

### Mandatory Courses (AUC)

Course Code	Course Name	Level	L	T	P	C	CIE	SEE	Total	Pre-requisite
2501AC01	Environmental Science	FC	2			0	100	-	100	-
2501AC02	Constitution of India	FC	2			0	100	-	100	-
2501AC03	Research Methodology	FC	2			0	100	-	100	-
2501AC04	Intellectual Property Rights & Patents	FC	2			0	100	-	100	-
2501AC05	Indian Knowledge Systems (IKS)	FC	2			0	100	-	100	-
<b>Total</b>			10			0				

**Environmental Science**  
(CE,EEE, ME, ECE,CSE, IT, AIML, CSE(DS), PT&Min.E)

**Course Code:2501AC01**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>

**Course Outcomes:**

**At the end of the course, student will be able to:**

- CO1** Outline the natural resources & their importance for the sustenance of the life
- CO2** Explain about the biodiversity of India, threats & its conservation methods
- CO3** Illustrate various attributes of the pollution, impacts & measures to control the pollution along with waste management practices
- CO4** Describe social issues of both rural & urban environment to combat the challenges & the legislations of India in environmental protection
- CO5** Explain the population growth & its implications
- CO6:** Summarize the Role of IT on Environment & Human Health

**Mapping of Course Outcomes with Program Outcomes:**

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11
<b>CO1</b>	1	-	-	-	-	3	2	-	-	-	-
<b>CO2</b>	-	1	-	-	-	-	2	3	-	-	-
<b>CO3</b>	-	-	-	-	-	2	3	-	-	-	-
<b>CO4</b>	-	-	-	-	-	2	3	1	-	-	-
<b>CO5</b>	-	-	-	-	-	2	3	-	-	-	-
<b>CO6:</b>	-	-	-	-	2	2	3	-	-	-	-

**UNIT – I**

**Multidisciplinary Nature of Environmental Studies:**

Definition, Scope & Importance, Need for Public Awareness.

Natural Resources: Renewable & non-renewable resources – Natural resources & associated problems.

**UNIT – II**

**Ecosystem, Biodiversity & Its Conservation:**

Ecosystems: Concept of an ecosystem. – Structure & function of an ecosystem – Producers, consumers, & decomposers. Food chains, food webs & ecological pyramids.

Biodiversity & Its Conservation: Definition: genetic, species & ecosystem diversity – Bio-geographical classification of India – Values of biodiversity. Hot-spots of biodiversity – Threats to biodiversity. Conservation of biodiversity: In-situ & Ex-situ conservation of biodiversity.

### **UNIT – III**

#### **Environmental Pollution & Solid Waste Management:**

Environmental Pollution: Definition, Cause, effects, & control measures of:

- a. Air Pollution.
- b. Water Pollution
- c. Soil Pollution
- d. Marine Pollution
- e. Noise Pollution

Solid Waste Management:

Causes, effects & control measures of urban & industrial wastes – Role of an individual in prevention of pollution

### **UNIT – IV**

#### **Social Issues & The Environment:**

Social Issues & the Environment: From Unsustainable to Sustainable development – Urban problems related to Energy & Water. Resettlement & rehabilitation of people, Environmental ethics, Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents, & holocaust. Environment Protection Act – Air (Prevention & Control of Pollution) Act. – Water (Prevention & control of Pollution) Act-Wildlife Protection Act – Forest Conservation Act – Issues involved in enforcement of environmental legislation – Public awareness.

### **UNIT – V**

**Human Population & The Environment:** Population growth, variation among nations. Environment & human health, Human Rights, Value Education. Role of Information Technology in Environment & human health.

#### **Text Books:**

1. Textbook of Environmental Studies for Undergraduate Courses, Erach Bharucha for University Grants Commission, Universities Press. ISBN: 9788173718625
2. Environmental Studies, Palaniswamy – Pearson education ISBN: 978-9332528277

#### **Reference Books:**

1. Textbook of Environmental Science, Deeksha Dave and E.Sai Baba Reddy, Cengage Publications. ISBN: 978-8131517604
2. Textbook of Environmental Sciences and Technology by M.Anji Reddy, B.S Publication. ISBN: 9385433385
3. Comprehensive Environmental studies by J.P.Sharma, Laxmi publications ISBN: 978-8170087380

#### **Web Links:**

- 1 <https://www.youtube.com/watch?v=mOwyPENHhbc>
- 2 [https://www.youtube.com/watch?v=\\_mgvsPnCYj4](https://www.youtube.com/watch?v=_mgvsPnCYj4)
- 3 <https://www.youtube.com/watch?v=L5B-JMnBIyQ>

**Constitution of India**  
(CE,EEE, ME, ECE,CSE, IT, AIML, CSE(DS), PT&Min.E)

	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>Course Code:2501AC02</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>

**Course Outcomes:**

**At the end of the course, student will be able to:**

- CO1** Explain historical background of the constitution making & its importance for building a democratic India
- CO2** Compare the functioning of three wings of the government i.e., executive, legislative & judiciary
- CO3** Interpret the value of the fundamental rights & duties for becoming good citizen of India
- CO4** Compare the decentralization of power between central, state & local self-government
- CO5** Extend the knowledge in strengthening of the constitutional institutions like CAG, Election Commission & UPSC for sustaining democracy.
- CO6:** Underst& the Electoral Process & Amendment procedure.

**Mapping of Course Outcomes with Program Outcomes:**

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11
<b>CO1</b>	-	-	-	-	-	3	2	1	-	-	-
<b>CO2</b>	-	-	-	-	-	2	3	1	-	-	-
<b>CO3</b>	-	-	-	-	-	3	3	2	-	-	-
<b>CO4</b>	-	-	-	-	-	3	1	2	-	-	-
<b>CO5</b>	-	-	-	-	-	2	3	1	-	-	-
<b>CO6:</b>	-	-	-	-	-	3	2	1	-	-	-

**UNIT – I**

**Introduction to Indian Constitution:**

Constitution’ meaning of the term, Indian Constitution - Sources & constitutional history, Features - Citizenship, Preamble, Fundamental Rights & Duties, Directive Principles of State Policy.

## **UNIT – II**

**Union Government & its Administration Structure of the Indian Union:** Federalism, Centre- State relationship, President: Role, power & position, PM & Council of ministers, Cabinet & Central Secretariat, Lok Sabha, Rajya Sabha, The Supreme Court & High Court: Powers & Functions

## **UNIT – III**

**State Government & its Administration:** Governor - Role & Position - CM & Council of ministers, State Secretariat: Organization, Structure & Functions.

## **UNIT – IV**

**Local Administration:** District's Administration Head - Role & Importance, Municipalities - Mayor & role of Elected Representative - CEO of Municipal Corporation .

**PanchayatiRaj:** Functions PRI: Zila Panchayat, Elected officials & their roles, CEO Zila Panchayat: Block level Organizational Hierarchy – (Different departments), Village level – Role of Elected & Appointed officials – Importance of grass root democracy.

## **UNIT – V**

**Election Commission:** Election Commission- Role of Chief Election Commissioner & Election Commissionerate State Election Commission:, Functions of Commissions for the welfare of SC/ST/OBC & women.

### **Text Books:**

1. Introduction to the Constitution of India, Durga Das Basu, Prentice – Hall of India Pvt. Ltd. New Delhi. ISBN: 978-9388548861
2. Indian Constitution, Subash Kashyap, National Book Trust. ISBN: 9788123707341

### **Reference Books:**

1. Dynamics of Indian Government & Politics, J.A. Siwach ISBN: 9788120709768
2. Indian Government and Politics, D.C. Gupta ISBN: 9780706987782
3. Constitutional Law of India , H.M.Sreevai, 4<sup>th</sup> edition in 3 volumes (Universal Law Publication). ISBN: 9788194776529

### **Web Links:**

- 1 [nptel.ac.in/courses/109104074/8](https://nptel.ac.in/courses/109104074/8)
- 2 [nptel.ac.in/courses/109104045/](https://nptel.ac.in/courses/109104045/)
- 3 [nptel.ac.in/courses/101104065/](https://nptel.ac.in/courses/101104065/)
- 4 [www.hss.iitb.ac.in/en/lecture-details](http://www.hss.iitb.ac.in/en/lecture-details)
- 5 [www.iitb.ac.in/en/event/2nd-lecture-institute-lecture-series-indian-constitution](http://www.iitb.ac.in/en/event/2nd-lecture-institute-lecture-series-indian-constitution)

**Research Methodology**  
(CE,EEE, ME, ECE,CSE, IT, AIML, CSE(DS), PT&Min.E)

<b>Course Code:2501AC03</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>

**Course Outcomes:**

**At the end of the course, student will be able to:**

- CO1** Explain the characteristics & process of research.
- CO2** Select the research problem by applying problem identification techniques.
- CO3** Formulate & execute research design process.
- CO4** Report the results of research process adhering to professional ethics.
- CO5** Analyze the results of research using statistical measures of central tendency
- CO6:** Analyze the results of research using coefficient of variation, correlation & regression

**Mapping of Course Outcomes with Program Outcomes:**

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11
<b>CO1</b>	1	-	-	2	-	-	-	-	-	2	1
<b>CO2</b>	1	-	-	2	-	-	-	-	-	2	1
<b>CO3</b>	1	-	-	2	-	-	-	-	-	2	1
<b>CO4</b>	1	-	-	2	-	-	-	3	-	2	1
<b>CO5</b>	1	-	-	2	2	-	-	-	-	2	1
<b>CO6:</b>	1	-	-	2	-	-	-	-	-	2	1

**UNIT – I**

**Meaning of Research:** Function of Research - Characteristics of Research – Steps involved in Research – Research in Pure & Applied Sciences - Inter Disciplinary Research. Factors which hinder Research – Significance of Research - Research & scientific methods – Research Process– Criteria of good Research – Problems encountered by Researchers – Literature review.

**UNIT – II**

**Identification of Research Problem :** Selecting the Research problem – Necessity of defining the problem – Goals & Criteria for identifying problems for research. Perception of Research problem – Techniques involved in defining the problem.

### **UNIT – III**

**Research Design :** Formulation of Research design – Need for Research design – Features of a good design – Important concepts related to Research design

### **UNIT – IV**

**Interpretation & Report Writing:** Meaning & Technique of interpretation – Precautions in interpretation – Significance of report writing – Different steps in writing a report – Layout of a Research report.

### **UNIT – V**

#### **Statistical Techniques & Tools :**

Introduction of statistics – Functions – Limitations – Measures of central tendency – Arithmetic mean – Median – Mode – Standard deviation – Co-efficient of variation (Discrete series & continuous series) – Correlation – Regression.

#### **Text Books:**

Research Methodology Methods & Techniques, C.R. Kothari – New Age international Publishers, Reprint. ISBN: 9788122515223

A Hand Book of Methodology of Research, Rajammall, P. Devadoss and K. Kulandaivel, RMM Vidyalaya press. ISBN: 9780367135720

#### **Reference Books:**

Thesis and Assignment Writing, J. Anderson, Wiley Eastern Ltd. ISBN: 978-8126530755

Research Methodology, Mukul Gupta, Deepa Gupta – PHI Learning Private Ltd., New Delhi. ISBN: 9788120349469

Fundamentals of Mathematical statistics, S.C. Gupta and V.K. Kapoor, Sultan Chand & Sons, New Delhi. ISBN: 978-8180545283

#### **Web Links:**

- 1 <https://nptel.ac.in/courses/127106227>
- 2 [https://www.youtube.com/watch?v=IZLn9\\_PA\\_4s](https://www.youtube.com/watch?v=IZLn9_PA_4s)

**Intellectual Property Rights & Patents**  
(CE,EEE, ME, ECE,CSE, IT, AIML, CSE(DS), PT&Min.E)

<b>Course Code: 2501AC04</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>

**Course Outcomes: At the end of the Course, Student will be able to:**

- CO1:** Compare various types of Intellectual Property rights.
- CO2:** Discuss Intellectual Property & infer rights on such Intellectual Property owners
- CO3:** Explain the process of patenting
- CO4:** Apply for Trade marks & Copyrights.
- CO5:** Explain the methods to protect Trade secrets
- CO6:** Interpret the legal issues on Intellectual Property Rights & cyber laws

**Mapping of Course Outcomes with Program Outcomes:**

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11
CO1	1	-	-	-	-	1	-	3	-	-	2
CO2	1	-	-	-	-	1	-	3	-	-	2
CO3	1	-	-	-	-	1	-	3	-	-	2
CO4	1	-	-	-	-	1	-	3	-	-	2
CO5	1	-	-	-	-	1	-	3	-	-	2
CO6	1	-	-	-	-	1	-	3	-	-	2

**UNIT – I**

**Introduction to Intellectual Property Rights (IPR):**

Concept of Property - Introduction to IPR – International Instruments & IPR - WIPO - TRIPS – WTO –Laws Relating to IPR - IPR Tool Kit - Protection & Regulation - Copyrights & Neighboring Rights – Industrial Property – Patents - Agencies for IPR Registration – Traditional Knowledge –Emerging Areas of IPR – Layout Designs & Integrated Circuits – Use & Misuse of Intellectual Property Rights.

**UNIT – II**

**Copyrights & Neighboring Rights:**

Introduction to Copyrights – Principles of Copyright Protection – Law Relating to Copyrights - Subject Matters of Copyright – Copyright Ownership – Transfer & Duration – Right to Prepare Derivative Works –Rights of Distribution – Rights of Performers – Copyright Registration – Limitations – Infringement of Copyright – Relief & Remedy – Case Law - Semiconductor Chip Protection Act.

### **UNIT – III**

#### **Patents:**

Introduction to Patents - Laws Relating to Patents in India – Patent Requirements – Product Patent & Process Patent - Patent Search - Patent Registration & Granting of Patent - Exclusive Rights – Limitations - Ownership & Transfer — Revocation of Patent – Patent Appellate Board - Infringement of Patent – Double Patenting — Patent Cooperation Treaty – New developments in Patents – Software Protection & Computer related Innovations.

### **UNIT – IV**

#### **Trademarks & Trade secrets:**

Introduction to Trademarks – Laws Relating to Trademarks – Functions of Trademark – Distinction between Trademark & Property Mark – Marks Covered under Trademark Law - Trade Mark Registration – Trade Mark Maintenance – Transfer of rights - Deceptive Similarities - Likelihood of Confusion - Dilution of Ownership – Trademarks Claims & Infringement – Remedies – Passing off Action - Introduction to Trade Secrets – General Principles - Maintaining Trade Secret – Physical Security – Employee Access Limitation – Employee Confidentiality Agreements.

### **UNIT – V**

#### **Cyber Law & Cyber Crime :**

Introduction to Cyber Law – Information Technology Act 2000 - Protection of Online & Computer Transactions - E-commerce - Data Security – Authentication & Confidentiality - Privacy - Digital Signatures – Certifying Authorities - Cyber Crimes - Prevention & Punishment – Liability of Network Providers. Relevant Cases Shall be dealt where ever necessary.

#### **Text Books:**

1. Fundamentals of IPR for Engineers- Kompal Bansal & Parishit Bansal, B. S. Publications (Press). ISBN: 9788178002774
2. Intellectual Property -Deborah E.Bouchoux, Third Edition, Cengage Learning, New Delhi. ISBN: 0 340 67786 4

#### **Reference Books:**

1. Intellectual property rights- Prabuddha Ganuli, Tata Mcgraw hill. ISBN: 978-0070077171
2. Intellectual property rights M.Ashok kumar and Mohd.Iqbal Ali:, Serials Publications  
ISBN: 9788183871648
3. Intellectual Property Rights (Patents & Cyber Law), Dr. A. Srinivas. Oxford University Press, New Delhi. ISBN: 979-8886848229
4. Intellectual Property- Richard Stim, Cengage Learning, New Delhi. ISBN: 978-0766826656

**Web Links:**

- 1 <http://www.wipo.int/portal/en/index.html>
- 2 <https://indiankanoon.org/>
- 3 <http://www.ipindia.nic.in/patents.htm>
- 4 <http://www.ipindia.nic.in/trade-marks.htm>
- 5 <http://copyright.gov.in>

**Indian Knowledge Systems (IKS)**  
(CE, EEE, ME, ECE, CSE, IT, AIML, CSE(DS), PT, Min. E)

<b>Course Code: 2501AC05</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>

**Course Outcomes:**

**At the end of the course, students will be able to:**

- CO1:** Describe the foundations and scope of Indian Knowledge Systems.
- CO2:** Recognize major Indian contributions to knowledge, science, and culture.
- CO3:** Appreciate ethical values and sustainability rooted in Indian traditions.
- CO4:** Relate traditional knowledge to contemporary societal and technological needs.

**Mapping of Course Outcomes with Program Outcomes:**

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11
<b>CO1</b>	-	-	-	-	-	3	1	1	-	-	-
<b>CO2</b>	-	-	-	-	-	3	1	1	-	-	-
<b>CO3</b>	-	-	-	-	-	3	1	1	-	-	-
<b>CO4</b>	-	-	-	-	-	3	1	1	-	-	-
<b>CO5</b>	-	-	-	-	-	3	1	1	-	-	-

**UNIT – I**

**Foundations of Indian Knowledge Systems**

Meaning, scope, and importance of IKS. Sources of IKS: Vedas, Upanishads, Itihasas, Puranas, Shastras. Traditional Knowledge, Indigenous Knowledge, and Western Knowledge – comparison. Gurukula system and knowledge transmission traditions

**UNIT – II**

**Indian Civilization and Philosophical Traditions**

Overview of ancient Indian civilization (Indus Valley, Maurya, Gupta). Indian philosophical schools and ethical values. Epics: Ramayana and Mahabharata – cultural and moral significance. Religious traditions: Hinduism, Buddhism, Jainism, Sikhism

**UNIT – III**

**Arts, Architecture and Cultural Expressions**

Temple architecture: Nagara, Dravidian, Vesara. Mughal architecture and monuments. Indian classical dance forms and music traditions. Handicrafts, sculpture, painting, and iconography

**UNIT – IV**

**Traditional Knowledge in Health, Environment and Sustainability**

Ayurveda and Yoga – holistic health systems. Traditional agriculture and food practices. Water conservation methods and environmental ethics. Biodiversity conservation and sustainable living

## **UNIT – V**

### **Traditional Knowledge and Contemporary Relevance**

Protection of Traditional Knowledge. Traditional Knowledge (TK) and Intellectual Property Rights (overview). Role of government and national initiatives. Relevance of IKS to engineering, innovation, and entrepreneurship

#### **Text Books:**

1. **Indian Knowledge Systems**, Kapil Kapoor & Avadhesh Kumar Singh, D.K. Printworld (India) Pvt. Ltd., New Delhi. ISBN: 9788124608177.
2. **Indian Philosophy – Volume I & II**, S. Radhakrishnan, Oxford University Press, New Delhi. ISBN: 9780195698418.
3. **Science and Technology in Ancient India**, O.P. Jaggi, Atma Ram & Sons, Delhi. ISBN: 9788185694085.
4. **Indian Heritage and Culture**, Madhukar K. Bhagat, McGraw Hill Education (India). ISBN: 9789332901476.
5. **Traditional Knowledge System in India**, Yogendra K. Malik, Pearson Education India. ISBN: 9788131762219.

#### **Reference Books:**

1. **Ancient Indian Science and Technology**, Debiprasad Chattopadhyaya, History of Science, Philosophy and Culture in Indian Civilization Series. ISBN: 9788187586098.
2. **Indian Culture and Heritage**, Nitin Singhania, McGraw Hill Education. ISBN: 9789353161132.
3. **Knowledge Traditions of India**, Bhu Dev Sharma, Indian Council of Philosophical Research (ICPR). ISBN: 9788185636306.

#### **Web Links:**

1. <https://iks.aicte-india.org/>
2. <https://www.education.gov.in/iks>