Savitribai Phule Pune University Second Year Information Technology (2019 Course) **214449: Soft Skill Lab**		
Teaching Scheme:	**Credit Scheme :**	**Examination Scheme:**
Practical (PR) : 02 hrs/Week	**01**	**TW : 25 Marks**

Prerequisites , If any: ------

Course Objectives:

1. To facilitate a holistic development of students while focusing on enhancing soft skills.
2. To highlight the need to improve soft skills among engineering students so as to become good professionals.
3. To develop and nurture the soft skills of the students through individual and group activities.
4. To expose students to right attitudinal and behavioural aspects and assist in building the same through activities.

Course Outcomes:

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

CO1: Introspect about individual's goals, aspirations by evaluating one's SWOC and think creatively.

CO2: Develop effective communication skills including Listening, Reading, Writing and Speaking.

CO3: Constructively participate in group discussion, meetings and prepare and deliver Presentations.

CO4: Write precise briefs or reports and technical documents.

CO5: Practice professional etiquette, present oneself confidently and successfully handle personal interviews .

CO6: Function effectively in multi-disciplinary and heterogeneous teams through the knowledge of team work, Inter-personal relationships, conflict management and leadership quality.

COURSE CONTENTS		
Unit I	**Introspective & Self Development**	**04 hrs**

Introduction to soft skills, SWOC analysis, planning career, setting short-term & long-term goals, identifying difference between jobs & career, aligning aspirations with individual skills, understanding self-esteem, developing discipline and critically evaluating oneself

Mapping of Course Outcomes for Unit I	CO1, CO6	
Unit II	**Communication Skills**	**04 hrs**

Essentiality of good communication skills, importance of feedback, different types of communication, barriers in communication and how to overcome these barriers, significance of non-verbal messages as augmentation to verbal communication, group discussion, listening vs hearing, reading to comprehend, learning to skim and scan to extract relevant information, effective digital communication

Mapping of Course Outcomes for Unit II	CO2, CO3, CO5	

Unit III	Language and Writing Skills	04 hrs
Fundamentals of english grammar, improve lexical resource, essential steps to improve spoken and written english, business vocabulary, writing – email, resume, formal letter, official communication, essay, presentation – planning, organizing, preparing and delivering professional presentation		
Mapping of Course Outcomes for Unit III	CO2, CO4	
Unit IV	Leadership Skills and Group Dynamics	04 hrs
Understanding corporate culture and leadership skills, difference between a leader and a manager, importance of resilience in a professional surrounding, developing empathy and emotional intelligence, being assertive and confident, 4-Ds of decision making, creative and solution-centric thinking, resolving conflicts, working cohesively as a team to achieve success, five qualities of an effective team – positivity, respect for others, trust, goal-focused, supportiveness		
Mapping of Course Outcomes for Unit IV	CO1, CO5, CO6	
Unit V	Ethics, Professional Etiquette	04 hrs
Understanding ethics and morals, importance of professional ethics, hindrances due to absence of work ethics, professional etiquette – introductions, with colleagues, attire, events, dinning, telephone, travelling, netiquette, social media, writing		
Mapping of Course Outcomes for Unit V	CO5, CO6	
Unit VI	Stress And Time Management	04 hrs
Stress as integral part of life, identifying signs and sources of stress, steps to cope with stress – open communication, positive thinking, belief in oneself, ability to handle failure, retrospective thinking for future learning, organizing skills to enhance time management, focusing on goals, smart work vs hard work, prioritizing activities, perils of procrastination, daily evaluation of "to-do" list.		
Mapping of Course Outcomes for Unit VI	CO1, CO3, CO6	
Text Book :		
1. Gajendra Singh Chauhan, Sangeeta Sharma,"Soft Skills – An Integrated Approach to Maximize Personality", WILEY INDIA, ISBN:13:9788126556397		
Reference Books :		
1. Indrajit Bhattacharya, "An Approach to Communication Skills", Delhi, DhanpatRai, 2008 2. Simon Sweeney, "English for Business Communication", Cambridge University Press, ISBN 13:978-0521754507 3. Sanjay Kumar and Pushpa Lata, "Communication Skills", Oxford University Press, ISBN 10:9780199457069 4. Atkinson and Hilgard, "Introduction to Psychology", 14th Edition, Geoffrey Loftus, ISBN-10:0155050699, 2003 5. Kenneth G. Mcgee, "Heads Up: How to Anticipate Business Surprises & Seize Opportunities		

First", Harvard Business School Press, Boston, Massachusetts, 2004, ISBN 10:1591392993
6. Krishnaswami, N. and Sriraman T., "Creative English for Communication" , Macmillan

Guidelines for Student's Lab Journal and TW Assessment

Each student should have a Lab Workbook (sample workbook attached) which outlines each lab activity conducted. The student must respond by writing out their learning outcomes and elaborating the activities performed in the lab. Continuous assessment of laboratory work is to be done based on overall performance and lab assignments and performance of student. Each lab assignment assessment will be assigned grade/marks based on parameters with appropriate weightage. Suggested parameters for overall assessment as well as each lab assignment assessment include- timely completion, performance, punctuality, neatness, enthusiasm, participation and contribution in various activities-SWOC analysis, presentations, team activity, event management, group discussion, group exercises and interpersonal skills and similar other activities/assignments.

Guidelines for Conduction of Soft Skills Lab

The teacher may design specific assignments that can highlight the learning outcomes of each unit. Each activity conducted in the lab should begin with a brief introduction of the topic, purpose of the activity from a professional point of view and end with the learning outcomes as feedback from students. Most of the lab sessions can be designed to be inclusive; allowing students to learn skills experientially; which will benefit them in the professional environment. Every student must be given sufficient opportunity to participate in each activity and constructive feedback from the instructor / facilitator at the end of the activity should learn towards encouraging students to work on improving their skills. Activities should be designed to respect cultural, emotional and social standing of students. Some of the activities can be designed to cater to enhancement of multiple skills – For e.g. – Team Building Activity can highlight 'open communication', 'group discussion', 'respecting perspectives', 'leadership skills', 'focus on goals' which can help students improve their inherent interpersonal skills.

At least one session should be dedicated to an interactive session that will be delivered by an expert from the industry; giving the students an exposure to professional expectations.

Virtual Laboratory

- **https://ve-iitg.vlabs.ac.in/**

Recommended List of Lab Sessions

1. Introduction of Self / SWOC Analysis -- CO1, CO4

a. Explain how to introduce oneself in a professional manner and presenting oneself positively Name, Academic Profile, Achievements, Career Aspirations, Personal Information (hobbies, family, social).
b. Focus on introspection and become aware of one's Strengths, Weakness, Opportunities and Challenges.
Students can write down their SWOC in a matrix and the teacher can discuss the gist personally.

2. Career Goals and Planning -- CO1, CO4

a. Make students understand the difference between a job and a career. Elaborate steps on how to plan a career.
Students can choose a career and they should write down what skills, knowledge, steps are need

to be successful in that particular career and how they can get the right opportunity.
b. Explain to students how to plan short term and long term goals.
Think and write down their short-term goals and long terms goals. Teacher can read and discuss (provide basic counselling) about the choices written.

3. Public Speaking -- (Choose any 2) -- CO3, CO2

a. Prepared Speech
Topics will be shared with students and they will be given 10 minutes to prepare and 3 minutes to deliver followed by Q&A from audience. Teacher will evaluate each student based on content, communication skills, logical and cohesive presentation of topic, perspective of student, ability to handle questions and respond positively.

b. Extempore Speech
Various topics will be laid out in front of the audience and each student is to pick one topic and speak about the topic for 5 minutes followed by Q&A from audience. Teacher will evaluate each student based on ability to think on his/her feet, content, communication skills, logical and cohesive presentation of topic, perspective of student, ability to handle questions and respond positively.

c. Reviewing an Editorial article
Either using e-paper / printed copy, students have to select a recent editorial (that is non-controversial), read it and explain to the audience what the editor's perspective is and what the student's perspective is.

d. Book Review
Each student will orally present to the audience his/her review of a book that he/she has recently read.

4. Group Discussion -- CO3, CO2

a. The class will be divided into groups of 8 – 10 students in for a discussion lasting 10 minutes.
b. Topics should be topical and non-controversial. After each group finishes its discussion, the teacher will give critical feedback including areas of improvement. The teacher should act as a moderator / observer only

5. Listening and Reading Skills -- CO2

a. Listening Worksheets to be distributed among students
Each student will be given specifically designed worksheets that contain blanks / matching / MCQs that are designed to an audio (chosen by the faculty). Students have to listen to the audio (only once) and complete the worksheet as the audio plays. This will help reiterate active listening as well as deriving information (listening to information between the lines)
b. Reading Comprehension Worksheets to be distributed/displayed to students
Teacher will choose reading passages from non-technical domains, design worksheets with questions for students to answer. This will enhance student's reading skills by learning how to skim and scan for information.

6. Writing Skills (Choose any 2) -- CO2

a. Letter / Email Writing
After explaining to the students the highlights of effective writing, students can be asked to write (using digital platforms / paper-based) letter to an organization with the following subject matter,
i. Requesting opportunity to present his/her product.
ii. Complaining about a faulty product / service.

    iii. Apologizing on behalf of one's team for the error that occurred.

    iv. Providing explanation for a false accusation by a client.

b. Report Writing

After describing various formats to write report and explaining how to write a report, each student should be asked to write a report (digital/ paper-based) on any of the following topics,

    i. Industrial visit.

    ii. Project participated in.

    iii. Business / Research Proposal.

c. Resume Writing

The teacher should conduct a brief session outlining the importance of a CV / Resume and students can write / type out their own resumes

    i. Share various professional formats.

    ii. Focus on highlighting individual strengths.

    iii. Develop personalized professional goals / statement at the beginning of the resume.

7. Team Building Activities -- CO3, CO4

The class will be divided into groups of 4-5 students in each group and an activity will be given to each group.

The activities chosen for each team should be competitive and should involve every student in the team. The activities may be conducted indoors or outdoors depending on infrastructure. While selecting the team, ensure that each team has a mix of students who have varied skills. The teacher should give critical feedback including areas of improvement at the end of the activity.

8. Expert Lecture -- CO4

Highlighting the need to manage stress and time, experts from the fields of health and fitness, counselling, training, medical or corporate HR may be invited to deliver a participatory session that focus on helping students to cope with parental, social, peer and career pressures.

9. Lateral and Creative Thinking -- CO1, CO4

Every student needs to step out of the linear thinking and develop lateral and creative thinking. Teacher can develop creative activities in the classroom / lab that will help students enhance their creative thinking. Some of the suggested activities,

    i. Each group (3-4 students) can be given random unrelated items and they will be given sufficient time to come up with creative ideas on how the objects can be used for activities / purposes other than its intended one.

    ii. Each student is given a random line and he/she has to spin a fictional story and tell it to the class (3 minutes). Each story should have a beginning, middle and end.

    iii. Each group (3-4 students) can be given a fictional / hypothetical dangerous situation and they have to find a solution to that problem. They can present it to the other teams who will then get the opportunity to pick flaws in the ideas.

10. Mock Interviews -- CO2, CO3

Student has to undergo interview session and the teacher should seek the assistance of another faculty member / TPO Officer/ Alumni to act as interview panel. Students will be informed beforehand about the job profile that they are appearing the interview for and they have to come prepared with a printed copy of their resume, formally dressed. Questions will include technical as well as HR. Interviewer can choose to give problems to solve using technical skills. Students will be graded on the basis of their technical knowledge, ability to answer questions well, presentation of self, body language and verbal skills.

11. Presentation Skills -- CO2, CO3
Every student will have to choose a topic of his/her choice and make a 5-minute presentation using audio-video aids / PPT. The topic can either be technical or non-technical. Focus and evaluation of each presentation should be the depth of knowledge about the topic, originality of perspective on the topic, well-researched or not, verbal and non-verbal skills and ability to answer questions effectively. Plagiarism should be discredit and students should be instructed about it.
12. Corporate and Business Etiquette -- CO4, CO1
The teacher can design an interactive session that allows students to be involved in understanding the requirements of a corporate environment. This can be done using innovative quiz competition in the classroom and the teacher explaining the concept / relevance of that particular aspect in the professional context. Alternatively, the teacher can invite professionals to have an interactive session with students about various aspects of professional etiquette.

Savitribai Phule Pune University, Pune
Second Year Information Technology (2019 Course)
214450 (A): Mandatory Audit Course 3:
Ethics and Values in Information Technology

Teaching Scheme:	Credit Scheme:	Examination Scheme:
01hrs/week	**Non Credit**	**Audit Course**

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.

COURSE CONTENTS		

Unit -I	An Overview of Ethics	03hrs

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.

Mapping of Course Outcomes for Unit I	CO1 , CO2

Unit- II	Computer And Internet Crime	03hrs

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 Responsibility, 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

Mapping of Course Outcomes for Unit II	CO3, CO4

Unit- III	Social Networking &Ethics of IT Organization	03 hrs

Social Networking: Brief about Social Networking, **Social Networking Ethical Issues***:* Cyber bullying, Cyber stalking, Encounters with Sexual Predators, Uploading of Inappropriate Material,

Online Virtual Worlds: Crime in Virtual Worlds, Educational and Business Uses of Virtual Worlds.

Ethics of IT Organization: Key Ethical Issues for Organizations, of Workers, Outsourcing, Whistle-blowing, Code of Ethics and Professional Conduct.

Mapping of Course Outcomes for Unit III	CO2, CO3, CO4

Unit - IV	Case Study	03hrs

Malware, Medical Implants, Abusive Workplace Behaviour, Automated Active Response Weaponry, Malicious Inputs to Content Filters.

Mapping of Course Outcomes for Unit IV	CO1, CO2, CO3, CO4

Text Books:

1. George Reynolds,"Ethics in Information Technology", Cengage learning, 5th Edition
2. R. Subramanian, "Professional Ethics", OXFORD University Press, Second Edition

Reference Books:

1. William Lillie,"An Introduction to Ethics", Allied Publishers
2. Charles b. Fleddermann, "Engineering Ethics", Prentice Hall
3. M.Govindarajan,S.Natarajan&V.S.Senthilkumar, "Engineering Ethics &Human Values", PHI Learning
4. "ACM Code of Ethics and Professional Conduct Case Studies" **https://www.acm.org/code-of-ethics/case-studies**
5. "Case Studies of Ethics", **https://flylib.com/books/en/4.269.1.115/1/**
6. "UNODC Case Studies" **https://www.unodc.org/e4j/en/integrity-ethics/module-12/exercises/case-studies.html**

Evaluation :

Students should select any one of the topic in a group of 3 to 5. Students should submit a written report and make a presentation on the topic. The task should not be repeated among students. Report will be evaluated by the faculty as per rubrics defined by him/her/them at start of course.

Savitribai Phule Pune University, Pune

Second Year Information Technology (2019 Course)

214450 (B) : Mandatory Audit Course3:

Quantitative Aptitude & Logical Reasoning

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

Prerequisite Courses, if any:--

Course Objectives:

1. To develop the quantitative, logical and verbal abilities.
2. To enable learners to interpret the data accurately.
3. To build logical thinking ability among the learners.
4. To enable students to comprehend the English text.

Course Outcomes:

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

CO1: Apply basic concepts of quantitative abilities

CO2: Use logical reasoning for solving real world problems

CO3: Compete in examinations like internships, industry placements, postgraduate admissions, civil services etc.

COURSE CONTENTS		
Unit I	**Fundamental Quantitative Abilities**	**03 hrs**

Concepts and Problems on Number System, HCF and LCM, Average, Ratio and Proportion, Percentage, Year month days counting, SI units and measurements

Mapping of Course Outcomes for Unit I	**CO1, CO2, CO3**	
Unit II	**Arithmetic Quantitative Abilities**	**02 hrs**

Concepts and Problems on Ages, Profit and loss, Simple and Compound interest, Time value of money, Time and distance, Time and Work, Geometry and Coordinate Geometry, logarithms

Mapping of Course Outcomes for Unit II	**CO1, CO2, CO3**	
Unit III	**Logical Reasoning Ability**	**02 hrs**

Number Series, Pattern recognition, Alpha Numerical, Letter & Symbol Series , Numerical and Alphabet Puzzles, Seating Arrangement

Mapping of Course Outcomes for Unit III	**CO2,CO3**	
Unit IV	**Thinking and Reasoning**	**02 hrs**

Objective Reasoning, Graph and Plots, Data sufficiency, Blood Relation, Coding deductive logic, Logical word sequence

Mapping of Course Outcomes for Unit IV	CO2, CO3	
Unit V	**Verbal Ability**	**03 hrs**

Synonyms, Antonyms, Contextual Vocabulary, Error Identification, Sentence Correction, Sentence Improvement, Subject-Verb agreement, Tenses and Articles, Reading Comprehension, Preposition & Conjunction

Mapping of Course Outcomes for Unit V	CO1, CO2, CO3

Text Books:
1. Quantitative abilities by Arun Sharma, Motilal Uk Books Of India, 2012
2. Quantitative Aptitude for Competitive Examinations by R S Agrawal
3. Verbal and Non-Verbal reasoning by R S Agrawal

Evaluation :
Students should select any one of the topic in a group of 3 to 5. Students should submit a written report and make a presentation on the topic. The task should not be repeated among students. Report will be evaluated by the faculty as per rubrics defined by him/her/them at start of course.

Savitribai Phule Pune University, Pune		
Second Year Information Technology (2019 Course)		
214458: Project Based Learning		
Teaching Scheme:	**Credit Scheme:**	**Examination Scheme:**
Practical (PR): 04hrs/week	**02**	**TW : 50 Marks**
Prerequisite Courses, if any:		
Preamble: Project Based Learning (PBL) is an instructional approach that emphasizes critical-thinking, collaboration and personalized learning. In PBL, student groups engage in meaningful inquiry that is of personal interest to them. These projects are based on problems, which are real-life oriented, curriculum-based and often interdisciplinary. Students decide how to approach a problem and what activities or processes they will perform. They collect information from a variety of sources, analyze, synthesize and derive understanding from it. The real-world focus of PBL activities is central to the process because it motivates students and adds value to their work. Their learning is connected to something real and involves life skills such as collaboration and reflection. The faculty assigned to the group is referred as mentor. Technology enables students and Mentor in various phases of the PBL process. At the end of the PBL, students demonstrate their newly acquired knowledge and are evaluated by how much they have learned and how well they communicate it. Students also conduct self-evaluation to assess their own growth and learning. Throughout this process, the mentor's role is to guide and advise students, rather than to direct and manage student work.		
Companion Course: Online courses relevant to the project, along with expert lecture on Intellectual property rights, patents and software engineering.		
Course Objectives : 1. To learn the various processes involved in project based learning. 2. To develop critical thinking and engineering problem solving skills amongst the students. 3. To explain the roles and responsibilities of IT engineers to the solution of engineering problems within the social, environmental and economic context. 4. To equip the students with knowledge and skills require to develop solutions for the problems coming from various Hackathon.		

Course Outcomes
 On completion of the course, student will be able to --
     CO1: Design solution to real life problems and analyze its concerns through shared cognition.
     CO2: Apply learning by doing approach in PBL to promote lifelong learning.
     CO3: Tackle technical challenges for solving real world problems with team efforts.
     CO4: Collaborate and engage in multi-disciplinary learning environments.		

COURSE CONTENTS
Group Structure
Group structure should enable students to work in mentor–monitored groups. The students plan, manage and complete a task/project / activity which addresses the stated problem. 1. There should be a team of 3 to 6 students who will work cohesively. 2. A Mentor should be assigned to individual groups who will help them with learning and development process.
Selection of Project/Problem
1. The project scope/topic can be from any field/area, but selection related to IT technical aspect is desirous. 2. The project/problem done in first year engineering could be extended further, based on its potential and significance analysis. 3. Project/problem requiring solutions through conceptual model development and use of software tools should be preferred. 4. Different alternate approaches such as theoretical, practical, working model, demonstration or software analysis should be used in solving/implementing of project/problem. 5. The project/problem requiring multi-disciplinary approach to solve it, should be preferred. 6. Problem may require in depth study of specific practical, scientific or technical domain. 7. Hands-on activities, organizational and field visits, interacting with research institutes and expert consultation should be included in the approach to make students aware of latest technologies.
Assessment

The department should be committed to assess and evaluate both student performance and solution impact.

Progress of PBL will be monitored regularly on weekly basis. Weekly review of the work is necessary. During process of monitoring and continuous assessment and evaluation the individual and team performance is to be measured by mentor.

Students must maintain an institutional culture of authentic collaboration, self- motivation, peer-learning and personal responsiveness. The institution/department should support students in this regard through guidance/orientation programs and the provision of appropriate resources and services. Supervisor/mentor and students must actively participate in assessment and evaluation processes. Group may demonstrate their knowledge and skills by developing a public product and/or report and/or presentation.

1. Individual assessment for each student (Understanding individual capacity, role and involvement in the project).

2. Group assessment (roles defined, distribution of work, intra-team communication and togetherness.

3. Documentation and presentation.

Evaluation and Continuous Assessment

It is recommended that the all activities are to be recorded in PBL workbook, regular assessment of work to be done and proper documents are to be maintained at college end by both students as well as mentor.

The PBL workbook will reflect accountability, punctuality, technical writing ability and work flow of the task undertaken. Continuous Assessment Sheet (CAS) is to be maintained by all mentors/department.

Recommended parameters for assessment, evaluation and weightage:

1. Idea Inception (5%)
2. Outcomes of PBL/Problem Solving Skills/Solution provided/Final product**(40%)** (Individual assessment and team assessment)
3. Documentation (Gathering requirements, design & modeling, implementation/execution, use of technology and final report, other documents **(25 %)**
4. Potential for the patent**(10%)**
5. Demonstration (Presentation, User Interface, Usability etc.) **(10%)**
6. Contest Participation/ publication **(5%)**
7. Awareness /Consideration of Environment/ Social /Ethics/ Safety measures/Legal aspects **(5%).**

Design the rubrics based on the above parameters for evaluation of student performance

Faculty / Mentor is expected to perform following activities

Faculty/ Mentor is expected to perform following activities:

Revision of PBL concepts

Skill assessment of students

Formation of diversified and balanced groups

Share information about patent, copyright and publications to make students aware about it

Discussion of sample case studies

Design of the rubrics for evaluation of student performance

Discussion of the rubrics with students

Weekly Assessment of the deliverables such as Presentation, Report, Concept map, logbook

Scaffolding of the students

Summative and Formative assessment

Reference Books:

1. Project-Based Learning, Edutopia, March 14,2016.
2. What is PBL? Buck Institute forEducation.
3. www.schoology.com
4. www.wikipedia.org
5. www.howstuffworks.com

Savitribai Phule Pune University, Pune
Second Year Information Technology (2019Course)
214459 (A) : Mandatory Audit course 4:
Water Supply and Management

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

Prerequisite Courses: Basic knowledge of environmental science and mathematics

Course Objectives:

1. Enable the student to understand the various components of environment in and around the earth crust and understand the effects of it over plants, animals, etc
2. Understand the important concepts of good water supply system to a city/town or a village
3. Understand the need of conservation of rain water and its applications
4. Understand the sources, effects, prevention and control measures of water pollution and its legislative aspects.

Course Outcomes:

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

CO1: Relate the relations between the environment and ecology, estimating water requirement for public water supply scheme.

CO2: Assess the quality of water as per BIS and select the appropriate treatment method required for the water source.

CO3: Analyze the suitable distribution system for a locality and know the appurtenances used.

CO4: Summarize the arrangement of water supply and fittings in a building.

CO5: Determine the need of conservation of water and rural water supply.

CO6: Identify the sources of water pollution and suitable control measures.

COURSE CONTENTS		
Unit I	**Introduction To Environment, Water Requirement And Water Sources**	**02 hrs**

ENVIRONMENT AND ECOLOGY: Atmosphere, Lithosphere, Hydrosphere, Biosphere. Relation between Plant, Animals and Environment. Eco System, Man and Ecology.

WATER REQUIREMENT: Necessity of water supply, Methods of population forecasting (Arithmetical, Geometrical and Incremental Increase method), Water Requirements for a) Domestic Purpose b) Industrial Use c) Fire Fighting d) Public Purpose e) Losses. Per Capita Demand and Factors affecting it. Total Quantity of Water Required for a Town.
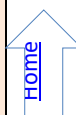
SOURCES OF WATER: Surface Sources - Lakes, Streams, Rivers. Impounded Reservoirs. Underground Sources - Infiltration Galleries, Infiltration Wells and Springs

Mapping of Course Outcomes for Unit I	CO1

Unit II	**Quality And Treatment Of Water**	**02 hrs**

QUALITY OF WATER: Impurities of water - organic and inorganic classification and examination of water. Physical - temperature, color, turbidity, taste and odour. Chemical - pH Value, Total Solids, Hardness, Chlorides, Iron and Manganese, Fluoride and Dissolved Oxygen. Bacteriological- E-coli, Most Probable Number (MPN), Quality Standards for Domestic purpose as perBIS.

TREATMENT OF WATER: Flow diagram of different units of treatment, brief description of constructional details, working and operation of the following units - plain sedimentation, sedimentation with coagulation, flocculation, filtration-Slow sand filters, Rapid sand filters and pressure filters (nodesign) Disinfection of water, Chlorination

Mapping of Course Outcomes for Unit II	CO2	
Unit III	**Water Distribution System**	**02 hrs**

DISTRIBUTION SYSTEM: General Requirements, Systems of Distribution- Gravity System, Combined System, Direct Pumping. Maintenance of required pressure in Distribution Systems. Storage- Underground, Ground Level And OverheadServiceReservoirs– Sketch,NecessityandAccessories.Typesoflay- out : dead end, grid iron, radial and ring systems, their merits and demerits and their suitability

APPURTENANCES IN DISTRIBUTION SYSTEM: Use of Sluice Valves, Check Valves, Air Valves, Scour Valves, Zero Velocity Valves, Fire Hydrants, Water Meter

Mapping of Course Outcomes for Unit III	CO3	
Unit IV	**Water Supply In Buildings**	**02 hrs**

Water Supply arrangement in Buildings: General lay-outofwatersupplyarrangementforsingleandmulti-storiedbuildingsasperB.I.S code of practice. Pipe Materials- Plastic Pipes, High Density Polythene Pipes, Densified cast iron pipes, Merits and Demerits. Connections from water main to buildings. Water supply fittings - their description and uses, water main, service pipes, supply pipe, distribution pipe, domestic storage tank, stop cock, ferrule, goose neck, water tap, Modern systems of Potable water purification-(RO, UV, Activated carbon), Hot water supply - electric and solar waterheaters.

Mapping of Course Outcomes for Unit IV	CO4	
Unit V	**Water Conservation**	**02hrs**

WATER CONSERVATION: Conservation of rain water, roof water harvesting, recharging of ground water. RURAL WATER SUPPLY: Rural water supply systems, Disinfection of well water.

Case Studies:	Refer suggested list of Case studies/ Students activities	
Mapping of Course Outcomes for Unit V	CO5	
Unit VI	**Water Pollution And Pollution control**	**02 hrs**

WATER POLLUTION AND CONTROL: Sources of water pollution, types and its effects, Prevention and control measures of water pollution, Legal aspects regarding water pollution control.

Mapping of Course Outcomes for Unit V	CO6

Reference Books :
1. S.K.Garg, Water Supply Engineering Vol-I, Khanna Publishers
2. G.S.Birdie,Water Supply & Sanitary Engineering-including Environmental Engineering, water And air pollution and Ecology, Dhanpat RaiandSons publishers,ISBN:81-87433-31-0
3. Dr. P.N. Modi, Environmental Engg.-Vol-I, Standard BookHouse
4. A.K.Chatterji,WaterSupply,WasteDisposalandEnvironmentalPollution Engineering, Khanna publishers

SUGGESTED LIST OF CASE STUDIES/STUDENTACTIVITIES
1. Collect the information about biotic and a biotic component of surrounding environment and frame relation among them
2. Estimatethetotalquantityofwaterrequiredforatown/locality/Institute
3. Prepare map and written report for surface and underground sources of water in the neighborhood
4. Visit nearby Certified Water testing laboratories and identify various tests conducted on water
5. Visit Water Treatment Plant and collect details of unit operations and processes involved in it.
6. Study the distribution system of water supply of your locality
7. Visit a newly constructed building and study plumbing work
8. Study a rooftop rain water harvesting system of existing building
9. Study a Solar water heating system and collect necessary data
10. Collect a necessary data/information about issues related to water pollution and Prepare report/presentation

Evaluation:
Students should select any one of the above topic in a group of 3 to 5. Students should submit a written report and make a presentation on the topic. The task should not be repeated among students. Report will be evaluated by the faculty as per rubrics defined by him/her/them at start of course.

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 Outcomes for Unit II	CO2	
Unit III	**E- Waste pollutants and Characteristics**	**02 hrs**
Digital dump yard, how to minimize e-waste, Hazardous substances waste Electrical and Electronic Equipment, characteristics of pollutants, batteries, electrical and electronic		

components, plastic and flame retardants, circuit boards, pollutants in waste electrical and electronic equipment.

Mapping of Course Outcomes for Unit III	CO3	
Unit IV	**E-Waste Recycling**	**02 hrs**

Overview of e-Waste recycling, Technologies for recovery of resources from electronic waste, resource recovery potential of e-waste, steps in recycling and recovery of materials-mechanical processing, technologies for recovery of materials

Mapping of Course Outcomes for Unit IV	CO4	
Unit V	**Environmental Pollution**	**02 hrs**

Causes and effects and control measures of: Air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution, nuclear hazards, Role of an individual in prevention of pollution, Pollution case studies: Pollution caused because of electronic waste material and measures for controlling.

Mapping of Course Outcomes for Unit V	CO5	
Unit VI	**Impact on human health and Pollution Controlling**	**02 hrs**

Impact of products from e-waste in human health, Current disposal methods of e-waste, e-waste recycling technologies and methods recycling pose a risk to environmental and human health. Safe methods for disposal of e-waste and controlling relevant pollution.

Mapping of Course Outcomes for Unit VI	CO6	

E-Resources from Learning Support
1.https://nptel.ac.in/courses/105/105/105105169/   2.https://www.ugc.ac.in/oldpdf/modelcurriculum/env.pdf
Text Books
1. E-Waste Managing the Digital Dump Yard, Edited by Vishakha Munshi,ICFAI University Press,2007.   2. Text Book of Environmental Studies for undergraduate Courses by Bharucha Erach,University Press, II- Edition 2013 Available online free edition.
Reference Books
1. E-waste: Implications, Regulations and Management in India and Current Global Best Practices, Edited by Rakesh Johri, The Energy and Resources Institute, New Delhi,2008
Evaluation:
Students should select any one of the above topic in a group of 3 to 5. Students should submit a written report and make a presentation on the topic. The task should not be repeated among students. Report will be evaluated by the faculty as per rubrics defined by him/her/them at start of course.

Savitribai Phule Pune University, Pune Second Year Information Technology (2019Course) **214459 (D): Mandatory Audit course 4 :** **Intellectual Property Rights**		
Teaching Scheme:	**Credit Scheme:**	**Examination Scheme:**
01hrs/week	**Non Credit**	**Audit Course**

Prerequisite Courses, if any: ---

Course Objectives

1. To introduce fundamental aspects of Intellectual property Rights (IPR)
2. To disseminate knowledge about types of IP like Patents, Copyrights, Trade Secrets
3. To make students aware about current trends in IPR and their importance
4. To motivate students for innovative thinking and making inventions

Course Outcomes

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

CO1: Exhibit the concepts of Intellectual Property Rights

CO2: Differentiate among different IPR

CO3: Formulate and characterize innovative ideas and inventions into IPR

CO4: Demonstrate knowledge of advances in patent law and IP regulations

COURSE CONTENTS		
Unit I	**Overview Of Intellectual Property**	**02 hrs**
Introduction and the need for intellectual property right (IPR) - Types of Intellectual Property Rights: Patent, Copyright, Trade Mark, Design, Geographical Indication, Plant Varieties and Layout Design – Genetic Resources and Traditional Knowledge – Trade Secret.		
Mapping of Course Outcomes for Unit I	**CO1, CO2**	
Unit II	**Patents**	**04 hrs**
What is invention? Patentability criteria: Novelty, Non-Obviousness (Inventive Steps), Industrial Application, Non- Patentable Subject Matter, Patent Search, Patent Registration Procedure, Rights and Duties of Patentee, Assignment and license, Infringement.		
Mapping of Course Outcomes for Unit II	**CO3, CO4**	
Unit III	**Copyrights**	**02 hrs**
Concept of Copyright –Copyright Subject matter: original literary, dramatic, musical, artistic works; cinematograph films and sound recordings - Registration Procedure, Term of protection, Ownership of copyright, Assignment and license of copyright - Infringement		
Mapping of Course Outcomes for Unit III	**CO3**	

Unit IV	Trademarks	02 hrs
Nature of Trademarks - Different kinds of trademarks (, logos, signatures, symbols, well known marks, brand names, certification and service marks) – Trademarks that can't be registered– Trademarks registration procedure - Rights of holder and assignment and licensing of marks - Infringement		
Mapping of Course Outcomes for Unit IV	CO3	
Unit V	Advances in IP Laws and Government policies	02 hrs
Amendments and India`s New National IP Policy, Promoting IPR policy for Start-ups, Career Opportunities in IP - IPR in current scenario		
Mapping of Course Outcomes for Unit V	CO4	
Text Books		
1. Niraja Pandey, Khush deep Dharni (2014), "Intellectual Property Rights", PHI 2. Nithyananda K V. (2019). Intellectual Property Rights: Protection and Management. India, IN: Cengage Learning India Private Limited		
Reference Books		
1. Mishra, "An introduction to Intellectual property Rights", Central Law Publications		
2. Ahuja, V K. (2017). Law relating to Intellectual Property Rights. India, IN: Lexis Nexis		
Evaluation:		
Students should select any one of the above topic in a group of 3 to 5. Students should submit a written report and make a presentation on the topic. The task should not be repeated among students. Report will be evaluated by the faculty as per rubrics defined by him/her/them at start of course.		

	Savitribai Phule Pune University, Pune
	Third Year Information Technology (2019 Course)
	314449 : Seminar

Teaching Scheme:	Credit Scheme:	Examination Scheme:
Practical (PR) : 01 hrs/week	**01 Credits**	**TW : 50 Marks**

Prerequisites:
1. Project Based Learning
2. Software Engineering

Course Objectives:

Seminar should make the student attain skills like:
1. To gather the literature of specific area in a focused manner.
2. To summarize the literature to find state-of-the-art in proposed area.
3. To identify scope for future work.
4. To present the case for the intended work to be done as project.
5. To report literature review and proposed work in scientific way.

Course Outcomes:

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

CO1: Understand, interpret and summarize technical literature.

CO2: Demonstrate the techniques used in the paper.

CO3: Distinguish the various techniques required to accomplish the task. CO4: Identify intended future work based on the technical review.

CO5: Prepare and present the content through various presentation tools and techniques in effective manner.

CO6: Keep audience engaged through improved interpersonal skills.

Guidelines for Seminar Selection and Presentation

1) Student shall identify the area or topics in Information Technology referring to recent trends and developments in consultation with industry (for their requirement) and institute guide.
2) Student must review sufficient literature (reference books, journal articles, conference papers, white papers, magazines, web resources etc.) in relevant area on their topic as decided.
3) Seminar topics should be based on recent trends and developments. Guide should approve the topic by thoughtfully observing different techniques, comparative analysis of the earlier algorithms used or specific tools used by various researchers in the domain.
4) Research articles could be referred from IEEE, ACM, Science direct, Springer, Elsevier, IETE,CSI orfrom freely available digital libraries like Digital Library of India (dli.ernet.in), National Science Digital Library, JRD Tata Memorial Library, citeseerx.ist.psu.edu, getcited.org, arizona.openrepository.com, Open J-Gate, Research Gate, worldwidescience.org etc.
5) Student shall present the study as individual seminars in 20 – 25 minutes in English which is followed by Question Answer session.
6) Guide should ensure that students are doing literature survey and review in proper manner.
7) Guide should give appropriate instructions for effective presentation.
8) Attendance of all other students in the class for presentation is mandatory.
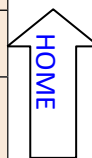
Timeline is suggested to follow throughout the semester:

1) **Week– 01:** Discussion to understand what is technical paper, how to search, where to search?
2) **Week– 02:** Download technical papers (minimum four), getting approved from Guide and Prepare abstract summary of all papers downloaded.
3) **Week– 03 & 04:** Read and understand in detail the decided research papers about the problem statement, techniques used, experimental details and results with conclusion from identified papers.
4) **Week– 05:** Review of the studied papers by Guide / Panel.
5) **Week – 06 & 07:** Search / Find equivalent techniques (other than the one proposed in technical paper) so performance / complexities can be improved (by amortized analysis, not actual implementation).
6) **Week – 08 & 09:** Prepare presentation with outline as The topic, its significance, The research problem, Studied solutions (through research papers) with strengths and weaknesses of each solution, comparison of the solutions to research problem, future directions of work, probable problem statement of project, tentative plan of project work
7) **Week – 10:** Write Seminar report.
8) **Week – 11:** Deliver Presentation to Guide/ Panel.
9) **Week –12:** Verification of Seminar report and Submission.

Guidelines for Seminar report

1. Each student shall submit two copies of the seminar report in appropriate text editing tool/software as per prescribed format duly signed by the guide and Head of the department/Principal.
2. Broad contents of review report (20-25 pages) shall be
    a) Title Page with Title of the topic, Name of the candidate with Exam Seat Number / Roll Number, Name of the Guide, Name of the Department, Institution, Year & University.
    b) Seminar Approval Sheet/Certificate.
    c) Abstract and Keywords.
    d) Acknowledgments.
    e) Table of Contents, List of Figures, List of Tables and Nomenclature.
    f) Chapters need to cover topic of discussion-
        i. Introduction with section including organization of the report,
        ii. Literature Survey
        iii. Motivation, purpose and scope and objective of seminar
        iv. Details of design/technology/Analytical and/or experimental work, if any/
        v. Discussions and Conclusions,
        vi. Bibliography/References (in IEEE Format),
        vii. Plagiarism Check report,
3. Students are expected to use open source tools for writing seminar report, citing the references and plagiarism detection.
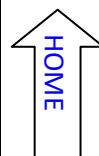
Guidelines for Lab /TW Assessment:

1. A panel of reviewers constituted by seminar coordinator (where guide is one of the member of the panel) will assess the seminar during the presentation.
2. Student's attendance for all seminars is advisable.
3. Rubric for evaluation of seminar activity:
   i.   Relevance of topic   -   05 Marks
   ii. Relevance + depth of literature reviewed - 10 Marks
   iii. Seminar report (Technical Content)   - 10 Marks
   iv. Seminar report (Language)   -   05 Marks
   v.   Presentation Slides   -   05 Marks
   vi. Presentation & Communication Skills   -   05 Marks
   vii. Question and Answers   -   10 Marks
   TOTAL: **50 Marks**

Reference Book:

1. Andrea J. Rutherfoord, Basic Communication Skills for Technology, Pearson Education Asia, 2ndEdition.
2. Lesikar, Lesikar's Basic Business Communication, Tata McGraw, ISBN: 256083274, 1st Edition.

Text Book :

1. Sharon J. Gerson, Steven M. Gerson, Technical Writing: Process and Product, Pearson Education Asia, ISBN: 130981745, 4thEdition.

Savitribai Phule Pune University, Pune
Third Year Information Technology (2019 Course)
Mandatory Audit Course 5
314450 (A): Banking and Insurance

Teaching Scheme:	Credit Scheme:	Examination Scheme:
Theory (TH) : 1 hrs/week	**No Credits**	Audit Course

Prerequisite Courses : If any

Course Objectives: -

1. To understand banking system in India.

2. To understand negotiable instruments.

3. To learn attributes of different types of insurance policies.

4. To create awareness about nature and functioning of annuities.

Course Outcomes: -

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

CO1: Differentiate between types of banks and their working.

CO2: Carry out banking transactions on their own.

CO3: Decide which insurance policy they should buy.

CO4: Handle investing in annuities and claim settlements.

COURSE CONTENTS

Unit I	INTRODUCTION TO BANKING	(03 hrs)

Definition of Bank - Basic functions of Banker

Banking System in India : Banker and Customer: Relationship between Banker and Customer, Special Types of Customers, Retail & Wholesale Banking, Deposit Accounts – Savings Accounts, Current Accounts, Fixed Deposit Accounts, Opening and operation of Accounts, Nomination, KYC requirements, Pass Book, Minors, Partnerships & Companies.

Mapping of Course Outcomes for Unit I	CO1

Unit II	BANK FUNDS AND INSTRUMENTS	(03 hrs)

Employment of Bank Funds: Liquid Assets-Cash in Hand, Cash with RBI & Cash with other Banks, Investment in securities, Advances - Secured and Unsecured, Loans, Term Loans, Cash Credit, Overdraft, Discounting of Bills of Exchange, Modes of creating charge on Securities, Types of Securities.

Negotiable Instruments: Definition & Characteristics of Cheques, Bills of Exchange & Promissory Notes, Crossings, Endorsements, Collection and payment of Cheques, Liabilities of Parties.

Mapping of Course Outcomes for Unit II	CO2	
Unit III	**INTRODUCTION TO INSURANCE**	**(03 hrs)**

Concept of Insurance, Need for Insurance.

Brief history of Insurance industry in India: (a) Enactment of Insurance Act, 1938. (b) Nationalization of Life Insurance Companies in 1955. (c) Nationalization of General insurance Companies in 1972. (d) Malhotra Committee Report – Opening up of Insurance sector to Private Companies in 2000. (e) Setting up o Insurance Regulatory and Development Authority in 1999.

Life Insurance: Present Organizational set-up of Insurance Companies in India – L.I.C. and Private Companies with foreign joint ventures, selling Insurance through Agents and Banks.

Objectives of Life Insurance – Protection and Investment, Different types of Life Insurance Policies – Chief characteristics and similarity. Online vs Offline policies

Basic Pre-requites for Life Insurance – Insurable Interest and utmost Good Faith.

Procedure for taking a policy: (a) Selection of the Plan. (b) Consultation of Premium tables. (c) Filling up of Proposal Form. (d) Document regarding proof of age. (e) Important clauses of the Policy – eg. Suicide Clause. (f) Nomination

Mapping of Course Outcomes for Unit III	CO3	
Unit IV	**ULIPs AND POLICY MATTERS**	**(03hrs)**

Annuities and Unit Linked Policies: Concept of Annuity, Objectives of Annuity, Procedure followed for obtaining Annuities, Meaning of Unit Linked Insurance Policies, Procedure for obtaining Unit linked insurance Policies.

General Insurance: General Insurance companies, types of general insurance

Post - Issue Matters: Lapse of the Policy due to Non-Payment of Premium, Revival of the Lapsed Policies, Surrender of the Policy – Payment of surrender value, Assignment of the Policies, Settlement of claims – Procedure to be followed.

Mapping of Course Outcomes for Unit IV	CO4	
Text Books:		

1. Sunil Kumar, Essentials of Banking and Insurance, JSR PUBLISHING HOUSE LLP; 2ndEd edition, ISBN-10 :938768461X.
2. D.D. Chaturvedi, Arun Mittal, Saumya Chaturvedi, Banking and Insurance, Scholar Tech Press, ASIN : B08S3H36K1

E- Books / E- Learning References:
1. https://onlinecourses.swayam2.ac.in/cec21_ge04/preview

<div align="right"></div>

Savitribai Phule Pune University, Pune

Third Year Information Technology (2019 Course)

Mandatory Audit Course 5

314450 (B): Startup Ecosystems

Teaching Scheme:	Credit Scheme:	Examination Scheme:
Theory (TH) : 1 hrs/week	**No Credits**	**Audit Course**

Prerequisite Courses: NA

Course Objectives:

To familiarize students-

1. New venture creation opportunities, its resources, and requirements for Enterprise Startup

2. Legal requirements for new ventures

3. Financial issues and strategies related to startups

Course Outcomes:

completion of the course, students will be able to–

CO1: Identify Startup opportunities

CO2: Explain legal and other requirements for new ventures

CO3: Analyze financial Issues of startups

COURSE CONTENTS		
Unit I	**STARTUP OPPORTUNITIES**	**(04 hrs)**

Current industrial revolution, Idea Generation with brainstorming, Business Startup, ideation, choices of venture, the rise of Startup economy, forces of change, startup equation, the entrepreneurial ecosystem, Indian government initiatives, Entrepreneurship in India, Case Study: MEITY Startup Hub

Mapping of Course Outcomes for Unit I	CO1

Unit II	**STARTUP ECOSYSTEM**	**(04 hrs)**

Startups ecosystem: Support organizations, big companies, universities, funding organizations, service providers, research organizations, Startup development phases: Ideating, conception, committing, validating, scaling, establishing, Startup business partnering, Startup culture, Co-founders, FFF (Fools, friends and family), Angels

Mapping of Course Outcomes for Unit II	CO2

Unit III	**STARTUP CAPITAL REQUIREMENTS AND LEGAL ENVIRONMENT**	**(04 hrs)**

Identification of capital resource requirements of startup, estimating startup finance requirements, deciding a process map, Positioning the venture in the value chain – Framing risk reduction strategy, Startup financing metrics, Legal perspectives- New Ventures approval procedures- Taxes or duties payable for new ventures, Case Study: Technology Incubation and Development of Entrepreneurs (TIDE)

Mapping of Course Outcomes for Unit III	CO3

Text Books:
1. Kathleen R Allen, "Launching New Ventures, An Entrepreneurial Approach", Cengage Learning, 2016.   2. Anjan Raichaudhuri, Managing New Ventures Concepts and Cases, Prentice Hall International, 2010.   3. S.R. Bhowmik and M. Bhowmik, Entrepreneurship, New Age International, 2007.   4. Steven Fisher, Ja-nae Duane, The Startup Equation -A Visual Guidebook for Building Your Startup, Indian Edition, Mc Graw Hill Education India Pvt. Ltd, 2016.
Reference Books:
1. Donald F Kuratko, Jeffrey S. Hornsby, New Venture Management: The Entrepreneurs Road Map, 2e, Routledge, 2017.   2. Vijay Sathe, Corporate Entrepreneurship, 1e, Cambride, 2009.   3. Bruce R. Barringer, R.Duane Ireland, Entrepreneurship successfully, launching new ventures.Pearson,2019

Savitribai Phule Pune University, Pune		
Third Year Information Technology (2019 Course)		
314455: Internship		
Teaching Scheme:	**Credit Scheme:**	**Examination Scheme:**
Theory (TH) : 4 hrs/week	**04 Credit**	**Team work: 100 Marks**

HOME

Prerequisite Courses: if Any

Course Objectives:

● To encourage and provide opportunities for students to get professional/personal experience through internships.
● To learn and apply the technical knowledge gained from academics /classroom learning in real life/industrial situations.
● To get familiar with various tools and technologies used in industries and their applications.
● To enable students to develop professional skills and expand their professional network with the development of employer-valued skills like teamwork, communication.
● To apply the experience gained from industrial internship to the academic course completion project.
● To nurture professional and societal ethics in students
● Understand the social, economic and administrative considerations that influence the working environment of industrial organizations

Course Outcomes:

On completion of the internship, learner will be able to –
CO1: Develop professional competence through industry internship.
CO2: Apply academic knowledge in a personal and professional environment
CO3: Build the professional network and expose students to future employees.
CO4: Apply professional and societal ethics in their day-to-day life.
CO5: Become a responsible professional having social, economic and administrative considerations.
CO6: Make own career goals and personal aspirations.

Guidelines:

Internships are educational and career development opportunities, providing practical experience in a field or discipline. Internships are far more important as the employers are looking for employees who are properly skilled and having awareness about industry environment, practices and culture. Internship is structured, short- term, supervised training often focused around particular tasks or projects with defined time scales.

Core objective is to expose technical students to the industrial environment, which cannot be simulated/experienced in the classroom and hence creating competent professionals in the industry and to understand the social, economic and administrative considerations that influence the working environment of industrial organizations.

Engineering internships are intended to provide students with an opportunity to apply theoretical knowledge from academics to the realities of the field work/training. The following guidelines are proposed to give academic credit for the internship undergone as a part of the Third Year Engineering curriculum.

Duration:
Internship to be completed after semester 5 and before commencement of semester 6 of at least 4 to 6 weeks; and it is to be assessed and evaluated in semester 6.
Internship work Identification:

Student may choose to undergo Internship at Industry/Govt./NGO/MSME/Rural Internship/ Innovation/IPR/Entrepreneurship. Student may choose either to work on innovation or entrepreneurial activities resulting in start-up or undergo internship with industry/NGO's/Government organizations/Micro/Small/ Medium enterprises to makethemselves ready for the industry.

Contacting various companies for Internship and Internship work identification process should be initiated in the Vth semester in coordination with training and placement cell/ industry institute cell/ internship cell. This will help students to start their internship work on time. Also, it will allow students to work in vacation period after their Vth semester examination.

Student can take internship work in the form of Online/onsite work from any of the following but not limited to:

- Working for consultancy/ research project,
- Participation at Events (Technical / Business)/in innovation related completions like Hackathon,
- Contribution in Incubation/ Innovation/ Entrepreneurship Cell/ Institutional Innovation Council/ startups cells of institute /
- Learning at Departmental Lab/Tinkering Lab/ Institutional workshop,
- Development of new product/ Business Plan/ registration of start-up,
- Participation in IPR workshop/Leadership Talks/ Idea/ Design/ Innovation/ Business Completion/ Technical Expos,
- Industry / Government Organization Internship,
- Internship through Internshala,
- In-house product development, intercollegiate, inter department research internship under research lab/group, micro/small/medium enterprise/onle ineinternship,
- Research internship under professors, IISC, IIT's, Research organizations,
- NGOs or Social Internships, rural internship,
- Participate in open source development.

Internship Diary/ Internship Workbook:

Students must maintain Internship Diary/ Internship Workbook. The main purpose of maintaining diary/workbook is to cultivate the habit of documenting. The students should record in the daily training diary the day-to-day account of the observations, impressions, information gathered and suggestions given, if any. The training diary/workbook should be signed after every day by the supervisor/ in charge of the section where the student has been working.

Internship Diary/workbook and Internship Report should be submitted by the students along with attendance record and an evaluation sheet duly signed and stamped by the industry to the Institute immediately after the completion of the training. Internship Diary/workbook may be evaluated on the basis of the following criteria:

- Proper and timely documented entries
- Adequacy & quality of information recorded
- Data recorded
- Thought process and recording techniques used
- Organization of the information

Internship Work Evaluation:
Every student is required to prepare a maintain documentary proofs of the activities done by him as internship diary or as workbook. The evaluation of these activities will be done by Programme Head/Cell In-charge/ Project Head/ faculty mentor /faculty or Industry Supervisor based on- Overall compilation of internship activities, sub-activities, the level of achievement expected, evidence needed to assign the points and the duration for certain activities. Assessment and Evaluation is to be done in consultation with internship supervisor (Internal and External – a supervisor from place of internship.
Recommended evaluation parameters-Post Internship Internal Evaluation -50 Marks +Internship Diary/Workbook and Internship Report - 50 Marks
Evaluation through Seminar Presentation/Viva-Voce at the Institute-
The student will give a seminar based on his training report, before an expert committee constituted by the concerned department as per norms of the institute. The evaluation will be based on the following criteria: • Depth of knowledge and skills Communication & Presentation Skills   • Team Work   • Creativity   • Planning & Organizational skills   • Adaptability   • Analytical Skills   • Attitude & Behavior at work

- Societal Understanding
- Ethics
- Regularity and punctuality
- Attendance record
- Log book
- Student's Feedback from External Internship Supervisor

After completion of Internship, the student should prepare a comprehensive report to indicate what he/she has observed and learnt in the training period. The student may contactIndustrial Supervisor/ Faculty Mentor/Faculty/TPO for assigning special topics and problems and should prepare the final report on the student's presence physically, if the student is found absent without prior intimation to the department/institute/concern authority/T & P Cell, entire training can be cancelled.

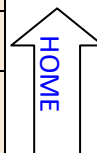The report shall be presented covering following recommended fields but limited to,

- Title/Cover Page
- Internship completion certificate
- Internship Place Details- Company background-organization and activities/Scope and object of the study / personal observations
- Index/Table of Contents
- Introduction
  Title/Problem statement/objectives Motivation/Scope and rationale of the study Methodological details
  Results / Analysis /inferences and conclusion
  Suggestions / Recommendations for improvement to industry, if any Attendance Record
  Acknowledgement
  List of reference (Library books, magazines and other sources)

Feedback from internship supervisor(External and Internal)

Post internship, faculty/faculty coordinator should collect feedback about student with following recommended parameters-

Technical knowledge, Discipline, Punctuality, Commitment, Willingness to do the work, Communication skill, individual work, Team work, Leadership.

	Savitribai Phule Pune University, Pune

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 **Tutorial(TUT): 3 hrs/week** **(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)**

Solar energy: Introduction, Conservation of Solar energy

Applications: Solar Energy - solar water heater- Solar Cooker-Box type- Solar dryer-solar green house—Summer and winter greenhouse-solar electric power generation-Solar photovoltaic

Wind Energy: Introduction- Basic Principles of Wind energy conversion-The nature of wind- The power inthe wind. Wind energy conversion system (WECS), Advantages & Limitations of WECS , Environmental aspect. Government Schemes.

Mapping of Course Outcomes for Unit II	CO2, CO3	
Unit III	**BIOMASS ENERGY, GEO THERMAL & TIDAL ENERGY.**	**(04 hrs)**

Biomass Energy: Introduction- Biomass conversion techniques -Biogas Generation-Factors affecting biogas Generation, urban waste to energy conversion.

Geothermal Sources: Hydro thermal Source (Vapor &Liquid dominated systems), geothermalenergy conversion

Tidal Energy-Basic Principles of Tidal Power, Schematic Layout of Tidal Power house, Advantages & Limitations of Tidal power.

Mapping of Course Outcomes for Unit III	CO3, CO4

Guidelines for Conduction (Any one or more of following but not limited to)
Guest Lectures / Group Activities / Assignments / Taking up small project for short duration Guidelines for Assessment (Any one or more of following but not limited to) / Practical Test / Presentation / Paper / (Theory assessment test) / Report

SUGGESTED LIST OF STUDENT ACTIVITYS
1. Prepare a of monthly energy consumption of your institute and find the ways how it can be conserved 2. Conduct an energy audit of your institute; suggest the ways how the conventional energy resources utilization can be minimized. Suggest the areas ,where the non-conventional energy may be used 3. Visit solar power plant /wind power plant available in your locality/ nearer to your institute and understand different elements, working, and note the power generation by these plants 4. Visit government website for renewable energy and find out different schemes run by government.

Text Books:
1. Non-Conventional Energy Sources by G.D. Rai, Khanna Publication 2. Renewable Energy (2nd edition). Oxford University Press, 450 pages (ISBN: 0-19- 926178-4). 3. Renewable Energy Sources & Emerging Technologies, D P Kothari, K C Singal & Rakesh Ranjan, Prentice Hall India.

Reference Books:
1. http://www.ener-supply.eu/downloads/ENER_handbook_en.pdf 2. Energy opportunities and social responsibility. Satyesh C. Chakraborty, Jaico publications 3. Energy Systems and Sustainability: Power for a Sustainable Future. Oxford University Press, 619 pages (ISBN: 0-19-926179-2) 4. Ashok Desai V, Non-Conventional Energy, Wiley Eastern Ltd, 1990. 5. Mittal K.M, Non-Conventional Energy Systems, Wheeler Publishing Co. Ltd, 1997.

E- Books / E- Learning References :
1. RENEWABLE ENERGY SOURCES AND THEIR APPLICATIONS: http://www.ifeed.org/pdf/media/BOOK_Renewable-Energy-Sources-and-their-Applications.pdf 2. http://nptel.ac.in/courses/112105051/

Savitribai Phule Pune University, Pune		
Third Year Information Technology (2019 Course)		
Mandatory Audit Course 6		
314459 (B): Leadership and Personality Development		
Teaching Scheme:	**Credit Scheme:**	**Examination Scheme:**
Theory (TH) :1 hrs/week **Tutorial(TUT): 3 hrs/week** **(Assignments and Self-study)**	**Non Credit**	**Audit Course**

Prerequisite Courses: if Any

Course Objectives:

1. To develop inter personal skills and be an effective goal oriented leader.
2. To develop personalities of students in order to empower them and get better insights into self-responsibilities in personal life to build better human being.
3. To develop professionals with leadership quality along with idealistic, practical and moral values.
4. To re-engineer attitude and understand its influence on behavior.
5. To help students to evolve as leaders who can effectively handle real life challenges in and across the dynamic environment.

Course Outcomes:

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

CO1: Practice responsible decision-making and personal accountability.

CO2: Demonstrate an understanding of group dynamics and effective teamwork.

CO3: Develop a range of leadership skills and abilities such as effectively leading change, resolving conflict, and motivating others.

CO4: Develop multi-dimensional personality.

COURSE CONTENTS		
Unit I	**PERSONALITY DEVELOPMENT**	**(03 hrs)**

Laws of Personality Development, Different Layers of Personality, How to Change Our Character, Influence of Thought, Take the Whole Responsibility on Yourself, Self-analysis: Johari 's Window, Attitude: Factors influencing Attitude, Challenges and lessons from Attitude, Personality Traits, Sharpening MemorySkills, Decision-Making, Negotiation and Problem-Solving. Importance of Self

Confidence, Self Esteem, Creativity: Out of box thinking, Lateral Thinking

Mapping of Course Outcomes for Unit I	CO1

Unit II	**TECHNIQUES IN PERSONALITY DEVELOPMENT**	**(03 hrs)**

Techniques for better Time Management, Meditation and concentration techniques, Self- hypnotism, Self-acceptance, and self-growth, Goal setting: Wish List, SMART Goals, Blueprint for success, Short Term, Long Term, Lifetime Goals. Confidence Building: Case studies, Confidence

building videos of motivational speakers.

Mapping of Course Outcomes for Unit II	CO1, CO2	
Unit III	**LEADERSHIP SKILLS**	**(03 hrs)**
Working individually and in a team, Levels of Leadership, Making of a leader, Types of leadership, Transactions Vs Transformational Leadership, VUCA Leaders, DART Leadership, Leadership Grid & leadership Formulation, Introduction to Interpersonal Relations, Virtual Leadership: Introduction, Essential Skills for Managing Remote Teams and challenges of virtual leadership.		
Mapping of Course Outcomes for Unit III	CO3, CO4	
Unit IV	**TEAM BUILDING**	**(03 hrs)**
Importance of groups in organization and Team Interactions in group, Group Vs Teams, Team formation process, Stages of Group, Group Dynamics, Managing Team Performance & Team Conflicts., How to build a good team? Teamwork & Team building Interpersonal skills, Virtual team dynamics: issues and resolutions		
Mapping of Course Outcomesfor Unit IV	**CO2 ,CO4**	

Reference Books:

1. Barun K. Mitra; (2011), "Personality Development & Soft Skills", First Edition; OxfordPublishers.2E, ISBN: 780199459742, ISBN: 0199459746.
2. SKILLS, 2015, Career Development Centre, Green Pearl Publications.
3. ShaliniVerma (2014); "Development of Life Skills and Professional Practice"; First Edition; Sultan Chand (G/L) & Company. ISBN: 9789325974203, ISBN: 9325974207.
4. John C. Maxwell (2014); "The 5 Levels of Leadership", Centre Street, A division of Hachette Book Group Inc, ISBN: 9789350098714, ISBN: 9350098717.
5. Basic Managerial Skills for All by E. H. McGrath, S. J., PHI Personality Development and Soft Skill, Mitra, Barun, Oxford University Press, ISBN: 9788120343146, ISBN:812034314X.
6. Personality Development by Rajiv K. Mishra. Rupa& Co.
7. How to deal with Stress by Stephen Palmer & Cary Cooper, Kogan Page India Pvt. Ltd., South Asian Edition Successful Time Management by Patrick Forsyth, Kogan Page
8. Shiv Khera, "You Can Win", A&C Black, 2014, ISBN: 13: 9789350593783
9. Gajendra Singh Chauhan, Sangeeta Sharma: Soft Skills – An Integrated Approach to Maximize Personality, Wiley India, ISBN:13:9788126556397

E-Books/E-Learning References:

1. Developing Soft Skills and Personality: By Prof.T.Ravichandran, IIT Kanpur https://onlinecourses.nptel.ac.in/noc19_hs32/preview
2. Leadership:Prof KalyanChakravatti, IIT Kharagpur https://nptel.ac.in/courses/122/105/122105021/
3. Virtual leadership https://youtu.be/SNeTzgBE93o
4. Motivation and Confidence building videos of motivational speakers like Shiv Khera, Sandeep Maheshwari , Sonu Sharma , Vivek Bindra , B.K.Shivani

Savitribai Phule Pune University, Pune Final Year Information Technology (2019 Course) **414448: Project Stage I**		
Teaching Scheme:	**Credit Scheme:**	**Examination Scheme:**
Tutorial (TUT): 02 hrs/week	**02 Credits**	**Term Work: 50 Marks**

Prerequisite Courses, if any: PBL, Seminar, Basic Knowledge of Latest Technologies in IT.

Companion Course, if any: NOT APPLICABLE

Course Objectives:

1. To build up their practical experience with implementation and hence develops self-confidence.
2. To generate the opportunities to experience practically the facts learned in various fields together.
3. To improve overall communication skill, Teamwork and Leadership Qualities, professionalism.
4. To apply the knowledge for solving realistic problems.
5. To evaluate alternative approaches and justify the use of selected tools and methods.

Course Outcomes:

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

CO1. To apply knowledge of mathematics, science, and engineering to formulate the Problem statement.

CO2. To design and conduct experiments, as well as to analyze and interpret data.

CO3. Understand the professional and ethical responsibility.

CO4. To communicate effectively.

CO5. Get broad education which is necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.

CO6. Recognition of the need for, and an ability to engage in life-long learning.

CO7. To use the techniques, skills, and modern engineering tools necessary for engineering practices.

CO8. To design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.

Introductory Information:

BE Project can be application oriented and/or will be based on some innovative work in recent technologies like IoT, Cloud Computing, Web Technologies, Bio-inspired Algorithms, Artificial Intelligence, Machine Learning, Natural Language Processing, Theoretical Computer Science fundamentals. In Project Phase-I the student will undertake project over the academic year, which will involve the analysis, design of a system or sub system in the area identified earlier in the field of Information Technology and Computer Science and Engineering. The project will be undertaken preferably by a group of 3-4 students who will jointly work and implement the project. The group will select a project based on their internship or Guide can suggest based on recent technologies / Industrial Applications.

Guidelines to Faculty and Students:

1) The Head of the department / Project coordinator shall constitute a review committee (preferably same committee needs to carry throughout the year) for project group; project guide would be one member of that committee by default.
2) For sponsored projects, an employee of the sponsoring organization may be one of the member of review committee.
3) There shall be **TWO** reviews in Project phase –I (in semester-I) by the review committee.
4) The Project Review committee will be responsible for evaluating the timely progress of the projects. It is suggested to evaluate the skills learned by the students in their PBL (in their previous years).
5) Student should identify project of enough complexity, which has at least 4-5 major functionalities.
6) Student should adopt skills learned in Software Engineering / Software Architecture to identify stakeholders, actors, Architectural Styles etc... and write detail problem statement for the system.
7) Review committee should finalize the scope of the project.
8) If change in project topic is unavoidable then the students should complete the process of Project approval by submitting synopsis along with the review of important papers which should be approved by review committee.
9) Every student of the project group shall make presentation on the progress made by them before the committee during each review. Each student/group is required to give presentation as part of review for 10 to 15 minutes followed by a detailed discussion and query session.
10) Students need to note down the queries raised during review(s) and comply the same in the next review session.
11) The record of the remarks/suggestions of the review committee (project dairy) should be properly maintained and should be made available at the time of university examination.
12) Project group needs to present / publish TWO papers (One in each semester, at least one paper should be in **UGC – Care journal**).
    a) Paper must be checked for Plagiarism by any open software.
    b) One paper during first semester which includes Literature Survey and Detailed design components of the Project Statement.
    c) One paper during second semester which includes Methodologies / Algorithms implemented, Results obtained, Analysis of results and conclusion.
13) Project report must also be checked for Plagiarism.
14) The examinee will be assessed by a panel of examiners of which one is necessarily an external examiner. The assessment will be broadly based on work undergone, content delivery, presentation skills, documentation, question-answers, and report.

Review 1: Synopsis –

Points to be covered:

1) The precise problem statement/title based on literature survey and feasibility study.
2) Motivation, objectives, and scope of the project.
3) List of required hardware, software, or other equipment for executing the project, test Environment/tools, cost and software measurement/human efforts in hours.
4) System overview- proposed system and expected outcomes.
5) Architecture and initial phase of design (DFD).

Review 2: Requirement and Design Specification

Points to be covered:

1) User and System Requirements.
2) Functional and Non-functional Requirements.
3) SRS Document, Writing structures SRS as per Problem Statement.
4) Requirement Analysis / Models.
5) UML/ER Diagrams.
6) Detail architecture / System design/ Algorithms with analysis / Methods / Techniques.
7) Need to discuss Design models and Component level designs.
8) Detailed Design (DFD levels as per the problem statement).
9) At least 30-40% coding documentation with at least 3 to 4 working modules.
10) Identification of test to be essential and appropriate (to be implement later).
11) Project plan.

Evaluation Criteria:

Following criteria and weightage is suggested for evaluation of Project-Phase I Term Work.

1) Originality of Problem Statement: 10% (05 Marks)
2) Depth of Understanding the Problem Statement: 10% (05 Marks)
3) Concreate Literature Survey with identified gaps in all referred papers: 10% (05 Marks)
4) Design and Analysis of Algorithm / Model / Architecture / System: 40% (20 Marks)
5) Representation of results using suitable tools like tabulation, graph etc: 10% (05 Marks)
6) Presentation Skill: 10% (05 Marks)
7) Report preparation and Paper publication: 10% (05 Marks)

Project report contains the details as Follows:

Project report must have:

    i. Certificate from the institute
    ii. Certificate sponsoring organization (If any)
    iii. Acknowledgement
    iv. Abstract
    v. Contents
    vi. List of Abbreviations (As applicable)
    vii. List of Figures (As applicable)
    viii. List of Graphs (As applicable)
    ix. List of Tables (As applicable)

      1. Introduction and aims/motivation and objectives.
      2. Literature Survey (with proper citation).
      3. Problem Statement/definition.
      4. Software Requirement Specification (In SRS Documentation only).
      5. Flowchart
      6. Project Requirement specification.
      7. Proposed system Architecture.
      8. High level design of the project (DFD,UML, ER Diagrams).
      9. System implementation-code documentation: Algorithm style, Description of detailed methodologies, protocols used etc..as applicable.
      10. Test cases.
      11. Proposed GUI/Working modules/Experimental Results (Module wise if available) in suitable format.
      12. Project Plan.
      13. Conclusions.
      14. Bibliography in IEEE format.

  Appendices:
    A. Plagiarism Report of Paper and Project report from any open-source tool.
    B. Base Paper(s) [If any].
    C. Tools used / Hardware Components specifications [If any].
    D. Published Papers and Certificates.

Use appropriate plagiarism tools, reference managers, Latex for efficient and effective project writing.

Reference Books:

  1. UML2 Bible by Tom Pender, Wiley India Pvt. Limited 2011
  2. Applying UML and Patterns Second Edition by Craig Larman, Pearson Education
  3. UML 2 and the Unified Process, Second Edition, JIM Arlow, Ila Neustadt, Pearson
  4. Design Patterns: Elements of Reusable Object-Oriented Software, Erich Gamma, Pearson
  5. Design Patterns in Java Second Edition by Steven John Metsker, Pearson

All the assignments should be conducted on Latest version of Open-Source Operating Systems, tools and Multi-core CPU supporting Virtualization and Multi-Threading

Savitribai Phule Pune University, Pune **B.E Information Technology (2019 Course)** **414449A: Audit Course 7** **Copyrights and Patents**		
Teaching Scheme:	**Credit Scheme:**	**Examination Scheme:**
Theory(TH): 01 hrs/week	**Non-Credit**	**Audit Course**

Prerequisite Courses, if any:

Course Objectives:
1. To introduce fundamental aspects of Intellectual Property Rights (IPR)
2. To study the awareness about Copyrights, Trademark and Trade Secrets.

Course Outcomes:

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

CO1. Understand the concepts of Intellectual Property Rights.

CO2. Understand the knowledge about Copyrights and Trademark.

CO3. Understand the knowledge how to protect trade secrets.

COURSE CONTENTS		
Unit I	**Introduction to Intellectual Property Law**	**(03 hrs)**
The Evolutionary Past - The IPR Tool Kit- Para -Legal Tasks in Intellectual Property Law – Ethical obligations in Para Legal Tasks in Intellectual Property Law. Introduction to Cyber Law – Innovations and Inventions Trade related Intellectual Property Right		
Mapping of Course Outcomes for Unit I	**CO1**	
Unit II	**Trademark**	**(03 hrs)**
Trademark Registration Process – Post registration Procedures – Trade mark maintenance - Transfer of Rights - Inter partes Proceeding – Infringement - Dilution Ownership of Trade mark – Likelihood of confusion - Trademarks claims – Trademarks Litigations – International Trademark Laws.		
Mapping of Course Outcomes for Unit II	**CO2**	
Unit III	**Copyrights**	**(03 hrs)**
Principles of Copyright Principles -The Subjects Matter of Copy right – The Rights Afforded by Copyright Law – Copy right Ownership, Transfer, and duration – Right to prepare Derivative works – Rights of Distribution – Rights of Perform the work Publicity Copyright Formalities and Registrations - Limitations - Copyright disputes and International Copyright Law – Semiconductor Chip Protection Act		
Mapping of Course Outcomes for Unit III	**CO3**	
Unit IV	**Introduction to Trade Secret**	**(03 hrs)**

Maintaining Trade Secret – Physical Security – Employee Limitation - Employee confidentiality agreement - Trade Secret Law - Unfair Competition – Trade Secret Litigation – Breach of Contract – Applying State Law	
Mapping of Course Outcomes for Unit IV	**CO4**

Textbooks:
1) DebiragE.Bouchoux: "Intellectual Property". Cengage learning, New Delhi   **2)** M.Ashok Kumar and Mohd.Iqbal Ali: "Intellectual Property Right" Serials Pub.   **3)** Cyber Law. Texts & Cases, South-Western's Special Topics Collections   **4)** Prabhuddha Ganguli: 'Intellectual Property Rights" Tata Mc-Graw –Hill, New Delhi   **5)** https://nptel.ac.in/courses/109105112
Evaluation
Students should select any one of the topics in a group of 3 to 5. Students should submit a written Report. Make a presentation on the topic. Report will be evaluated by the faculty as per rubrics defined by them at start of course.

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–

- **CO1.** Understand the reasons for Stress.
- **CO2.** Understand the role of Yoga.
- **CO3.** Develop healthy mind in a healthy body.
- **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. 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	

1. Textbooks:
2. 'Yogic Asanas for Group Tarining-Part-I": Janardan Swami Yogabhyasi Mandal, Nagpur **3.** "Rajayoga or conquering the Internal Nature" by Swami Vivekananda, Advaita Ashrama (PublicationDepartment), Kolkata **4.** Iyengar, BKS., (2003). The Art of Yoga. New Delhi: Harper Collins Publishers. **5.** Ravishankar.N.S., (2001). Yoga for Health. New Delhi: Pustak Mahal. **6.** https://nptel.ac.in/courses/121105009 **7.** https://onlinecourses.swayam2.ac.in/aic19_ed29/
Evaluation
Students should select any one of the topics in a group of 3 to 5. Students should submit a written Report. Make a presentation on the topic. Report will be evaluated by the faculty as per rubrics defined by them at start of course.

Savitribai Phule Pune University, Pune **Final Year Information Technology (2019 Course)** **414453: Startup and Entrepreneurship**		
Teaching Scheme:	**Credit Scheme:**	**Examination Scheme:**
Tutorial (TUT) : 03 hrs/week	**03 Credits**	**TW: 50 Marks**

Prerequisite Courses, if any:

Course Objectives:

1. To encourage students to build new technology, knowledge system based on innovations and can address local challenges.
2. Creating environment to innovate and build products towards sustainable development goals.
3. To provide platform for speedy communication and market reach of technology/ product developed by students.
4. To have start up ecosystem by bridging the gap between academia, industries and financial institutions, government support

Course Outcomes:

On Completion of Course students will be be able to:-

1. able to understand key concepts and framework of innovation and start-up ecosystem.
2. gain knowledge of how to develop start up ecosystem, its key components and how to influence and manage dynamics between them and increase the productivity of ecosystem.
3. understand the role of different stakeholders in ecosystem in building and supporting growth of start-ups.
4. have insight into global trend in start-up ecosystem and product development.
5. mapping different start-up ecosystems and developing performance indicators.

COURSE CONTENTS		
Unit I	**Start-up Opportunity**	**(3 hrs)**
Identify business opportunity with problem identification, market size, existing pains for customers, existing alternatives, customer psychology, willingness to pay, customer segments.		
Mapping of Course Outcomes for Unit I	CO1	
Unit II	**Product/ Service Proposal**	**(3 hrs)**
Value Proposition Canvas, problem-solution fit, brainstorming, competition analysis, creating competitive advantage, sustainable differentiation.		
Mapping of Course Outcomes for Unit II	CO2	
Unit III	**Business model**	**(3 hrs)**
Types, Lean canvas, Risky assumptions related to product, market, business, and execution capabilities		
Mapping of Course Outcomes for Unit III	CO3	

Unit IV	Minimum Viable Product (MVP)	(3 hrs)
Create and iterate, testing of MVP, customer feedback, validate risky assumptions, solution-market fit		
Mapping of Course Outcomes for Unit IV	CO4	
Unit V	Financial Plan	(3 hrs)
Manpower, Sales, Expenses, profitability projections, reality check, Funding plan, Pitch deck		
Mapping of Course Outcomes for Unit V	CO5	
Unit VI	Marketing strategy	(3 hrs)
Importance of brand and branding strategy, positioning, market penetration strategy/ plan, digital marketing, use of social media, customer acquisition Use of technology: for business scalability, effective execution, growth plan		
Mapping of Course Outcomes for Unit VI	CO6	
E Books / E Learning References:		

- https://www.forbes.com/sites/palomacanterogomez/2019/04/10/how-to-frame-a-problem-to-find-the-right-solution/?sh=13af54355993

- https://hbswk.hbs.edu/item/how-entrepreneurs-can-find-the-right-problem-to-solve

- https://www.youtube.com/watch?v=6y3WIrgp_NY

- https://hbr.org/2014/07/what-you-need-to-know-about-segmentation

- https://www.youtube.com/watch?v=ReM1uqmVfP0

- https://www.youtube.com/watch?v=w62zW30PKms

- https://www.youtube.com/watch?v=FULiFueLGzE

- https://www.youtube.com/watch?v=7o8uYdUaFR4

- https://steveblank.com/2021/04/20/the-secret-to-the-minimum-viable-product/

- https://www.youtube.com/watch?v=1hHMwLxN6EM

- https://www.youtube.com/watch?v=4uGx14UVWPc

- https://www.youtube.com/watch?v=OVnN4S52F3k

- https://www.entrepreneur.com/article/251687

- https://www.forbes.com/sites/forbesbusinessdevelopmentcouncil/2020/09/14/13-key-steps-to-developing-a-go-to-market-strategy/?sh=53023c476fc1

- https://www.garyfox.co/business-model/business-model-channels/

- https://www.forbes.com/sites/allbusiness/2019/05/25/small-business-website-tips/?sh=2c551a0421ad

Savitribai Phule Pune University, Pune
Final Year Information Technology (2019 Course)
414456 : Project-II

Teaching Scheme:	Credit Scheme:	Examination Scheme:
Practical: 10 hrs/week	**05 Credits**	**Term Work : 100 Marks** **Oral : 50 Marks**

Prerequisite Courses, if any: Project Phase-I (B.E. (IT) Final Year Semester-I)

Companion Course, if any: NA

Course Objectives:

1. To enable the student to extend further the investigative study taken up under Project stage-I, either fully theoretical/practical or involving both theoretical and practical work, under the guidance of a Supervisor from the Department alone or jointly with a Supervisor drawn from R&D laboratory / Industry.
2. To build up exposure of implementation and hence develops analysis of results by considering performance measures.
3. To expose students to product development environment using industrial experience, use of state of art technologies.
4. To encourage and expose students with funding agency for sponsored projects.
5. To generate the opportunities to experience practically the facts learned in various fields together.
6. To improve overall communication skill, Teamwork and Leadership Qualities, professionalism.
7. Evaluate the various validation and verification methods.
8. Analyzing professional issues, including ethical, legal and security issues, related to computing projects.
9. To evaluate alternative approaches, and justify the results obtained.

Course Outcomes:

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

1. To apply engineering and mathematical knowledge to investigate / select proper technology / Algorithm suitable to solve the problem in hand.
2. To apply knowledge of statistics for analysis of results and express conclusion and justification for the same.
3. To design and conduct experiments, as well as to analyze and interpret data or develop prototype model of the application.
4. To communicate effectively.
5. Get broad education which is necessary to understand the impact of engineering solutions in a global, economic, environmental, ethically and societal context.
6. Recognition of the need for, and an ability to engage in life-long learning.

Introductory Information:

BE Project Phase-II is the continuation of Project Phase-I for implementation, and analysis of results to arrive a valid conclusion with justification.

Guidelines to Faculty and Students:

1. Preferably same review committee needs to continue for Project Phase-II.
2. There shall be **TWO** reviews in Project phase –II (in semester-II) by the review committee.
3. The Project Review committee will be responsible for evaluating the timely progress of the projects. It is suggested to evaluate the skills learned by the students in their PBL (in their previous years).
4. Student needs to justify the Algorithm / Model used for implementation.
5. Every student of the project group shall make presentation on the progress made by them before the committee during each reviews. Each student/group is required to give presentation as part of review for 10 to 15 minutes followed by a detailed discussion and query session.
6. Students need to note down the queries raised during review(s) and comply the same in the next review session.
7. The record of the remarks/suggestions of the review committee (project dairy) should be properly maintained in continuation of Project Phase-II and should be made available at the time of university examination.
8. Project group needs to present / publish **TWO** papers (One in each semester, at least one paper should be in **UGC – Care journal**).
   a. Paper must be checked for Plagiarism by any open software.
   b. One paper during second semester which includes Methodologies / Algorithms implemented, Results obtained, Analysis of results and conclusion.
9. Project report must also be checked for Plagiarism.
10. The examinee will be assessed by a panel of examiners of which one is necessarily an external examiner. The assessment will be broadly based on work undergone, content delivery, presentation skills, documentation, question-answers and report.

Review 3: Implementation –

Points to be covered:

1. Detailed study of Algorithm(s) / Model / Hardware specification (As applicable).
2. Confirmation of Data set used (As applicable)
3. Detailed ER Diagram / DFD diagrams.
4. Detailed UML Diagrams.
5. Sample results (module based).

Review 4: Testing and Result Analysis.

Points to be covered:

1. Appropriate test cases and results of test cases.
2. Representation of results with analysis.
3. Conclusion over performance parameters (as applicable)
4. Conclusion and future work suggested.
5. Knowledge of references utilized.

Evaluation Criteria:

Following criteria and weightage is suggested for evaluation of Project-Phase II Term Work.

1. Availability of standard Data set / Input parameters: 10%
2. Depth of Understanding of implemented Technology / Algorithm / Domain / Model: 40%
3. Test cases / Validation and Verification process: 10%
4. Justification of Algorithm / Model / Architecture / System: 10%
5. Analysis of results and conclusion: 10%
6. Presentation Skill: 10%
7. Report preparation and Paper publication: 10%

Project report contains the details as Follows:

It is suggested to have only one Project report which includes work carried at Project Phase-I as well. Project report must have:

 i. Certificate from the institute.
 ii. Certificate sponsoring organization (If any).
 iii. Acknowledgement.
 iv. Abstract.
 v. Contents.
 vi. List of Abbreviations (As applicable).
 vii. List of Figures (As applicable).
viii. List of Graphs (As applicable).
 ix. List of Tables (As applicable).
   1) Introduction and aims/motivation and objectives.
   2) Literature Survey (with proper citation).
   3) Problem Statement/definition.
   4) Software Requirement Specification (In SRS Documentation only).
   5) Flowchart
   6) Project Requirement specification.
   7) Proposed system Architecture.
   8) High level design of the project (DFD , UML , ER Diagrams).
   9) System implementation-code documentation: Algorithm style, Description of detailed methodologies, protocols used etc..as applicable.
   10) Test cases.
   11) GUI/Working modules and Experimental Results in suitable format.
   12) Project Plan.
   13) Analysis and Conclusions with future work.
   14) Bibliography in IEEE format.
 Appendices
   a) Plagiarism Report of Paper and Project report from any open source tool.
   b) Base Paper(s) [If any].
   c) Tools used / Hardware Components specifications [If any].
   d) Published Papers and Certificates (Both Papers).

Use appropriate plagiarism tools, reference managers, Latex for efficient and effective project writing.

Savitribai Phule Pune University, Pune		
B.E Information Technology (2019 Course)		
414457B: Audit Course 8		
Cyber Laws And Use Of Social Media		

Teaching Scheme:	Credit Scheme:	Examination Scheme:
Theory (TH): 01 hrs/week	**Non-Credit**	**Audit Course**

Prerequisite Courses: Programming using any high-level language.

Course Objectives:

To understand and aware Cyber laws which are focusing on protecting the privacy of users from organizations and other users.

To know the cyber threats happening around them and to help them stay secure in the daily use of Cyberspace.

Course Outcomes:

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

CO1. Understand the importance of IT Act.

CO2. Understand the significance of cyber laws and its practices.

CO3. Identify and Analyze software vulnerabilities and security solutions to reduce the risk of exploitation.

CO4. To study various privacy and security concerns of Online social media.

COURSE CONTENTS		
Unit I	**Introduction to IT Act**	**(03 hrs)**

Evolution of the IT Act, Genesis and Necessity Various authorities under IT Act and their powers: Penalties & Offences, amendments. Traditional Principals of Jurisdiction, Extra-terrestrial Jurisdiction, Case Laws on Cyber Space Jurisdiction

Mapping of Course Outcomes for Unit I	CO1

Unit II	**Cyber Law: International Perspective**	**(03 hrs)**

EDI: Concept and legal Issues, UNCITRAL Model Law, Electronic Signature Laws of Major Countries, Cryptography Laws, Cyber Laws of Major Countries, EU Convention on Cyber Crime

Mapping of Course Outcomes for Unit II	CO2

Unit III	**Cyber Forensic and Computer Crimes**	**(03 hrs)**

Types, Crimes targeting Computers: Definition of Cyber Crime & Computer related crimes.

Classification & Differentiation between traditional crime and cyber-crimes.

Cyber-crimes and cyber terrorism: -

a) Cyber-crimes and the categories of crime i) Cyber frauds ii) Cyber thefts iii) Cyber stacking

b) Cyber Terrorism. c) Hacking, Virus, Trojan, worms etc.

Mapping of Course Outcomes for Unit III	CO3

Unit IV	**Use of Social Media**	**(03 hrs)**

Elements of Social Networks, Social Media Outlets. (Facebook, Twitter, etc.): How the differences impact, how to use them. Videos: Broadcasting to peers, many to many, friends and followers, apps, pages, pseudonyms of good and evil Focused Networks (Flickr, Linked In, YouTube, etc.) networks that focus on specific topics or activities	
Mapping of Course Outcomes for Unit IV	**CO4**

Textbooks:

1. The Information Technology act, 2000, Bare Act-Professional Book Publishers, New Delhi.
2. Aparna Viswanathan, "Cyber Law- Indian and International Perspectives On Key Topics Including Data Security, E-Commerce, Cloud Computing and Cyber Crimes".
3. First Responder's Guide to Computer Forensics by Richard Nolan etal; Carnegi Mellon, 2005.
4. https://nptel.ac.in/courses/106106146

Evaluation

Students should select any one of the topics in a group of 3 to 5. Students should submit a written report and make a presentation on the topic. The task should not be repeated among students. Report will be evaluated by the faculty as per rubrics defined by him/her/them at start of course.

<table>
<tr><td colspan="4" align="center">**Savitribai Phule Pune University, Pune**
B.E Information Technology (2019 Course)
414457C: Audit Course 8
Constitution Of India</td></tr>
</table>

Teaching Scheme:	Credit Scheme:	Examination Scheme:
Theory(TH): 01 hrs/week	Non-Credit	Audit Course

Prerequisite Courses, if any:

Course Objectives:

1. Understand the premises informing the twin themes of liberty and freedom from a civil rights perspective.
2. To address the growth of Indian opinion regarding modern Indian intellectuals' constitutional role and entitlement to civil and economic rights.
3. To address the role and functions of local administration.

Course Outcomes:

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

CO1. Understand the Principles of the Indian Constitution.

CO2. Understand and identify the growth of the demand for civil rights in India.

CO3. Understand the organizations of governance.

CO4. Understand the role and functions of local administration.

COURSE CONTENTS		
Unit I	**History of Making of the Indian Constitution**	**(03 hrs)**
History Drafting Committee, (Composition & Working), Philosophy of the Indian Constitution: Preamble, Salient Features		
Mapping of Course Outcomes for Unit I	CO1	
Unit II	**Contours of Constitutional Rights & Duties**	**(03 hrs)**
Fundamental Rights, Right to Equality, Right to Freedom, right against Exploitation, Right to Freedom of Religion, Cultural and Educational Rights, Right to Constitutional Remedies, Directive Principles of State Policy, Fundamental Duties.		
Mapping of Course Outcomes for Unit II	CO2	
Unit III	**Organs of Governance:**	**(03 hrs)**
Parliament, Composition, Qualifications and Disqualifications, Powers and Functions, Executive, President, Governor, Council of Ministers, Judiciary		
Mapping of Course Outcomes for Unit III	CO3	
Unit IV	**Local Administration and Election Commission**	**(03 hrs)**

District's Administration head: Role and Importance, Municipalities: Introduction, Mayor and role of Elected representative, CEO of Municipal Corporation. Pachayati raj: Introduction, PRI: Zila Pachayat. Elected officials and their roles, CEO Zila Pachayat: Position and role. Block level: Organizational Hierarchy (Different departments), Village level: Role of Elected and Appointed officials, Importance of grass root democracy. Election Commission: Role and Functioning	
Mapping of Course Outcomes for Unit IV	**CO4**

Textbooks:
1. The Constitution of India, 1950 (Bare Act), Government Publication.
2. Dr. S. N. Busi, Dr. B. R. Ambedkar framing of Indian Constitution, 1st Edition, 2015.
3. M. P. Jain, Indian Constitution Law, 7th Edn., Lexis Nexis, 2014.
4. D.D. Basu, Introduction to the Constitution of India, Lexis Nexis, 2015.
5. https://nptel.ac.in/courses/129106003

Evaluation:
Students should select any one of the topics in a group of 3 to 5. Students should submit a written Report. Make a presentation on the topic. Report will be evaluated by the faculty as per rubrics defined by them at start of course.