambridge University Press



- ✓ Baber, Zaheer. 1996. *The Science of Empire: Scientific Knowledge, Civilization, and Colonial Rule in India*. New York: State University of New York Press.
- ✓ Bauchspies, Wenda K., Jennifer Croissant, and Sal Restivo. 2006. *Science, Technology and Society: A Sociological Approach*. USA: Blackwell Publishing.
- ✓ Merton, R. K. (1938). *Science, technology and society in seventeenth century England*. *Osiris*, 4, 360-632.
- ✓ Merton, R. K. (1963). *The ambivalence of scientists*. *Bulletin of the Johns Hopkins Hospital*, 112, 77-97.
- ✓ Pattnaik, Binay Kumar. (2013). *Readings in Indian Sociology: Volume IV Sociology of Science and Technology in India*, New Delhi: Sage Publications

#### **E-resources:**

1. Science Technology and Society Studies by Sangeeta Dey. UGC e-Adhyayan.  
<https://ebooks.inflibnet.ac.in/antp10/chapter/science-technology-and-society-studies/>
2. Science, Technology and Society By Prof. Sambit Mallick, IIT Guwahati  
Link: [https://youtube.com/@sciencetechnologyandsociet6773?si=H\\_9KAALzU7y4BGfw](https://youtube.com/@sciencetechnologyandsociet6773?si=H_9KAALzU7y4BGfw)

### **Sample Questions**

#### **Part-I**

Fill in the Blanks (1x12)

- (b) Sociologist \_\_\_\_\_ discussed about the Science, technology and society in seventeenth century England.

#### **Part-II**

Answer any 8 questions within two or three sentences. (2x8)

- (b) What is science?

#### **Part -III**

Answer any 8 questions within 75 words each. (3x8)

- (b) What is STEM education?



#### **Part-IV**

**Answer all the within 500 words each. (7x4)**

- (b) Discuss India's Progress in Science through Ages citing suitable examples.

## **Sustainable Tourism**

### **Unit-I:**

*LO. Define sustainable tourism, its essence, emergence and issues. They also understand the roles of key actors in promoting sustainable tourism.*

Defining Sustainable Tourism, Emergence and Significance of Sustainable tourism, Key actors (WTO, WTTC, UN, PATA) and major Issues of Sustainable Tourism, Managing Sustainable Tourism in 21<sup>st</sup> Century.

**Unit II LO.** *Differentiate types, factors and trends of tourism at local and global context.*

- Types of Tourism (Nature tourism , ecotourism, cultural tourism, adventure tourism, medical tourism, pilgrimage, Space tourism, international, national), Factors Affecting the Growth of Tourism , Recent Trends of Tourism: International and Regional, Domestics (India)
- Impact of Tourism on Economy, Environment and Society; Tourism in India: Tourism Infrastructure and hospitality Industry, National Tourism Policy, Ecotourism with Reference to Odisha

### **Unit-III: Practical**

*LO. Analyse the impacts of tourism on geographical, environmental and socio-cultural aspects along with national tourism policies of India. create a project report on local/regional/national tourism and its challenges and future prospects and develop presentation skills.*

1. Preparation-cum-presentation of a Project report on present status, key challenges and future prospects of eco-tourism in Odisha.
2. Viva-Voce.

#### **Text Books:**

1. Boniface, B. and Cooper, C (2005). *The Geography of Travel and Tourism*. Butterworth.
2. Fennell, David A. (2020). *Sustainable Tourism: Principles, Contexts and Practices*, Channel View Publications.

#### **Reference Books:**

- ✓ Alan, A. Lew, (2017). *New Research Paradigms in Tourism Geography*. Routledge.
- ✓ Dhar, P.N. (2006). *International Tourism: Emerging Challenges and Future Prospects*. New Delhi, India: Kanishka
- ✓ Edgell, D. L. Sr. (2020) *Managing Sustainable Tourism: A Legacy for the Future*, NY, Routledge.
- ✓ Hall, M., and Stephen, P. (2006). *Geography of Tourism and Recreation – 85 Environment, Place and Space*. London, UK: Routledge.
- ✓ Harris, R., Griffin, T. and Williams (2002, Ed.) *Sustainable Tourism: A global perspective*. Great Britain, Elsevier, Butterworth Heinemann.
- ✓ Kamra, K. K., and Chand, M. (2007). *Basics of Tourism: Theory, Operation and Practise*. Pune, India: Kanishka Publishers.
- ✓ Milton, D. (1993). *Geography of World Tourism*. NY, USA: Prentice. Hall.
- ✓ Nelson, V. (2017): *An Introduction to the Geography of Tourism*. NY, USA: Rowman & Littlefield.
- ✓ Nigel, D. (2007). *Morpeth Religious Tourism and Pilgrimage Festivals Management: An International perspective by CABI*. USA: Cambridge.
- ✓ Page, S. J. (2011). *Tourism Management: An Introduction*. USA: Butterworth Heinemann.
- ✓ Ritchie, J R Brent and Crouch, Geoffrey I (2003). *The competitive destination: a sustainable tourism perspective*. CABI Pub
- ✓ Robinson, H. A. (1996). *Geography of Tourism*. London, UK: Macdonald and Evans.
- ✓ Weaver, D. (2006) *Sustainable Tourism: Theory and Practice*. Great Britain, Elsevier

# Vector Borne Diseases and Epidemiology

## Program Outcomes

- The multidisciplinary programme is incorporated for the students to acquire the knowledge on various vector borne disease and their outbreak.
- The students will learn about role of various insects in causal behaviour towards disease manifestation.
- The target learners will be able to understand the concept of disease outbreak, spread and epidemiology.

## Course Outcomes:

- Student will be able to understand the concepts of vector borne disease, vectors and host-vector relationship with specificity and their various modes of transmission.
- Target population will learn the types of insect vectors and disease caused by them.
- Students will be able to gain the knowledge on objectives and core functions of epidemiology.
- Students will gain the in-depth knowledge on epidemiological parameters like communicable and non-communicable disease and about their control measures.

## Learning Outcomes:

- Knowledge gain on principles and concepts of vector borne disease.
- Student will be well acquainted with the various types of vectors for causal and spread of disease.
- Learners will be able to disseminate the gained knowledge on epidemiological functions and significant role in public health management system.
- Students will be able to distinguish and initiate control measures towards various types of communicable and non-communicable diseases.

## Unit 1: Insects, Concept of Vectors, Insects as Vectors

General Features of Insects, Morphological features, Head – Eyes, Types of antennae, Mouth parts with reference to feeding habits, Brief introduction of Carrier and Vectors (mechanical and biological vector), Reservoirs, Host-vector relationship, Vectorial capacity, Adaptations as vectors, Host Specificity, Classification of insects up to orders, detailed features of orders with insects as vectors – Diptera, Siphonaptera, Siphunculata, Hemiptera.

## Unit 2: Vectors and diseases

Important insect vectors – Mosquitoes, Sandfly, Houseflies; Study of mosquito-borne diseases – Malaria, Dengue, Chikungunya, Viral encephalitis, Filariasis; Control of mosquitoes, Study of sand fly-borne diseases – Visceral Leishmaniasis, Cutaneous Leishmaniasis, Phlebotomus fever; Control of Sandfly, Study of house fly as important mechanical vector, Myiasis, Control of house fly

## Unit 3: Epidemiology-an introduction

Definition, Objective and uses and core functions of epidemiology, Epidemiologic approach, Historical evolution of epidemiology, Concept of health and disease, Determinants of health and diseases, Difference between epidemiology and clinical/preventive medicine, Epidemiology as the cornerstone of public health/health - for example: contribution of Nurses' Health study, British Doctors' study and Framingham

Heart Study to public health etc.

#### **Unit 4: Disease types, mode of transmission and management**

Difference between infectious and communicable diseases vs. non communicable diseases, Natural history of disease, Chain of infection, Mode and route of transmission of diseases, Meaning of outbreak or epidemic, endemic and pandemic, incubation period, latency period, clinical case, subclinical case, carrier, infectivity, pathogenicity and virulence, theories and principles of causation- epidemiological triad, web of causation, Bradford Hill criteria and Rothman's Causal pies, levels of prevention and modes of intervention.

#### **Text Books**

- ✓ Mathews, G. (2011). *Integrated Vector Management: Controlling Vectors of Malaria and Other Insect Vector Borne Diseases*. Wiley-Blackwell
- ✓ Chapman, R.F. (1998). *The Insects: Structure and Function*. IV Edition, Cambridge University Press, UK.

#### **Suggested Readings**

- ✓ Mike Service (2012) *Medical Entomology for Students* Cambridge University Press; 5th edition.
- ✓ Pedigo L.P. (2002). *Entomology and Pest Management*. Prentice Hall Publication
- ✓ *Understanding the fundamentals of Epidemiology- An evolving text*. Victor Schoenback and Wayne B. Rosamond (2000).
- ✓ *Modern Epidemiology*- Kenneth Rothman, Sebastien Haneuse, Timothy L. Lash, Tyler J. VanderWeele (2021).