**Army Institute Of Technology (AIT),** Dighi Camp, Pune - 15.
Director : 7249250115, Joint Director : 7249250117, Principal : 7249250186
Exch : 7249250183, 7249250184, 7249250185
Website : www.aitpune.com  Email : ait@aitpune.edu.in
Recognised by AICTE and DTE Maharashtra and affiliated to Savitrabai Phule Pune University

ONWARD TO GLORY

## Key Indicator- 1.3 Curriculum Enrichment

### 1.3.1 Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability into the Curriculum

| Sr. No. | Core courses relevant to | Name of the Course | Class | Page No |
|---|---|---|---|---|
| 1 | Professional Ethics | **Mech**<br>a. Developing soft skills and personality<br>b. Business Ethics | **Mech**<br>a. SE Mech (Sem I)<br>b. SE Mech (Sem II) | **2**<br>2-3<br>2-3 |
| | | **Comp**<br>a. Professional Ethics and Etiquette | **Comp**<br>a. TE Comp (Sem I) | 4 |
| | | **IT**<br>a. Ethics and Values in Information Technology | **IT**<br>a. BE IT (Sem I) | 5 |
| | | **ASGE**<br>a. Importance of Soft skills- FE Induction Program 2022-23 | **ASGE**<br>a. FE All | 6 |
| | | **Plagiarism Report Sample** | | 7 |
| 2. | Gender | **ASGE**<br>**a.** Gender Sensitization- FE Induction Program 2022-23<br>**b.** ICC Committee Details | **ASGE**<br>a. FE All | **8**<br>8<br><br>9-10 |
| 3. | Human Values | **Mech**<br>a. Human Behaviour<br>b. Yoga Practices<br>c. Stress Management | **Mech**<br>a. SE Mech (Sem II)<br>b. BE Mech (Sem I)<br>c. BE Mech (Sem I) | **11**<br>11<br>12<br>12 |
| | | **Comp**<br>a. Stress Relief: Yoga and Meditation | **Comp**<br>a. SE Comp (Sem I) | 13 |
| | | **IT**<br>a. Stress Management by Yoga | **IT**<br>a. BE IT (Sem I) | 14 |
| | | **ASGE**<br>a. Universal Human Values-FE Induction Program 2022-23<br>b. Democracy, Election and Governance | **ASGE**<br>a. FE All<br><br>b. FE All | 15<br><br><br>16 |
| 4. | Environment and Sustainability | **ENTC**<br>a. Ecology & Environment<br>b. Environment and Development | **ENTC**<br>a. SE E&TC (Sem I)<br>b. TE E&TC (Sem I) | **17**<br>17<br>18 |
| | | **Comp**<br>a. Sustainable Energy Systems<br>b. Environmental Studies | **Comp**<br>a. TE Comp (Sem II)<br>b. SE comp (Sem I) | 19<br>20 |
| | | **IT**<br>a. E-Waste Management and Pollution Control<br>b. Green and Unconventional Energy | **IT**<br>a. SE IT (Sem II)<br>b. TE IT (Sem II) | 21<br>22 |
| | | **ASGE**<br>a. Environmental Studies-I<br>b. Environmental Studies- II | **ASGE**<br>a. FE All (Sem I)<br>b. FE All (Sem II) | 23<br>24 |

**Criterion 1 – Curricular Aspects          1.3.1**

# 1. PROFESSIONAL  ETHICS

## A.  DEPARTMENT OF  MECHANICL  ENGINEERING

**Savitribai Phule Pune University**
**Board of Studies - Automobile and Mechanical Engineering**
**Undergraduate Program - Automobile Engineering & Mechanical Engineering (2019 pattern)**

| Course Code | Course Name | Teaching Scheme (Hours/Week) | | | Examination Scheme and Marks | | | | | | Credit | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | TH | PR | TUT | ISE | ESE | TW | PR | OR | TOTAL | TH | PR | TUT | TOTAL |
| | **Semester-III** | | | | | | | | | | | | | |
| 202041 | Solid Mechanics | 4 | 2 | - | 30 | 70 | - | 50 | - | 150 | 4 | 1 | - | 5 |
| 202042 | Solid Modeling and Drafting | 3 | 2 | - | 30 | 70 | - | 50 | - | 150 | 3 | 1 | - | 4 |
| 202043 | Engineering Thermodynamics | 3 | 2 | - | 30 | 70 | - | - | 25 | 125 | 3 | 1 | - | 4 |
| 202044 | Engineering Materials and Metallurgy | 3 | 2 | - | 30 | 70 | 25 | - | - | 125 | 3 | 1 | - | 4 |
| 203156 | Electrical and Electronics Engineering | 3 | 2 | - | 30 | 70 | 25 | - | - | 125 | 3 | 1 | - | 4 |
| 202045 | Geometric Dimensioning and Tolerancing Lab | - | 2 | - | - | - | 25 | - | - | 25 | - | 1 | - | 1 |
| 202046 | Audit Course - III | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | **Total** | 16 | 12 | - | 150 | 350 | 75 | 100 | 25 | 700 | 16 | 6 | - | 22 |
| | | | | | | | | | | | | | | |
| | **Semester-IV** | | | | | | | | | | | | | |
| 207002 | Engineering Mathematics - III | 3 | - | 1 | 30 | 70 | 25 | - | - | 125 | 3 | - | 1 | 4 |
| 202047 | Kinematics of Machinery | 3 | 2 | - | 30 | 70 | - | - | 25 | 125 | 3 | 1 | - | 4 |
| 202048 | Applied Thermodynamics | 3 | 2 | - | 30 | 70 | - | - | 25 | 125 | 3 | 1 | - | 4 |
| 202049 | Fluid Mechanics | 3 | 2 | - | 30 | 70 | - | - | 25 | 125 | 3 | 1 | - | 4 |
| 202050 | Manufacturing Processes | 3 | - | - | 30 | 70 | - | - | - | 100 | 3 | - | - | 3 |
| 202051 | Machine Shop | - | 2 | - | - | - | 50 | - | - | 50 | - | 1 | - | 1 |
| 202052 | Project Based Learning - II | - | 4 | - | - | - | 50 | - | - | 50 | - | 2 | - | 2 |
| 202053 | Audit Course - IV | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | **Total** | 15 | 12 | 1 | 150 | 350 | 125 | - | 75 | 700 | 15 | 6 | 1 | 22 |
| | **Abbreviations: TH:** Theory, **PR:** Practical, **TUT:** Tutorial, **ISE:** In-Semester Exam, **ESE:** End-Semester Exam,**TW:** Term Work, **OR:** Oral | | | | | | | | | | | | | |
| | **Note:** Interested students of SE (Automobile Engineering and Mechanical Engineering) can opt for any one of the audit course from the list of audit courses prescribed by BoS (Automobile and Mechanical Engineering) | | | | | | | | | | | | | |

| 202046 - Audit Course - III | | |
|---|---|---|
| **Teaching Scheme** | **Credits** | **Examination Scheme** |
| - | - | - |

## GUIDELINES FOR CONDUCTION OF AUDIT COURSE

**Faculty mentor shall be allotted for individual courses and he/she shall monitor the progress for successful accomplishment of the course. Such monitoring is necessary for ensuring that the concept of self learning is being pursued by the students 'in true letter and spirit'.**

- If any course through Swayam/ NPTEL/ virtual platform is selected the minimum duration shall be of 8 weeks.
- However if any of the course duration is less than the desired (8 weeks) the mentor shall ensure that other activities in form of assignments, quizzes, group discussion etc. (allied with the course) for the balance duration should be undertaken.

In addition to credits courses, it is mandatory that there should be an audit course (non-credit course) from second year of Engineering. The student will be awarded grade as AP on successful completion of the audit course. The student may opt for any one of the audit courses in each semester. Such audit courses can help the student to get awareness of different issues which make an impact on human lives and enhance their skill sets to improve their employability. List of audit courses offered in the semester is provided in the curriculum. Students can choose one of the audit courses from the list of courses mentioned. Evaluation of the audit course will be done at institute level.

The student registered for audit course shall be awarded the grade AP and shall be included such grade in the Semester grade report for that course, provided student has the minimum attendance as prescribed by the Savitribai Phule Pune University and satisfactory in-semester performance and secured a passing grade in that audit course. No grade points are associated with this 'AP' grade and performance in these courses is not considered in the calculation of the performance indices SGPA and CGPA. Evaluation of the audit course will be done at institute level itself.

| **Selecting an Audit Course** |
|---|
| **List of Courses to be opted (Any one) under Audit Course III** |

- Technical English For Engineers
- Entrepreneurship Development
- Developing soft skills and personality
- Design Thinking
- Foreign Language (preferably German/ Japanese)

| **Selecting an Audit Course** |
|---|
| **List of Courses to be opted (Any one) under Audit Course IV** |

- Language & Mind Emotional Intelligence
- Advanced Foreign Language (preferably German/ Japanese)
- Human Behaviour
- Speaking Effectively
- Business Ethics
- Technical writing/ Research writing

# The titles indicated above are subject to change in time to come and such an alteration (if any) should be brought to the notice of the BoS.

**Using NPTEL Platform: (preferable)**

NPTEL is an initiative by MHRD to enhance learning effectiveness in the field of technical

## B. DEPARTMENT OF COMPUTER ENGINEERING

### AC5-II: Professional Ethics and Etiquettes

**Prerequisites:** Business Communication Skill

**Course Objectives:**

- To learn importance of ethics and the rules of good behavior for today's most common social and business situations
- To acquire basic knowledge of ethics to make informed ethical decisions when confronted with problems in the working environment
- To develop an understanding towards business etiquettes and the proper etiquette practices for different business scenarios
- To learn the etiquette requirements for meetings, entertaining, telephone, email and Internet business interaction scenario

**Course Outcomes:**

On completion of the course, learners will be able to

**CO1:** Summarize the principles of proper courtesy as they are practiced in the workplace

**CO2:** Apply proper courtesy in different professional situations

**CO3:** Practice and apply appropriate etiquettes in the working environment and day to day life

**CO4:** Build proper practices personal and business communications of Ethics and Etiquettes

### Course Contents

1. **Introduction to Ethics**: Basics, Difference Between Morals, Ethics, and Laws, Engineering Ethics: Purpose of Engineering Ethics-Professional and Professionalism, Professional Roles to be played by an Engineer, Uses of Ethical Theories, Professional Ethics, Development of Ethics.

2. **Professional Ethics:** IT Professional Ethics, Ethics in the Business World, Corporate Social Responsibility, Improving Corporate Ethics, Creating an Ethical Work Environment, Including Ethical Considerations in Decision Making, Ethics in Information Technology, Common Ethical issues for IT Users, Supporting the Ethical Practices of IT users.

3. **Business Etiquette**: ABC's of Etiquette, Developing a Culture of Excellence, The Role of Good Manners in Business, Enduring Words Making Introductions and Greeting People: Greeting Components, The Protocol of Shaking Hands, Introductions, Introductory Scenarios, Addressing Individuals Meeting and Board Room Protocol: Guidelines for Planning a Meeting, Guidelines for Attending a Meeting.

4. **Professional Etiquette**: Etiquette at Dining, Involuntary Awkward Actions, How to Network, Networking Etiquette, Public Relations Office(PRO)'s Etiquettes, Technology Etiquette : Phone Etiquette, Email Etiquette, Social Media Etiquette, Video Conferencing Etiquette, interview Etiquette, Dressing Etiquettes : for interview, offices and social functions.

## C. DEPARTMENT OF INFORMATION TECHNOLOGY

<table>
<tr><td colspan="3" align="center">Savitribai Phule Pune University, Pune</td></tr>
<tr><td colspan="3" align="center">Second Year Information Technology (2019 Course)</td></tr>
<tr><td colspan="3" align="center">214450 ( A ): Mandatory Audit Course 3:</td></tr>
<tr><td colspan="3" align="center">Ethics and Values in Information Technology</td></tr>
<tr><td>Teaching Scheme:</td><td>Credit Scheme:</td><td>Examination Scheme:</td></tr>
<tr><td>01hrs/week</td><td>Non Credit</td><td>Audit Course</td></tr>
</table>

**Prerequisite Courses, if any:--**

**Course Objectives:**
1. To understand and implement the values and principles in the field of Information Technology.
2. To nurture honest and responsible professionals in Information Technology.
3. To develop student's understanding about social/ professional ethical issues related to Information Technology.
4. To inculcate professional ethics in the field of IT.

**Course Outcomes:**

On completion of this course students will be able to-

CO1: Adapt the global ethical principles and modern ethical issues.

CO2: Apprehend ethics in the business relationships and practices of IT.

CO3: Implement trustworthy computing to manage risk and security vulnerabilities.

CO4: Analyse concerns of privacy, privacy rights in information-gathering practices in IT.

<table>
<tr><td colspan="3" align="center"><strong>COURSE CONTENTS</strong></td></tr>
<tr><td align="center"><strong>Unit -I</strong></td><td align="center"><strong>An Overview of Ethics</strong></td><td align="center"><strong>03hrs</strong></td></tr>
</table>

**An overview of Ethics:** Brief about ethics, Ethics in the Business World, Ethics in IT.

**Ethics for IT professionals and IT users: IT professionals:** Changing Professional Services, Professional Relationships, Codes of Ethics, awareness of IT malpractices, **IT Users:** Common Ethical Issues for IT Users, Supporting the Ethical Practices of IT Users.

<table>
<tr><td>Mapping of Course Outcomes for Unit I</td><td>CO1 , CO2</td></tr>
<tr><td align="center"><strong>Unit- II</strong></td><td align="center"><strong>Computer And Internet Crime</strong></td><td align="center"><strong>03hrs</strong></td></tr>
</table>

**Introduction:** IT security incidents, Types of Exploits, Types of Perpetrators, Laws for Prosecuting Computer Attacks, Implementing Trustworthy Computing, Risk and Vulnerability Assessment, Educating Employees, Contractors, and Part-Time Workers, Establishing a Security Policy

**Privacy:** The right of Privacy, Privacy Protection and the Law, Key Privacy and Anonymity Issues Identity Theft, Consumer Profiling, Treating Consumer Data Responsibly, Workplace Monitoring

**Freedom of Expression:** Defamation and Hate Speech, Key Issues, Controlling Access to Information on the Internet, Anonymity on the Internet, Corporate Blogging, Pornography

<table>
<tr><td>Mapping of Course Outcomes for Unit II</td><td>CO3, CO4</td></tr>
</table>

**D. DEPARTMENT OF APPLIED SCIENCE AND GENERAL ENGINEERING**

**ARMY INSTITUTE OF TECHNOLOGY**
**FE Induction Program 2022-23**
**WEEK 2: 10th to 14th October 2022**

**Day 5: Friday 14th October 2022**

Day 05 Faculty In charge: Dr Sonali Bhosale

| Time | Class | Activity | Venue | Resource Persons | Faculty Reps | Support Staff / PA System |
|---|---|---|---|---|---|---|
| 6:30am -7:30am | FE All | Physical Activity/Yoga /Meditation/Sports | Football court | Prof Vishal Pardeshi | All Hostel Wardens& Sport Club Secretaries | — |
| 7:30am -9:00am | | | | Breakfast– Respective Hostel | | |
| 9:15am-11:00am | FE COMP A | Joint Sensitization | LH 14 | Class Teacher, Counselors & SE Mentors | Prof M Chandola | Mrs Manisha Taru Mrs Varsha Sadawarte Mrs Varsha Kulkarni Mr Raghu Babar |
| | FE COMP B | | Raman Theater | | | |
| | FE E&TC A | | Manekshaw Hall | | | |
| | FE E&TC B | Counseling, Mentor Allotment & Visit to Library | LH 05 | Class Teacher, Counselors & SE Mentors | | |
| | FE IT | | LH 06 | | | |
| | FE MECH | | LH 13 | | | |
| 11:00am-11:15am | | | | Short Break | | |
| 11:15am-12:00pm | FE All | Paper Writing | Manekshaw hall | Dr P B Karandikar | Prof Anita Suryawanshi Prof Rushikesh Patil | Mrs Varsha Sadawarte Mrs Varsha Kulkarni |
| 12:00 pm-2:00pm | | | | Lunch Break | | |
| 2:00pm-3:00pm | FE COMP A | Fine Art | LH 05 | Staff members & student reps of Board | Dr A K Singh Dr Ganesh Mundhe Prof Surkha Gite | Mrs Varsha Sadawarte Mrs Varsha Kulkarni |
| | FE COMP B | | LH 06 | | | |
| | FE E&TC A | | LH 13 | | | |
| | FE E&TC B | | LH 14 | | | |
| | FE IT | | Drawing Hall | | | |
| | FE MECH | | Manekshaw Hall | | | |
| 3:00pm-4:00pm | FE All | Importance of Soft skills | Manekshaw hall | Prof Nithya Basker | Prof Sachin Tanwade Prof Vitthal Hivrale | Mr Raghu Babar Mrs Swati Kulkarni |

H. U. D.
Applied Science Dep

6

# ANNEXURE E: PLAGIARISM REPORT

## IoT Based Health Monitoring System

ORIGINALITY REPORT

| 16% | 13% | 5% | 5% |
|---|---|---|---|
| SIMILARITY INDEX | INTERNET SOURCES | PUBLICATIONS | STUDENT PAPERS |

PRIMARY SOURCES

| 1 | Tuan Nguyen Gia, Amir-Mohammad Rahmani, Tomi Westerlund, Pasi Liljeberg, Hannu Tenhunen. "Fault tolerant and scalable IoT-based architecture for health monitoring", 2015 IEEE Sensors Applications Symposium (SAS), 2015<br>Publication | 3% |
|---|---|---|
| 2 | ar.kalasalingam.ac.in<br>Internet Source | 2% |
| 3 | components101.com<br>Internet Source | 2% |
| 4 | arduinolearning.com<br>Internet Source | 2% |
| 5 | www.iotforall.com<br>Internet Source | 2% |
| 6 | www.educative.io<br>Internet Source | 2% |
| 7 | gitlab.sliit.lk<br>Internet Source | 2% |

AIT 2021-22

# 2. GENDER

## A. DEPARTMENT OF APPLIED SCIENCE AND GENERAL ENGINEERING

### Day 2: Tuesday 4rd October 2022

**Day 02 Faculty In charge: Dr A K Singh**

| Time | Class | Activity | Venue | Resource Persons | Faculty Rep | Support Staff / PA System |
|------|-------|----------|-------|------------------|-------------|----------------------------|
| 6:30am -7:30am | FE All | Physical Activity / Yoga / Meditation/ Sports | Football court | Prof Vishal Pardeshi | All Hostel Wardens & Sport Club Secretaries | — |
| 7:30am-9:15am | FE All | Breakfast– Respective Hostel | | | | |
| 9:30am -10:30am | FE All | Central Address | Manekshaw Hall | Director Sir | Prof Anita Suryawanshi<br>Prof Mahima Jain<br>Prof Vitthal Hivrale<br>Prof Surekha Gite | Mrs Swati Salunkhe<br>Mr Raghu Babar |
| 10:30am-12:00pm | FE All | Embracing Challenges | Manekshaw Hall | Comdr Konkar | Dr Nidhi Yadav<br>Prof Anita Suryawanshi<br>Prof Sachin Tanwade<br>Prof Supriya Kalamkar | Mrs Swati Salunkhe<br>Mr Raghu Babar |
| 12:00pm-3:00pm | | Lunch Break – Respective Hostel | | | | |
| 3:00pm -4:00pm | FE All | Gender Sensitization | Manekshaw Hall | Adv Sayali Ganu | Dr Preeti Purohit<br>Dr Seema Tiwari<br>Dr Sonali Bhosale<br>Prof Sachin Tanwade<br>Other Staff of ICC | Mrs Varsha Sadawarte<br>Mrs Varsha Kulkarni |
| 4:00pm -5:00pm | FE All | Rule Book Explanation | Manekshaw Hall | Student President , General Secretary, Lady Representative | Prof Vitthal Hivrale<br>Prof Sachin Tanwade<br>Prof Anita Suryawanshi<br>Dr Ganesh Mundhe | Mrs Varsha Sadawarte<br>Mrs Varsha Kulkarni |

H. O. D.
Applied Science Dep'

# ARMY INSTITUTE OF TECHNOLOGY

*ONWARD TO GLORY*

## INTERNAL COMPLAINT COMMITTEE
## SEXUAL HARASSMENT AT WORKPLACE

**Prof (Dr). Pritee Purohit, Chairperson**
Prof. Vijay Kumar Karra, E&TC
Prof .Vaishali Ingale, Teaching Rep
Mrs. Rajashree C, Non-Teaching Rep
Mrs. Manisha Taru, Student Section
Lady Representative, Student Council
Dr. Sayali Ganu, External Member

GPS Map Camera

Pimpri-Chinchwad, Maharashtra, India
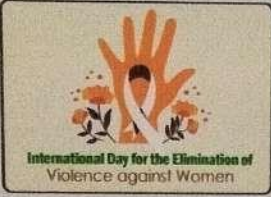Unnamed Road, Dighi, Pimpri-Chinchwad, Maharashtra 411015, India
Lat 18.607029°
Long 73.875146°
05/08/24 04:10 PM GMT +05:30

**Mechanical Store**

# ARMY INSTITUTE OF TECHNOLOGY

**International Day for the Elimination of Violence against Women**

**Section 354A: Sexual harassment and punishment for sexual harassment.**

(1) A man committing any of the following acts-

 (I) physical contact and advances involving unwelcome and explicit sexual overtures; or

 (ii) a demand or request for sexual favours; or

 (iii) showing pornography against the will of a woman; or

 (iv) making sexually coloured remarks, shall be guilty of the offence of sexual harassment.

(2) Any man who commits the offence specified in clause
 (i) or clause (ii) or clause (iii) of sub-section

Any man who commits the offence specified in clause (i) or clause (ii) or clause (iii) of sub-section shall be punished with **rigorous imprisonment** for a term which may extend to **three years**, or with fine, or with both.

(3) Any man who commits the offence specified in clause (iv) of sub-section (1) shall be punished with imprisonment of either description for a term which may extend to **one year**, or with fine, or with both.

**ICC is sharing buddy cop's number herewith for all ladies staff and girl students. In case of for any unwelcome behavior you can contact your buddy cop directly.**

**Internal Complaints Committee:**

Dr Pritee Purohit: 9145231814

Prof. Vijay Kumar Karra: 9823256569

Prof. Vaishali Ingale: 9371165218

Sub Inspector Shubhangi Magdum
**7709616389**

**25th November 2022 International Day for the Elimination of Violence against Women**

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# 3. HUMAN VALUES

## A. DEPARTMENT OF MECHANICAL ENGINEERING

| 202053 - Audit Course - IV | | |
|---|---|---|
| **Teaching Scheme** | **Credits** | **Examination Scheme** |
| - | - | - |
| **GUIDELINES FOR CONDUCTION OF AUDIT COURSE** | | |

**Faculty mentor shall be allotted for individual courses and he/she shall monitor the progress for successful accomplishment of the course. Such monitoring is necessary for ensuring that the concept of self learning is being pursued by the students 'in true letter and spirit'.**

- If any course through Swayam/ NPTEL/ virtual platform is selected the minimum duration shall be of 8 weeks.
- However if any of the course duration is less than the desired (8 weeks) the mentor shall ensure that other activities in form of assignments, quizzes, group discussion etc. (allied with the course) for the balance duration should be undertaken.

In addition to credits courses, it is mandatory that there should be an audit course (non-credit course) from second year of Engineering. The student will be awarded grade as AP on successful completion of the audit course. The student may opt for any one of the audit courses in each semester. Such audit courses can help the student to get awareness of different issues which make an impact on human lives and enhance their skill sets to improve their employability. List of audit courses offered in the semester is provided in the curriculum. Students can choose one of the audit courses from the list of courses mentioned. Evaluation of the audit course will be done at institute level.

The student registered for audit course shall be awarded the grade AP and shall be included such grade in the Semester grade report for that course, provided student has the minimum attendance as prescribed by the Savitribai Phule Pune University and satisfactory in-semester performance and secured a passing grade in that audit course. No grade points are associated with this 'AP' grade and performance in these courses is not considered in the calculation of the performance indices SGPA and CGPA. Evaluation of the audit course will be done at institute level itself.

| Selecting an Audit Course |
|---|
| **List of Courses to be opted (Any one) under Audit Course IV** |

- Language & Mind Emotional Intelligence
- Advanced Foreign Language (preferably German/ Japanese)
- Human Behaviour
- Speaking Effectively
- Business Ethics
- Technical writing/ Research writing

# The titles indicated above are subject to change in time to come and such an alteration (if any) should be brought to the notice of the BoS.

| Audit Courses | | | |
|---|---|---|---|
| 402054A | Yoga Practices | 402054B | Stress Management |
| 402055A | Managing Innovation | 402055B | Operations Management |

| List of Courses to be opted (Any one) under Audit Course |
|---|
| A. Yoga Practices<br>B. Stress Management<br>Note:-The title indicated above are subject to change in time to come and such an alteration (if any) should be brought to the notice of the BoS. |
| **Using NPTEL Platform: (preferable)** |
| NPTEL is an initiative by MHRD to enhance learning effectiveness in the field of technical education by developing curriculum based video courses and web based e-courses. The details of NPTEL courses are available on its official website www.nptel.ac.in<br><br>• Students can select any one of the courses mentioned above and has to register for the corresponding online course available on the NPTEL platform as an Audit course.<br><br>• Once the course is completed the student can appear for the examination as per the guidelines on the NPTEL portal.<br><br>• After clearing the examination successfully; student will be awarded with a certificate. |
| **Assessment of an Audit Course** |
| • The assessment of the course will be done at the institute level. The institute has to maintain the record of the various audit courses opted by the students. The audit course opted by the students could be interdisciplinary<br>• During the course students will be submitting the online assignments/report/course completion certificate etc. A copy of the same can be submitted as a part of term work for the corresponding Audit course.<br>• On the satisfactory submission of assignments/report/course completion certificate etc., the institute can mark as "Present" and the student will be awarded the grade AP on the mark-sheet. |

## B. DEPARTMENT OF COMPUTER ENGINEERING

### AC4-IV: Yoga and Meditation

The concepts and practices of Yoga originated in India about several thousand years ago. Its founders were great Saints and Sages. The great Yogis presented rational interpretation of their experiences of Yoga and brought about a practical and scientifically sound method within every one's reach. Yoga today, is no longer restricted to hermits, saints, and sages; it has entered into our everyday lives and has aroused a worldwide awakening and acceptance in the last few decades. The science of Yoga and its techniques have now been reoriented to suit modern sociological needs and lifestyles.

Yoga is one of the six systems of Vedic philosophy. The Yoga advocates certain restraints and observances, physical discipline, breathe regulations, restraining the sense organs, contemplation, meditation and Samadhi. The practice of Yoga prevents psychosomatic disorders and improves an individual's resistance and ability to endure stressful situations.

**Course Objectives:**

- To impart knowledge about the basic technique and practice of yoga, including instruction in breath control, meditation, and physical postures
- To gain an intellectual and theoretical understanding of the principles embodied in the Yoga Sutras, the Bhagavad-Gita, and other important texts and doctrines
- Relaxation and stress reduction ,Personal insight and self understanding, Personal empowerment, Gaining wisdom and spiritual discernment
- Awakening the abilities or powers of the Super conscious mind

**Course Outcomes:**

On completion of the course, learner will be able to–

**CO1: Understand** philosophy and religion as well as daily life issues will be challenged and enhanced.

**CO2: Enhances** the immune system.

**CO3:** Intellectual and philosophical understanding of the theory of yoga and basic related Hindu scriptures will be developed.

**CO4:** Powers of concentration, focus, and awareness will be heightened.

### Course Contents

1. Meaning and definition of yoga – Scope of Yoga - Aims and Objectives of Yoga – Misconception about yoga.
2. Ayurveda: an introduction to this system of health care derived from the Vedic tradition Anatomy and Physiology as they relate to Yoga
3. Yoga Philosophy and Psychology

**References:**

1. B.K.S. Iyengar, "BKS Iyengar Yoga The Path to Holistic Health" , DK publisher, ISBN-13: 978-1409343479
2. Osho, "The Essence of Yoga", Osho International Foundation, ISBN: 9780918963093

#### @The CO-PO Mapping Matrix

| CO\PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1 | 1 | 1 | - | - | - | 2 | - | - | 2 | - | - | - |
| CO2 | - | - | - | - | - | 2 | 1 | - | - | - | - | - |
| CO3 | - | 2 | - | - | - | 2 | - | - | - | - | - | - |
| CO4 | - | 2 | - | - | - | - | - | 2 | - | - | - | - |

## C.  DEPARTMENT OF INFORMATION TECHNOLOGY

| Savitribai Phule Pune University, Pune | | |
|---|---|---|
| B.E Information Technology (2019 Course) | | |
| 414449B: Audit Course 7 | | |
| Stress Management By Yoga | | |
| **Teaching Scheme:** | **Credit Scheme:** | **Examination Scheme:** |
| Theory(TH): 01 hrs/week | Non-Credit | Audit Course |
| **Prerequisite Courses, if any:** | | |
| **Course Objectives:** | | |
| To achieve overall health of body and mind | | |
| **Course Outcomes:** | | |
| On completion of the course, students will be able to– <br> **CO1.** Understand the reasons for Stress. <br> **CO2.** Understand the role of Yoga. <br> **CO3.** Develop healthy mind in a healthy body. <br> **CO4.** Develop overall efficiency. | | |
| **COURSE CONTENTS** | | |
| **Unit I** | **Introduction to Stress** | **(03 hrs)** |
| Meaning and Definition of Stress. Types: Eutress, Distress, Anticipatory Anxiety, Intense Anxiety and Depression. Meaning of Management – Stress Management. Physiology of Stress on: Autonomic Nervous System. | | |
| **Mapping of Course Outcomes for Unit I** | CO1 | |
| **Unit II** | **Introduction to Yoga** | **(03 hrs)** |
| Meaning and definition of Yoga – aims & objectives of yoga, Definitions of Eight parts of yog. (Ashtanga), Concept of Stress according to Yoga. | | |
| **Mapping of Course Outcomes for Unit II** | CO2 | |
| **Unit III** | **Asan and Pranayam** | **(03 hrs)** |
| Asan - Various yog poses and their benefits for mind & body. <br> Pranayam - Regularization of breathing techniques and its effects-Types of pranayam. | | |
| **Mapping of Course Outcomes for Unit III** | CO3 | |
| **Unit IV** | **Effect of Yoga** | **(03 hrs)** |
| Impact of Yoga on Muscular system, Respiratory System, Circulatory system, Nervous system, Digestive system and Endocrine system | | |
| **Mapping of Course Outcomes for Unit IV** | CO4 | |

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# D. DEPARTMENT OF APPLIED SCIENCE AND GENERAL ENGINEERING

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**ARMY INSTITUTE OF TECHNOLOGY**
**FE Induction Program 2022-23**
**WEEK 3: Day 1**

**Friday 28th October 2022**

**Day 01 Faculty In charge: Dr A K Singh**

| Time | Class | Activity | Venue | Resource Persons | Faculty Reps | Support Staff / PA System |
|------|-------|----------|-------|------------------|--------------|---------------------------|
| 10:00am-11:30am | | Universal Human Values | Manekshaw Hall | Mr Amol Phalke | Dr Seema Tiwari | Mrs Varsha Sadawarte |
| 11:30am-1:00pm | FE All | Avenues & Preparation for Technical Graduates in Armed Forces | | Brig (Dr) Sunil Bodhe | Prof Anita Suryawanshi | Mrs Varsha Kulkarni Mrs Manisha Taru |
| 1:00 pm-3:00pm | | | | Lunch Break | | |
| 3:00pm-3.30pm | FE All | R & D Cell | Manekshaw Hall | Staff members & student reps of respective cell | Dr Nidhi Yadav | Mrs Varsha Sadawarte Mrs Varsha Kulkarni Mrs Manisha Taru |
| 3:30pm-4:30pm | | Need & Importance of Communication Skill | | Ms Priya Salunkhe | | |

H. O. D.
Applied Science Dep

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## Savitribai Phule Pune University, Pune
## For All faculties

## 2 credit Compulsory course for all the First Year students in All Faculties
## Democracy, Election and Governance

**Objectives:**

1. To introduce the students meaning of democracy and the role of the governance
2. To help them understand the various approaches to the study of democracy and governance

### Module 1 Democracy- Foundation and Dimensions

a. Constitution of India
b. Evolution of Democracy- Different Models
c. Dimensions of Democracy- Social, Economic, and Political

### Module 2 Decentralization

a. Indian tradition of decentralization
b. History of panchayat Raj institution in the lost independence period
c. 73$^{rd}$ and 74$^{th}$ amendments
d. Challenges of caste, gender, class, democracy and ethnicity

### Module 3 Governance

a. Meaning and concepts
b. Government and governance
c. Inclusion and exclusion

# 4. ENVIRONMENT AND SUSTAINABILITY

## A. DEPARTMENT OF ELECTRONIC AND TELECOMMUNICATION

| Savitribai Phule Pune University | | |
|---|---|---|
| Second Year of Electronics / E & Tc Engineering (2019 Course) | | |
| 204190: Mandatory Audit Course - 3 | | |
| **Teaching Scheme:** | **Credit** | **Examination Scheme:** |
| -- | -- | -- |

### List of Courses to be opted (Any one) under Mandatory Audit Course 3

- Technical English For Engineers
- Ecology and Environment
- Ecology and Society
- German I
- Science, Technology and Society
- Introduction to Japanese Language and Culture

#### GUIDELINES FOR CONDUCTION OF AUDIT COURSE

In addition to credits courses, it is mandatory that there should be audit course (non-credit course) from second year of Engineering. The student will be awarded grade as AP on successful completion of audit course. The student may opt for two of the audit courses (One in each semester). Such audit courses can help the student to get awareness of different issues which make impact on human lives and enhance their skill sets to improve their employability. List of audit courses offered in the semester is provided in the curriculum. Student can choose one of the audit course from list of courses mentioned. Evaluation of audit course will be done at institute level.

The student registered for audit course shall be awarded the grade AP and shall be included such grade in the Semester grade report for that course, provided student has the minimum attendance as prescribed by the Savitribai Phule Pune University and satisfactory in-semester performance and secured a passing grade in that audit course. No grade points are associated with this 'AP' grade and performance in these courses is not accounted in the calculation of the performance indices SGPA and CGPA. Evaluation of audit course will be done at institute level itself.

| Savitribai Phule Pune University | | |
| --- | --- | --- |
| Third Year of E & Tc Engineering (2019 Course) | | |
| 304191 (A): Mandatory Audit Course - 5 | | |
| **Teaching Scheme:** | **Credit** | **Examination Scheme:** |
| -- | -- | -- |

## List of Courses to be opted (Any one) under Mandatory Audit Course 5

- Developing Soft skills and Personality
- Entrepreneurship and IP Strategy
- Urbanization and Environment
- Environmental & Resource Economics
- Environment and Development
- Globalization and Culture

## GUIDELINES FOR CONDUCTION OF AUDIT COURSE

In addition to credits courses, it is mandatory that there should be audit course (non-credit course) from second year of Engineering. The student will be awarded grade as AP on successful completion of audit course. The student may opt for two of the audit courses (One in each semester). Such audit courses can help the student to get awareness of different issues which make impact on human lives and enhance their skill sets to improve their employability. List of audit courses offered in the semester is provided in the curriculum. Student can choose one of the audit course from list of courses mentioned. Evaluation of audit course will be done at institute level.

The student registered for audit course shall be awarded the grade AP and shall be included such grade in the Semester grade report for that course, provided student has the minimum attendance as prescribed by the Savitribai Phule Pune University and satisfactory in-semester performance and secured a passing grade in that audit course. No grade points are

## B. DEPARTMENT OF COMPUTER ENGINEERING

Curriculum for Third Year of Computer Engineering (2019 Course), Savitribai Phule Pune University

| AC6-II Sustainable Energy Systems |
|---|

**Prerequisites:** General awareness of environment and natural resources of energy

**Course Objectives:**
- To understand the importance of sustainable energy systems development
- To create awareness about renewable energy sources and technologies
- To learn about adequate inputs on a variety of issues in harnessing renewable energy
- To recognize current and possible future role of renewable energy sources

**Course Outcomes:**

On completion of the course, learners will be able to

**CO1:** Comprehend the importance of Sustainable Energy Systems

**CO2:** Correlate the human population growth and its trend to the natural resource degradation and develop the awareness about his/her role towards Sustainable Energy Systems protection

**CO3:** Identify different types of natural resource pollution and control measures

**CO4:** Correlate the exploitation and utilization of conventional and non-conventional resources

| Course Contents |
|---|

1. **Wind Energy:** Power in the Wind, Types of Wind Power Plants (WPPs), Components of WPPs, Working of WPPs, Siting of WPPs, Grid integration issues of WPPs.

2. **Solar Pv and Thermal Systems:** Solar Radiation, Radiation Measurement, Solar Thermal Power Plant, Central Receiver Power Plants, Solar Ponds, Thermal Energy storage system with PCM, Solar Photovoltaic systems: Basic Principle of SPV conversion, Types of PV Systems, Types of Solar Cells, Photovoltaic cell concepts: Cell, module, array, PV Module I-V Characteristics, Efficiency and Quality of the Cell, series and parallel connections, maximum power point tracking, Applications.

3. **Other Energy Sources:** Tidal Energy: Energy from the tides, Barrage and Non Barrage Tidal power systems. Wave Energy: Energy from waves, wave power devices. Ocean Thermal Energy Conversion (OTEC), Hydrogen Production and Storage. Fuel cell: Principle of working, various types, construction and applications. Energy Storage System, Hybrid Energy Systems.

**Reference Books :**

1. Joshua Earnest, Tore Wizeliu, "Wind Power Plants and Project Development", PHI Learning Pvt.Ltd, New Delhi, 2011.

2. D.P.Kothari, K.C Singal, Rakesh Ranjan, "Renewable Energy Sources and Emerging Technologies", PHI Learning Pvt.Ltd, New Delhi, 2013.

3. A.K.Mukerjee and Nivedita Thakur, "Photovoltaic Systems: Analysis and Design", PHI Learning Private Limited, New Delhi, 2011.

## AC3-III: Environmental Studies

Environmental studies are the field that examines this relationship between people and the environment. An environmental study is an interdisciplinary subject examining the interplay between the social, legal, management, and scientific aspects of environmental issues.

### Course Objectives:

1. Understanding the importance of ecological balance for sustainable development.
2. Understanding the impacts of developmental activities and mitigation measures.
3. Understand and realize the multi-disciplinary nature of the environment, its components, and inter-relationship between man and environment
4. Understand the relevance and importance of the natural resources in the sustenance of life on earth and living standard

### Course Outcomes:

On completion of the course, learner will be able to–

**CO1: Comprehend** the importance of ecosystem and biodiversity

**CO2: Correlate** the human population growth and its trend to the environmental degradation and develop the awareness about his/her role towards environmental protection and prevention

**CO3: Identify** different types of environmental pollution and control measures

**CO4: Correlate** the exploitation and utilization of conventional and non-conventional resources

### Course Contents

1. **Natural Resources:** Introduction, Renewable and non-renewable, Forest, water, mineral, food, energy and land resources, Individual and conservation of resources, Equitable use of resources.
2. **Ecosystems:** Concept, Structure, Function, Energy flow, Ecological succession, Forest, grassland, desert and aquatic ecosystems - Introduction, characteristic features, structure and function.
3. **Biodiversity:** Genetic, Species and ecological diversity, Bio Geographical classification of India, Value and hot spots, Biodiversity at global, national and local levels, India as mega-biodiversity nation, Threats to biodiversity, Endangered and endemic species of India, Conservation of Biodiversity, Endangered and endemic species, Conservation of biodiversity.
4. **Pollution:** Definition, Causes, effects and control measures of the pollution – Air, soil, Noise, Water, Marine and Thermal and Nuclear Pollution, Solid waste management, Role of Individual in Prevention of Pollution, Pollution #Exemplar/Case Studies, Disaster management

### Reference:

1. Bharucha, E.,–Textbook of "Environmental Studies", Universities Press(2005),ISBN-10:8173715408
2. Mahua Basu, "Environmental Studies", Cambridge University Press, ISBN-978-1-107-5317-3

### @The CO-PO Mapping Matrix

| CO\PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | - | - | - | - | - | - | 3 | - | - | - | - | - |

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## C. DEPARTMENT OF INFORMATION TECHNOLOGY

Curriculum for Second Year of Information Technology (2019 Course), Savitribai Phule Pune University

| Savitribai Phule Pune University, Pune |
|---|
| **Second Year Information Technology (2019Course)** |
| **214459 ( C ): Mandatory Audit course 4 :** |
| **e-Waste Management and Pollution Control** |

| Teaching Scheme: | Credit Scheme: | Examination Scheme: |
|---|---|---|
| 01hrs/week | Non Credit course | Audit Course |

**Prerequisite Courses: if any: --**

**Course Objectives :**

1. To make the students aware about importance of environmental study.
2. To study impact of professional engineering products in societal contexts.
3. To understand impact of professional engineering products in environmental contexts.
4. To learn e-waste management and e-waste recycling process.
5. To understand causes, effects and control measures of environment pollutions.
6. To learn impact of environment controlling methods on human health.

**Course Outcomes :**

On completion of the course, learner will be able to --

    **CO1:** Discuss various types of e-waste sources.

    **CO2:** Understand impact of various e-wastes.

    **CO3:** Identify characteristics of various e-Waste pollutants.

    **CO4:** Understand process of e-Waste Recycling and relevant technologies.

    **CO5:** Discuss causes, effects and control measures of different environment pollution.

    **CO6:** Demonstrate Safe methods for disposal of e-waste and controlling the pollution.

| COURSE CONTENTS | | |
|---|---|---|
| **Unit I** | **E-Waste Overview and Sources** | **02 hrs** |
| e-waste Overview: What is e-waste, E-waste growth- An overview, hazards of e-waste **Sources of e-wastes:** Discarded computers, televisions. VCRs. stereos, copiers, fax machines, electric lamps, cell phones, audio equipment and batteries if improperly disposed. | | |
| **Mapping of Course Outcomes for Unit I** | CO1 | |
| **Unit II** | **Impact of various e-wastes** | **02 hrs** |
| Solder in printed circuit boards, glass panels and monitors, Chip resistors and semiconductors, Relays and switches, Printed Circuit Boards, Cabling and computer housing, Plastic housing of electronic equipment and circuit boards, Front panel of CRTs, Motherboards. | | |
| Mapping of Course | CO2 | |

| Savitribai Phule Pune University, Pune | | |
|---|---|---|
| **Third Year Information Technology (2019 Course)** | | |
| **Mandatory Audit Course 6** | | |
| **314459 (A) : Green and Unconventional Energy** | | |
| **Teaching Scheme:** | **Credit Scheme:** | **Examination Scheme:** |
| **Theory (TH) : 1 hrs/week** <br> **Tutorial(TUT): 3 hrs/week** <br> **(Assignments and Self-study)** | **Non Credit** | **Audit Course** |

**Prerequisite Courses,** if any:

**Course Objectives:**
1. To know the importance of the energy and the the basic infrastructures for the economic development of the country.
2. To know about the most important renewable energy resources and the technologies for harnessing these resources within the framework of a broad range of simple to state- of -the-art energy systems.
3. To understand the application of non-conventional energy technologies.

**Course Outcomes:**

On completion of the course, students will be able to—

**CO1:** List and explain the main sources of energy and their primary applications in the India, and theworld.

**CO2:** Describe the challenges and problems associated with the use of various energy sources and itsconservation.

**CO3:** List and describe the primary renewable energy resources and technologies.

**CO4:** Collect and organize information on renewable energy technologies as a basis for further analysis and evaluation.

| **COURSE CONTENTS** | | |
|---|---|---|
| **Unit I** | **INTRODUCTION TO GREEN AND UNCONVENTIONAL ENERGY STUDIES** | **( 04 hrs)** |

Various Non-Conventional energy sources, Need, Availability, Classification, Relative merits & demerits, Global energy scenario, Indian energy scenario, Energy Storage, Distribution and Conservation

| **Mapping of Course Outcomes for Unit I** | **CO1, CO2** | |
|---|---|---|
| **Unit II** | **SOLAR and WIND ENERGY** | **( 04 hrs)** |

HOME

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| | |
|---|---|
| 4. | **Demonstration of Drilling machine** |
| | Demonstration on construction of Radial drilling machine, Tool holding devices, Concept of speed, feed and depth of cut. |
| 5. | **Demonstration on Milling machine** |
| | Demonstration on construction, table movements, indexing and tooling of milling machine. |
| 6. | **Demonstration of Shaper/Grinding machine (Any one)** |
| | Shaper: Crank and slotted link mechanism, Work feed mechanism |
| | Grinding: Surface grinder/Cylindrical grinding machine, Mounting of grinding wheel |
| 7. | **Term work includes one job of Carpentry** |
| | Introduction to wood working, kinds of woods, hand tools & machines, Types of joints, wood turning. Pattern making, types of patterns and its allowances. |
| 8. | **Term work to include one job involving fitting** to size, male-female fitting with drilling and tapping operation on Mild Steel plate; |
| | Introduction to marking, cutting and sawing, sizing of metal, shearing, Concept of fits and interchangeability, selection of datum and measurements. |
| 9. | **Term work to include one utility job preferably using sheet metal** (e.g. Tray, Funnel etc.) with riveting/welding/brazing/soldering (at least one temporary and one Permanent joint either using resistance welding/Arc welding); |
| | Introduction to sheet metal operations: punching, blanking, bending, drawing. |
| 10. | **Prepare a Layout of Workshop** |
| | To prepare a work shop layout. |
| 11. | **Collection of information about safety norms** in any one of the following type of industry:Metalworking/Chemical/Cement/Pharmaceuticals/Defense/Atomic energy/Aerospace /Marine/Construction/Railway etc. |

Reference/Text Books
1. John, K. C., (2010),"Mechanical Workshop Practice, Prentice Hall Publication, New Delhi
2. Hazra and Chaudhary, Workshop Technology-I & II, Media promoters & Publisher Pvt. Ltd.

**101007: Environmental Studies-I**

TH:02 Hrs./week          (Mandatory Non-Credit Course)

**Course Objectives:**
1. To explain the concepts and strategies related to sustainable development and various components of environment.
2. To examine biotic and abiotic factors within an ecosystem, to identify food chains, webs, as well as energy flow and relationships.
3. To identify and analyze various conservation methods and their effectiveness in relation to renewable and nonrenewable natural resources.
4. To gain an understanding of the value of biodiversity and current efforts to conserve biodiversity on national and local scale.

**Course Outcomes:**On completion of the course, learner will be able to–

**CO1:**Demonstrate an integrative approach to environmental issues with a focus on sustainability.

**CO2:** Explain and identify the role of the organism in energy transfers in different ecosystems.

**CO3:** Distinguish between and provide examples of renewable and nonrenewable resources & analyze personal consumption of resources.

**CO4:** Identify key threats to biodiversity and develop appropriate policy options for conserving biodiversity in different settings.

**Evaluation and Continuous Assessment:**

It is recommended that the all activities are to be record and regularly, regular assessment of work to be done and proper documents are to be maintained at college end by both students as well as mentor (you may call it PBL work book).

Continuous Assessment Sheet (CAS) is to be maintained by all mentors/department and institutes.
Recommended parameters for assessment, evaluation and weightage:

- Idea Inception **(5%)**
- Outcomes of PBL/ Problem Solving Skills/ Solution provided/ Final product **(50%)** (Individual assessment and team assessment)
- Documentation (Gathering requirements, design & modeling, implementation/execution, use of technology and final report, other documents) **(25%)**
- Demonstration (Presentation, User Interface, Usability etc) **(10%)**
- Contest Participation/ publication **(5%)**
- Awareness /Consideration of -Environment/ Social /Ethics/ Safety measures/Legal aspects **(5%)**

PBL workbook will serve the purpose and facilitate the job of students, mentorand project coordinator. This workbook will reflect accountability, punctuality, technical writing ability and work flow of the work undertaken.

**References:**
- Project-Based Learning, Edutopia, March 14, 2016.
- What is PBL? Buck Institute for Education.
- www.schoology.com
- www.wikipedia.org
- www.howstuffworks.com

| 101014: Environmental Studies-II |
|---|
| **TH:    02 Hr/week            Mandatory Non-Credit Course** |

**Course Objectives:**
1. To provide a comprehensive overview of environmental pollution and the science and technology associated with the monitoring and control.
2. To understand the evolution of environmental policies and laws.
3. To explain the concepts behind the interrelations between environment and the development.
4. To examine a range of environmental issues in the field, and relate these to scientific theory.

**Course Outcomes:** On completion of the course, learner will be able to–

**CO1:** Have an understanding of environmental pollution and the science behind those problems and potential solutions.

**CO2:** Have knowledge of various acts and laws and will be able to identify the industries that are violating these rules.

**CO3:** Assess the impact of ever increasing human population on the biosphere: social, economic issues and role of humans in conservation of natural resources.

**CO4:** Learn skills required to research and analyze environmental issues scientifically and learn how to use those skills in applied situations such as careers that may involve environmental problems and/or issues.