1.3.1 List of BE Information technology Engineering Courses which addresses crosscutting issues in Curriculum (Syllabus/Pattern 2015, 2019) related to professional ethics, gender, human values, environment and sustainability

Sr. No.	Program	Syllabus Pattern	Class	Course/Subject Name & code	Issues addressed
1	Information Technology	2019 Pattern	SE	Audit Course 3: 214450A- Ethics and values in IT	Inclusion of Humanvalues, professional ethics in the curriculum
2	Information Technology	2019 Pattern	SE	Audit Course 3: 214450C Language Study- Japanese- Module	Inclusion of human values and sustainability the curriculum
3	Information Technology	2019 Pattern	SE	Audit Course 3: 214450D- Cyber Security and Law	Inclusion of professional ethics in the curriculum
4	Information Technology	2019 Pattern	SE	Audit Course 4: 214459A - Water Supply and Treatment	Inclusion of environment and sustainability in the curriculum
5	Information Technology	2019 Pattern	SE	Audit Course 4: 214459C - Waste Management and Pollution Control	Inclusion of environment and sustainability in the curriculum
6	Information Technology	2019 Pattern	SE	Audit Course: 214459D - Intellectual Property Rights	Inclusion of Humanvalues, professional ethics in the curriculum
7	Information Technology	2019 Pattern	SE	Soft Skills (214449)	Professional ethics, Human values in the curriculum
8	Information Technology	2019 Pattern	SE	Programming Skill Development Lab(214455)	Inclusion of Humanvalues, professional ethics in the curriculum
9	Information Technology	2019 Pattern	SE	Project Based Learning (214458)	Inclusion of Professional ethics in the curriculum
10	Information Technology	2019 Pattern	TE	Human Computer Interaction(314444)	Inclusion of environment and sustainability in the curriculum
11	Information Technology	2019 Pattern	TE	Audit Course 5: 314450A-Banking and	Inclusion of Humanvalues, professional ethics in the

				Insurance	curriculum
12	Information Technology	2019 Pattern	TE	Audit Course 5: 314450B-Startup Ecosystems	Inclusion of Humanvalues, professional ethics in the curriculum
13	Information Technology	2019 Pattern	TE	Elective-II: 314445C-Design Thinking	Inclusion of Humanvalues, professional ethics in the curriculum
14	Information Technology	2019 Pattern	TE	Audit Course 6: 314459A - Green and Unconventional Energy	Inclusion of environment and sustainability in thecurriculum
15	Information Technology	2019 Pattern	TE	Seminar (314449)	Inclusion of Professional ethics in the curriculum
16	Information Technology	2019 Pattern	TE	314459B - Leadership and Personality Development	Inclusion of Humanvalues, professional ethics in the curriculum
17	Information Technology	2019 Pattern	TE	314454B- Cyber Security	Inclusion of Humanvalues, professional ethics in the curriculum
18	Information Technology	2019 Pattern	TE	Internship(314455)	Inclusion of Professionalethics in the curriculum
19	Information Technology	2019 Pattern	BE	Audit Courses 7: 414449A: Copyrights and Patents	Inclusion of Humanvalues, professional ethics in the curriculum
20	Information Technology	2019 Pattern	BE	Audit Courses 7: 414449B: Stress Management by Yoga	Inclusion of Humanvalues, gender, sustainability in the curriculum
21	Information Technology	2019 Pattern	BE	Audit Courses 7: 414449C: English for Research Paper Writing	Inclusion of Humanvalues, professional ethics in the curriculum
22	Information Technology	2019 Pattern	BE	Project Phase-I (414448)	Inclusion of Professionalethics in the curriculum
23	Information Technology	2019 Pattern	BE	Audit Courses 8: 414457B: Cyber Laws and Use of Social Media	Inclusion of Humanvalues, professional ethics in the curriculum

24	Information Technology	2019 Pattern	BE	Audit Courses 8: 414457C: Constitution of India	Inclusion of Humanvalues, gender, sustainability in the curriculum
25	Information Technology	2019 Pattern	BE	Elective VI: 414452A Ethical Hacking and Security	Inclusion of professional ethics in the curriculum
26	Information Technology	2019 Pattern	BE	Project Phase-II (414456)	Inclusion of Professionalethics in the curriculum

Faculty of Science & Technology
Savitribai Phule Pune University, Pune
Maharashtra, India

Curriculum

for

Second Year of Information Technology

(2019 Course)

(With effect from AY 2020-21)

Home

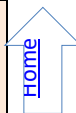| Course Code	Course Name	Teaching Scheme (Hours/Week)			Examination Scheme and Marks						Credit			
		Theory	Practical	Tutorial	IN-Sem	End-Sem	TW	PR	OR	Total	TH	PR	TUT	Total
214441	Discrete Mathematics	03	-	01	30	70	25	-	-	125	03	--	01	04
214442	Logic Design and Computer Organization	03	-	-	30	70	-	-	-	100	03	-	-	03
214443	Data Structures and Algorithms	03	-	-	30	70	-	-	-	100	03	-	-	03
214444	Object Oriented Programming	03	-	-	30	70	-	-	-	100	03	-	-	03
214445	Basics of Computer Network	03	-	-	30	70	-	-	-	100	03	-	-	03
214446	Logic Design Computer Organization Lab	-	02	-	-	-	25	25	-	50	-	01	-	01
214447	Data Structures and Algorithms Lab	-	04	-	-	-	25	25	-	50	-	02	-	02
214448	Object Oriented Programming Lab	-	04	-	-	-	25	25	-	50	-	02	-	02
214449	Soft Skill Lab	-	02	-	-	-	25	-	-	25	-	01	-	01
214450	Mandatory Audit Course 3	-	-	-	-	-	-	-	-	-	Non Credit			-
	Total	15	12	01	150	350	125	75	--	700	15	06	01	22

Savitribai Phule Pune University
Second Year of Information Technology Engineering(2019 Course)
(With effect from Academic Year 2020-21)
Semester-III

Abbreviations:
TH: Theory   TW: Term Work   PR: Practical
OR: Oral   TUT: Tutorial

Note: Students of S.E. (Information Technology) can opt any one of the audit course from the list of audit courses prescribed by BoS (Information Technology)

#Mandatory Audit Course 3:   214450A- Ethics and values in IT
                                  214450B - Quantitative Aptitude and Logical Reasoning
                                  214450C- Language Study- Japanese- Module
                                  214450D-Cyber Security and Law

	Savitribai Phule Pune University, Pune Second Year of Information Technology Engineering (2019 Course) (With effect from Academic Year 2020-21)													
	Semester-IV													
Course Code	Course Name	Teaching Scheme (Hours/Week)			Examination Scheme and Marks						Credit			
		Theory	Practical	Tutorial	IN-Sem	End-Sem	TW	PR	OR	Total	TH	PR	TUT	Total
207003	Engineering Mathematics- III	03	-	01	30	70	25	-	-	125	03	--	01	04
214451	Processor Architecture	03	-	-	30	70	-	-	-	100	03	-	-	03
214452	Database Management System	03	-	-	30	70	-	-	-	100	03	-	-	03
214453	Computer Graphics	03	-	-	30	70	-	-	-	100	03	-	-	03
214454	Software Engineering	03	-	-	30	70	-	-	-	100	03	-	-	03
214455	Programming Skill Development Lab	-	02	-	-	-	25	25	-	50	-	01	-	01
214456	Database Management System Lab	-	04	-	-	-	25	25	-	50	-	02	-	02
214457	Computer Graphics Lab	-	02	-	-	-	-	25	-	25	-	01	-	01
214458	Project Based Learning	-	04	-	-	-	50	-	-	50	-	02	-	02
214459	Mandatory Audit Course 4	-	-	-	-	-	-	-	-	-	Non Credit			-
	Total	15	12	01	150	350	125	75	-	700	15	06	01	22

Abbreviations:

TH: Theory TW: Term Work PR: Practical

OR: Oral TUT: Tutorial

Note: Students of S.E. (Information Technology) can opt any one of the audit course from the list of audit courses prescribed by BoS (Information Technology)

#Mandatory Audit Course 4: **214459A** - Water Supply and Treatment

214459B - Language Study- Japanese- Module II

214459C - Waste Management and Pollution Control

214459D - Intellectual Property Rights

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 (C) : Mandatory Audit Course 3:		
Language Study Japanese -Module I		
Teaching Scheme:	**Credit Scheme:**	**Examination Scheme:**
01hrs/week	**Non Credit**	**Audit Course**

Prerequisite Courses, if any: Audit Course 4: Language Study Japanese: Module-II

Course Objectives:
1. To teach pronunciation and intonation of Japanese sounds.
2. To enable students to comprehend and speak simple sentences in Japanese.
3. To introduce Japanese language at the basic level, to enable students to read and write the phonetic scripts, *Hiragana* and *Katakana,* and approx.100 *Kanji.,*
4. To teach some aspects of Japanese society and culture.

Course Outcomes:
On completion of the course, learner will be able to --
    CO1: Converse with simple sentences in Japanese.
    CO2: Recognize and read simple sentences in Japanese.
    CO3: Write simple sentences in Japanese.
    CO4: Be aware about Japanese society and people.

COURSE CONTENTS		
Unit I	**Japanese Oral Expression**	**(02 hrs + 04 hrs Self Study)**

Oral practice of pronunciation and intonation of Japanese sounds, Japanese greetings, self-introduction, identifying things, time of the day, calendar; counting using Japanese numerical classifiers; describing things; making comparisons; talking of daily activities, kinship terms used for address and reference, seasons, giving and receiving, shopping; making requests, talking of one's likes and dislikes

Mapping of Course Outcomes for Unit I	**CO1**	
Unit II	**Japanese Kana and Kanji**	**(02 hrs + 04 hrs Self Study)**

Introduction of the Japanese writing system, i.e. *Hiragana*, *Katakana* and *Kanji* (100-120), word-building, writing foreign names and loan words in Katakana

Mapping of Course Outcomes for Unit II	**CO2, CO3**	
Unit III	**Japanese Greetings**	**(02 hrs + 04 hrs Self Study)**

Basic sentence patterns to be applied in self-introduction, identifying things; time of the day; calendar; counting using Japanese numerical classifiers; describing things; making comparisons; talking of daily activities; kinship terms used for address and reference; seasons; giving and receiving; shopping; making requests; talking of one's likes and dislikes

Mapping of Course Outcomes for Unit III	CO1	
Unit IV	**Japanese Comprehension**	**(02 hrs+ 04 hrs Self Study)**

Extensive practice of basic patterns at the elementary level through drills and exercises

Mapping of Course Outcomes for Unit IV	CO1, CO2	
Unit V	**Speaking Japanese**	**(02 hrs + 4 hrs Self Study)**

Simple conversation in situations such as describing things, making comparisons, talking of daily activities, giving and receiving of gifts, talking of illnesses and visit to a doctor, shopping, making requests, talking of one's likes and dislikes, talking on telephone etc.

Mapping of Course Outcomes for Unit V	CO1	
Unit VI	**Social Environment of Japan**	**(02 hrs + 4 hrs Self Study)**

An introduction to some aspects of Japanese culture such as festivals, Japanese seasons, Japanese people and their love for nature; Japanese food, sports; society; geography; education system; Japan and the world etc. The objective is to create general awareness in students about life in Japan.

Mapping of Course Outcomes for Unit VI	CO4

E-Resources for Learning Support:

a. **https://www.duolingo.com/course/ja/en/Learn-Japanese**
b. **https://www.freejapaneselessons.com/**
c. **https://minato-jf.jp/** (Japan Foundation)

Text Books:

1. Taeko Kamiya, Japanese For Fun Phrasebook & Dictionary: The Easy Way to Learn Japanese Quickly, Rev Edition 2017 Tuttle Publishing, (ISBN 10- 4805313986, ISBN 13 -9784805313985)
2. Eri Banno, Genki I: An Integrated Course in Elementary Japanese , 3rd Edition 2020, The Japan Times, (ISBN13: 9784789017305)
3. Sushama Jain, Japan : The Living Culture, Har-anand Publications, 2009, (ISBN 10: 8124114870 / ISBN 13: 9788124114872)

Reference Books:

1. Kanji Power Handbook for the Japanese Language Proficiency Test, 1994, ARC Press (ISBN: 9784872343144)
2. Yukiko Ogata, Kana Sumitani, Yasuko Hidari, Yukiko Watanabe, Nihongo fun and Easy -I Survival Japanese Conversation for Beginners,
3. Eriko Sato, Japanese Demystified: A Self-Teaching Guide, 2008, McGraw-Hill Companies, McGraw-Hill Demystified Series (ISBN 10-0071477268, ISBN 13-9780071477260)

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 (D) : Mandatory Audit Course 3:** **Cyber Security and Law**		
Teaching Scheme:	**Credit Scheme:**	**Examination Scheme:**
01hrs/week	**Non Credit**	**Audit Course**

Prerequisite Courses, if any: Basics of Computer

Course Objectives:
1. Understand basics of computer and cyber security.
2. To study the information technology law.
3. To understand reasons for cybercrime.
4. To learn investigation techniques.

Course Outcomes:

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

CO1: Understand the basic concepts of cyber security and its abilities

CO2: Analyse and evaluate the cyber security needs of an organization.

CO3: Understand the importance of cyber laws and its practices.

CO4: Determine and analyse software vulnerabilities and security solutions to reduce the risk of exploitation

COURSE CONTENTS		
Unit I	**Basics of Cyber Security**	**04 hrs**

Information Security Definition and Concepts, Overview of Security Threats , Goals of Security, , Limitations and Challenges in cyber security , Types of Security attacks, Network Security, Malicious Codes, Intrusion detection systems, Hacking Techniques, Password cracking , Insecure Network Connections ,Concept of Firewall and Security.

Mapping of Course Outcomes for Unit I	**CO1, CO2**

Unit II	**Cyber Laws**	**04 hrs**

Introduction, Definition and origin, Cybercrime and Information security, Classification of Cybercrimes, The legal perspectives- Indian perspective- IT Act 2000, Global perspective, Categories of Cybercrime, Reasonable Security Practices

Mapping of Course Outcomes for Unit II	**CO2, CO3, CO4**

Unit III	**Cyber Crime**	**04 hrs**

Definition of Cyber Crime & Computer related Crimes, Classification &Differentiation between traditional crime and cybercrimes, Data Theft, Hacking, Spreading Virus &Worms, Phishing, Cyber Stalking/ Bullying, Identity Theft &Impersonation, Credit card & Online Banking Frauds , Denial of Service Attacks , Cyber terrorism etc.. , Search and Seizure Procedures of Digital Evidence- Data

Acquisition ,Data Analysis, Reporting, Cybercrime Scenario in India	
Mapping of Course Outcomes for Unit III	**CO2, CO3, CO4**

Text Books:

1. William Stallings, "Computer Security: Principles and Practices", Pearson 6th Ed, ISBN: 978-0-13-335469-0
2. Nina Godbole, Sunit Belapure, "Cyber Security- Understanding Cyber Crimes, Computer Forensics and Legal Perspectives", Wiley India Pvt.Ltd, ISBN- 978-81-265-2179-1
3. Nina Godbole , "Information Systems Security" , Wiley India Pvt. Ltd, ISBN -978-81-265-1692-6
4. Mark Merkow, "Information Security-Principles and Practices", Pearson Ed., ISBN- 978-81-317-1288-7
5. Bernard Menezes, "Network Security and Cryptography", Cengage Learning, ISBN-978-81-315-1349-1
6. "The Information Technology Act, 2000; Bare Act" – Professional Book Publishers

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.

SEMESTER – IV

Savitribai Phule Pune University, Pune

Savitribai Phule Pune University, Pune

Second Year Information Technology (2019 Course)

214455: Programming Skill Development Lab

Teaching Scheme:	Credit Scheme:	Examination Scheme:
Theory(TH) :02hrs/week	01	PR: 25Marks TW: 25Marks

Prerequisites: Computer Organization and Architecture

Course Objectives:
1. To learn embedded C programming and PIC18FXXXmicrocontrollers.
2. To learn interfacing of real-world input and output devices to PIC18FXXX microcontroller

Course Outcomes:

On completion of this course student will be able to --

CO1: Apply concepts related to embedded C programming.

CO2: Develop and Execute embedded C program to perform array addition, block transfer, sorting operations

CO3: Perform interfacing of real-world input and output devices to PIC18FXXX microcontroller.

CO4: Use source prototype platform like Raspberry-Pi/Beagle board/Arduino.

Guidelines for Instructor's Manual

The faculty member should prepare the laboratory manual for all the experiments and it should be made available to students and laboratory instructor/Assistant. The instructor's manual should include prologue, university syllabus, conduction & Assessment guidelines, topics under consideration- concept, objectives, outcomes, algorithm, sample test cases etc.

Guidelines for Student's Lab Journal

1. The laboratory assignments should be submitted by students in the form of journal. The Journal consists of Certificate, table of contents, and write-up of each assignment (Title, Objectives, Problem Statement, Outcomes, software & Hardware requirements, Date of Completion, Assessment grade/marks and assessor's sign, Theory- Concept, circuit diagram, pin configuration, conclusion/analysis).
2. As a conscious effort and little contribution towards Green IT and environment awareness, attaching printed papers as part of program listing to journal may be avoided.
3. Use of Digital media like shared drive containing students' programs maintained by lab In-charge is highly encouraged.
4. Practical Examination will be based on the term work submitted by the student in the form of journal.
5. Candidate is expected to know the theory involved in the experiment.
6. The practical examination should be conducted if the journal of the candidate is completed in all respects and certified by concerned faculty and head of the department.
7. All the assignment mentioned in the syllabus must be conducted.

Guidelines for Lab /TW Assessment

1. Examiners will assess the term work based on performance of students considering the parameters such as timely conduction of practical assignment, methodology adopted for

implementation of practical assignment, timely submission of assignment in the form of write-up along with results of implemented assignment, attendance etc.

2. Examiners will judge the understanding of the practical performed in the examination by asking some questions related to theory & implementation of experiments he/she has carried out.

3. Necessary knowledge of usage of software and hardware of PIC18FXXX microcontrollers and its interfacing kits should be checked by the concerned faculty members.

Guidelines for Laboratory Conduction

The instructor is expected to frame the assignments by understanding the prerequisites, technological aspects, utility and recent trends related to the topic. The instructor may set multiple sets of assignments and distribute among batches of students. It is appreciated if the assignments are based on real world problems/applications.

Guidelines for Practical Examination

Both internal and external examiners should jointly set problem statements for practical examination. During practical assessment, the expert evaluator should give the maximum weightage to the satisfactory implementation of the problem statement. The supplementary and relevant questions may be asked at the time of evaluation to judge the student's understanding of the fundamentals, effective and efficient implementation. The evaluation should be done by both external and internal examiners.

Suggested List of Laboratory Assignments

Suggested List of Laboratory Assignments Group A (Any Three):

Mapping of Course Outcomes for Group A -- CO1 , CO2

1. Study of Embedded C programming language (Overview, syntax, One simple program like addition of two numbers).
2. Write an Embedded C program to add array of n numbers.
3. Write an Embedded C program to transfer elements from one location to another for following:
i) Internal to internal memory transfer
ii) Internal to external memory transfer
4. Write an Embedded C menu driven program for :
i) Multiply 8 bit number by 8 bit number
ii) Divide 8 bit number by 8 bit number
5. Write an Embedded C program for sorting the numbers in ascending and descending order.

Group B (Any Three):

Mapping of Course Outcomes for Group B -- CO3

6. Write an Embedded C program to interface PIC 18FXXX with LED & blinking it using specified delay.
7. Write an Embedded C program for Timer programming ISR based buzzer on/off.
8. Write an Embedded C program for External interrupt input switch press, output at relay.
9. Write an Embedded C program for LCD interfacing with PIC 18FXXX.

Group C (Any two):

Mapping of Course Outcomes for Group C -- CO3

10. Write an Embedded C program for Generating PWM signal for servo motor/DC motor.

11. Write an Embedded C program for PC to PC serial communication using UART.

12. Write an Embedded C program for Temperature sensor interfacing using ADC & display on LCD.

Group D:
Mapping of Course Outcomes for Group D -- CO4

13. Study of Arduino board and understand the OS installation process on Raspberry-pi.

14. Write simple program using Open source prototype platform like Raspberry-Pi/Beagle board/Arduino for digital read/write using LED and switch Analog read/write using sensor and actuators.

Reference Books :

1. Mazidi, Rolin McKinlay and Danny Causey, 'PIC Microcontroller and Embedded Systems using Assembly and C for PIC18", Pearson Education
2. "Raspberry Pi for Beginners", 2nd Edition book" e-book.
3. Peatman, John B, "Design with PIC Microcontroller", Pearson Education PTE,
4. Ramesh Gaonkar, "Fundamentals of Microcontrollers and Applications In Embedded Systems (with the PIC18 Microcontroller Family)"Thomson/Delmar Learning; 1 edition (January 8, 2007), ISBN:978-1401879143.

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

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

</td></tr>
<tr><td>**Teaching Scheme:**</td><td>**Credit Scheme:**</td><td>**Examination Scheme:**</td></tr>
<tr><td>**01hrs/week**</td><td>**Non Credit**</td><td>**Audit Course**</td></tr>
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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.

<table>
<tr><td colspan="3" align="center">**COURSE CONTENTS**</td></tr>
<tr><td align="center">**Unit I**</td><td align="center">**Introduction To Environment, Water Requirement And Water Sources**</td><td align="center">**02 hrs**</td></tr>
<tr><td colspan="3">

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

</td></tr>
<tr><td>**Mapping of Course Outcomes for Unit I**</td><td colspan="2">CO1</td></tr>
<tr><td align="center">**Unit II**</td><td align="center">**Quality And Treatment Of Water**</td><td align="center">**02 hrs**</td></tr>
<tr><td colspan="3">

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.

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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 (B): Mandatory Audit course 4 :
Language Study Japanese : Module - II

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

Prerequisite Courses: Audit Course 3**:** Language Study Japanese: Module-I

Course Objectives :

1. To develop the Japanese communicative competence of students with small sentence formation.to make primitive social conversation in Japanese.
2. To enable students with comprehension ability of Japanese grammar.
3. To enable students to translate simple conversations from English to Japanese and vice a versa.
4. To make students aware about Japanese Culture and Customs.

Course Outcomes :

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

    CO1: Have Japanese Communicative competence for primitive Social conversation in Japanese

    CO2: Comprehend Grammar of Japanese Script

    CO3: Translate simple sentences from Japanese to English and vice a versa

    CO4: Be aware about Japanese society and people

COURSE CONTENTS		
Unit I	**Japanese Conversation**	**(02 hrs +04hrs Self Study)**

Oral practice of conversation in situations such as declining an invitation, reporting an event, narrating a story, short formal speeches on occasions such as welcoming, introducing and thanking a guest, talking about Japanese and Indian festivals, hostel life etc

Mapping of Course Outcomes for Unit I	**CO1**	
Unit II	**Japanese Text and Kanji**	**(02hrs +04 hrs Self Study)**

Diverse texts based on Japanese culture, customs, history, food habits, and science etc, for the development of communicative competence of students; skimming, scanning of texts with emphasis on advanced sentence patterns, grammatical structures and idiomatic phrases, reading and writing of approximately 400 *kanji*.

Mapping of Course Outcomes for Unit II	**CO2,CO3**	
Unit III	**Japanese Grammar and Composition**	**(02 hrs +04 hrs Self Study)**

Basic sentence patterns to be applied in self introduction, identifying things; time of the day; calendar; counting using Japanese numerical classifiers; describing things; making comparisons; talking of daily activities; kinship terms used for address and reference; seasons; giving and receiving; shopping; making requests; talking of one's likes and dislikes

Mapping of Course Outcomes for Unit III	CO2, CO3	
Unit IV	**Japanese – English Translation**	**(02hrs +04 hrs Self Study)**

Practice in English to Japanese and Japanese to English translation of short passages on various topics such as culture, society, religion and life style taken from books, newspapers, magazines, internet etc.

Mapping of Course Outcomes for Unit IV	CO3	
Unit V	**Language and Literature of Japan**	**(02 hrs.)**

History of Japanese language, literary trends, religions, spread of Chinese influence, development of art and culture in Japan.

Mapping of Course Outcomes for Unit V	CO4

E-Resources for Learning Support:

1. **https://www.duolingo.com/course/ja/en/Learn-Japanese**
2. **https://www.freejapaneselessons.com/**
3. **https://minato-jf.jp/**(Japan Foundation)

Text Books:

1. EriBanno, Genki I: An Integrated Course in Elementary Japanese , 3rd Edition 2020, The Japan Times, (ISBN13: 9784789017305)
2. George Trombley , Yukari Takenaka, Japanese From Zero, 6th Edition, Learn From Zero Publishers (ISBN10- 0976998122, ISBN13-9780976998129)
3. Tae Kim, A Guide to Japanese Grammar, 2012, CreateSpace Publishing, (ISBN-1469968142, ISBN13- 9781469968148) http://www.guidetojapanese.org/learn/grammar

Reference Books:

1. Yukiko Ogata, Kana Sumitani, Yasuko Hidari, Yukiko Watanabe, Nihongo fun and Easy -II, Basic Grammar for Conversation
2. Nobuo Akiyama, Carol Akiyama, Japanese Grammar (Barron's Grammar), 3rd edition 2012, Barrons Educational Series
3. Storry Richard, A History Of Modern Japan, 1973, Penguin Books Ltd,
4. James W. Heisig, Remembering the Kanji 1 : A Complete Course on How Not To Forget the Meaning and Writing of Japanese Characters, 6h Edition, University of Hawai'i Press (ISBN10-0824835921, ISBN13-9780824835927)

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.

Faculty of Science & Technology

Savitribai Phule Pune University,

Pune,Maharashtra, India

Curriculum For

Third Year of Information Technology

(2019 Course)

(With effect from AY 2021-22)

	Savitribai Phule Pune University													
	Third Year of Information Technology (2019 course)													
	(With effect from Academic Year 2021-22)													
	Semester-V													
Course Code	**Course Name**	**Teaching Scheme (Hours/ week)**			**Examination Scheme and Marks**						**Credit Scheme**			
		Theory	Practical	Tutorial	Mid-Sem	End-Sem	Term work	Practical	Oral	Total	Lecture	Practical	Tutorial	Total
314441	**Theory of Computation**	03	-	-	30	70	-	-	-	100	3	-	-	3
314442	**Operating Systems**	03	-	-	30	70	-	-	-	100	3	-	-	3
314443	**Machine Learning**	03	-	-	30	70	-	-	-	100	3	-	-	3
314444	**Human Computer Interaction**	03	-	-	30	70	-	-	-	100	3	-	-	3
314445	**Elective-I**	03	-	-	30	70	-	-	-	100	3	-	-	3
314446	**Operating Systems Lab**	-	04	-	-	-	25	25	-	50	-	2	-	2
314447	**Human Computer Interaction- Lab**	-	02	-	-	-		-	50	50	-	1		1
314448	**Laboratory Practice-I**	-	04	-	-	-	25	25		50	-	2	-	2
314449	Seminar	-	01	-	-	-	50	-	-	50	-	1	-	1
314450	**Audit Course 5**	-	-	-	-	-	-	-	-	-	-	-	-	-
								Total Credit			15	06	-	21
	Total	15	11	-	150	350	100	50	50	700	15	06	-	21

Abbreviations: TH: Theory, TW: Term Work, PR: Practical , OR: Oral ,TUT: Tutorial

Elective-I:	Audit Course 5:
314445A- **Design and Analysis of Algorithm**	314450A-**Banking and Insurance**
314445B- **Advanced Database and Management System**	314450B-**Startup Ecosystems**
314445C- **Design Thinking**	314450C- **Foreign Language–(Japanese Language- III)**
314445D- **Internet of Things**	

Laboratory Practice-I:
Assignment from Machine Learning and Elective I

Note: Students of T.E. (Information Technology) can opt any one of the audit course from the list of audit courses prescribed by BoS (Information Technology)

		Savitribai Phule Pune University Third Year of Information Technology (2019 Course) (With effect from Academic Year 2021-22)												
		Semester-VI												
Course Code	Course Name	Teaching Scheme (Hours/week)			Examination Scheme and Marks						Credit Scheme			
		Lecture	Practical	Tutorial	Mid-Sem	End-Sem	Term Work	Practical	Oral	Total	Lecture	Practical	Tutorial	Total
314451	Computer Networks& Security	03	-	-	30	70	-	-	-	100	03			03
314452	Data Science and Big Data Analytics	03	-	-	30	70	-	-	-	100	03			03
314453	Web Application Development	03	-	-	30	70	-	-	-	100	03			03
314454	Elective-II	03	-	-	30	70	-	-	-	100	03			03
314455	Internship	-	04	-	-	-	100	-	-	100		04		04
314456	Computer Networks& Security-Lab	-	04	-	-	-	25	-	50	75		02		02
314457	DS & BDA-Lab	-	02	-	-	-	25	25	-	50		01		01
314458	Laboratory Practice-II	-	04	-	-	-	50	25	-	75		02		02
314459	Audit Course 6	-	-	-	-	-	-	-	-	-	-	-	-	-
									Total		12	09	-	21
	Total	12	14	-	120	280	200	50	50	700	12	09	-	21

Abbreviations: TH: Theory, TW: Term Work, PR: Practical , OR: Oral, TUT: Tutorial

Elective-II:	Audit Course 6:
314454A- Artificial Intelligence	314459A - Green and Unconventional Energy
314454B- Cyber Security	314459B - Leadership and Personality Development
314454C -Cloud Computing	314459C- Foreign Language-(Japanese Language- IV)
314454D- Software Modeling and Design	

Laboratory Practice-II:
Assignments from Web Application Development and Elective-II.

Note: Students of T.E. (Information Technology) can opt any one of the audit course from the list of audit courses prescribed by BoS (Information Technology)

Savitribai Phule Pune University, Pune		
Third Year Information Technology (2019 Course)		
314444: Human Computer Interaction		
Teaching Scheme:	**Credit Scheme:**	**Examination Scheme:**
Theory (TH) : 3 hrs/week	**03 Credits**	**Mid_Semester : 30 Marks** **End_Semester : 70 Marks**

Prerequisite Courses:

1. Problem Solving and Object Oriented Technologies

Course Objectives:

1. To introduce to the field of human-computer-interaction study.
2. To gain an understanding of the human part of human-computer-interactions.
3. To learn to do design and evaluate effective human-computer-interactions.
4. To study HCI models and theories.
5. To understand HCI design processes.
6. To apply HCI to real life use cases.

Course Outcomes:

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

CO1: Explain importance of HCI study and principles of user-centered design (UCD) approach.

CO2: Develop understanding of human factors in HCI design.

CO3: Develop understanding of models, paradigms, and context of interactions.

CO4: Design effective user-interfaces following a structured and organized UCD process.

CO5: Evaluate usability of a user-interface design.

CO6: Apply cognitive models for predicting human-computer-interactions.

COURSE CONTENTS		
Unit I	**INTRODUCTION**	**(06 hrs)**

What is HCI?, Disciplines involved in HCI, Why HCI study is important? The psychology of everyday things Donald A. Norman, Principles of HCI, User-centered Design. Measurable Human factors.

Mapping of Course Outcomes for Unit I	CO1	
Unit II	**UNDERSTANDING THE HUMAN and HUMAN INTERACTION**	**(06 hrs)**

Input-output channels, Human memory, Human emotions, Individual differences, Psychology. Ergonomics, Human errors, Models of interaction, Paradigms of Interactions, Interaction styles, Interactivity, Context of interaction, User experience.

Mapping of Course Outcomes for Unit II	CO2	
Unit III	**HCI MODELS AND THEORIES**	**(06 hrs)**

User Profiles, categorization of users, Goal and task hierarchy model, Linguistic model, Physical and device models, GOMS, Norman's 7 stage model, Cognitive architectures, Hierarchical task analysis (HTA), Uses of task analysis, Diagrammatic dialog design notations.

Mapping of Course Outcomes for Unit III	CO3	
Unit IV	**DESIGN PROCESS**	**(06 hrs)**

Design Rules : Principles that support usability, Design standards, Design Guidelines, What is interaction design?, The software design process, User focus, Scenarios, Navigation Design, Screen Design, Prototyping techniques, Wire-Framing, Understanding the UI Layer and Its Execution Framework, Model-View-Controller(MVC) Framework

Mapping of Course Outcomes for Unit IV	CO4	
Unit V	**HCI GUIDELINES AND EVALUATION TECHNIQUES**	**(06 hrs)**

Using toolkits, User interface management system (UIMS), Goals of evaluation, Categorization of Evaluation techniques, Choosing an Evaluation Method. DECIDE, Heuristic Evaluation, cognitive walk through, Usability testing

Mapping of Course Outcomes for Unit V	CO5	
Unit VI	**FUTURE TRENDS**	**(06 hrs)**

Ubiquitous Computing, Design thinking, Finding things on web, Augmented Reality, Virtual Reality, Challenges in designing interfaces for smart homes, smart devices, handheld devices, smart wrist watch, Future of HCI

Mapping of Course Outcomes for Unit VI	CO6	
Text Books:		

1. Alan Dix (2008). Human Computer Interaction. Pearson Education. ISBN 978-81-317-1703-5.
2. Ben Shneiderman; Catherine Plaisant; Maxine Cohen; Steven Jacobs (29 August 2013).
3. Designing The User Interface: Strategies for Effective Human-Computer Interaction. Pearson Education Limited. ISBN 978-1-292-03701-1.

Reference Books:

1. Gerard Jounghyun Kim (20 March 2015). Human–Computer Interaction: Fundamentals and Practice.CRC Press. ISBN 978-1-4822-3390-2.
2. Donald A. Norman (2013). The Design of Everyday Things Basic Books. ISBN 978-0-465-07299-6.
3. Jeff Johnson (17 December 2013). Designing with the Mind in Mind: Simple Guide to Understanding User Interface Design Guidelines. Elsevier. ISBN 978-0-12-411556-9.
4. Alan Cooper; Robert Reimann; David Cronin; Christopher Noessel (13 August 2014). About Face: The Essentials of Interaction Design. Wiley. ISBN 978-1-118-76658-3.
5. Alan Cooper (1 January 1999). The Inmates are running the Asylum, Sam's. ISBN 978-0-672-31649-4.
6. John M. Carroll (21 May 2003). HCI Models, Theories, and Frameworks: Toward a MultidisciplinaryScience. Morgan Kaufmann. ISBN 978-0-08-049141-7.
7. Alan Cooper, Robert Reimann, David Cronin, Christopher Noessel, About Face: The Essentials of Interface Design, Wiley India, ISBN: 9788126559718,4th Ed
8. Rogers, Sharp, Preece, Interaction Design: Beyond Human Computer Interaction, Wiley India, ISBN:11. 9788126544912,3ed
9. Wilbert O. Galitz, The Essential Guide to user Interface Design, Wiley India, ISBN: 9788126502806

E- Books / E- Learning References:

1. http://hcibib.org/
2. Andriod Design Guidelines --- https://developer.android.com/guide/practices/ui_guidelines/index.html
3. iOS Human Interface Guidelines -- https://developer.apple.com/ios/human-interfaceguidelines/overview/design-principles/
4. MacOS Human Interface Guidelines ---- https://developer.apple.com/library/content/documentation/UserExperience/Conceptual/OSX HIGuidelines/
5. www.baddesigns.com

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.
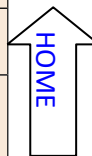
Timeline is suggested to follow throughout the semester:

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.
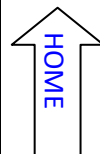
Guidelines for Seminar report

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.

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

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**

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
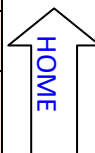 List of reference (Library books, magazines and other sources)

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	
	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

Faculty of Science & Technology
Savitribai Phule Pune University
Pune, Maharashtra, India

Curriculum for
Final Year of Information Technology
(2019 Course)
(With effect from AY 2022-23)

	Savitribai Phule Pune University Final Year of Information Technology (2019 Course) (With effect from Academic Year 2022-23)													
	Semester VII													
Course Code	Course Name	Teaching Scheme(Hours/week)			Examination Scheme and Marks						Credit Scheme			
		Lecture	Practical	Tutorial	Mid-Sem	End-Sem	Termwork	Practical	Oral	Total	Lecture	Practical	Tutorial	Total
414441	Information and Storage Retrieval	03	-	-	30	70	-	-	-	100	3	-	-	3
414442	Software Project Management	03	-	-	30	70	-	-	-	100	3	-	-	3
414443	Deep Learning	03	-	-	30	70	-	-	-	100	3	-	-	3
414444	Elective III	03	-	-	30	70	-	-	-	100	3	-	-	3
414445	Elective IV	03	-	-	30	70	-	-	-	100	3	-	-	3
414446	Lab Practice III	-	04	-	-	-	25	-	25	50	-	2	-	2
414447	Lab Practice IV	-	02	-	-	-	25	25	-	50	-	1	-	1
414448	Project Stage-I	-	-	02	-	-	50	-	-	50	-	-	2	2
414449	Audit Course7													
								Total Credit			15	03	02	20
	Total	15	06	02	150	350	100	25	25	650	15	03	02	20

Elective III:	Elective IV:
• Mobile Computing • High Performance Computing • Multimedia Technology • Smart Computing	• Bioinformatics • Introduction to DevOps • Computer Vision • Wireless Communications
Lab Practice-III:	Lab Practice-IV:
It is based on subjects: • Information and Storage Retrieval	It is based on subjects: • Deep Learning

Audit Courses 7:

- 414449A: Copyrights and Patents
- 414449B: Stress Management by Yoga
- 414449C: English for Research Paper Writing

Course Code	Course Name	Teaching Scheme (Hours/week)			Examination Scheme and Marks						Credit Scheme			
		Lecture	Practical	Tutorial	Mid-Sem	End-Sem	Teamwork	Practical	Oral	Total	Lecture	Practical	Tutorial	Total
414450	Distributed Systems	03	-	-	30	70	-	-	-	100	03			03
414451	Elective V	03	-	-	30	70	-	-	-	100	03			03
414452	Elective VI	03	-	-	30	70	-	-	-	100	03			03
414453	Startup and Entrepreneurship	-	-	03	-	-	50	-	-	50	-	-	03	03
414454	Lab Practice V	-	04	-	-	-	50	25	-	75		02		02
414455	Lab Practice VI	-	02	-	-	-	25	-	50	75		01		01
414456	Project Stage II	-	10	-	-	-	100	-	50	150		05		05
414457	AuditCourse8													
	Total Credit										09	08	03	20
	Total	09	16	03	90	210	225	50	75	650	09	08	03	20

Elective V:	Elective VI:
• **Software Defined Networks** • **Social Computing** • **Natural Language Processing** • **Soft Computing** • **Game Engineering**	• **Ethical Hacking and Security** • **Augmented and Virtual Reality** • **Business Analytics and Intelligence** • **Blockchain Technology**
Lab Practice V: It is based on subjects: • **Distributed Systems**	**Lab Practice VI:** It is based on subjects: • **Elective VI**

Audit Courses 8:
- **414457A: Functional Programming in Haskell**
- **414457B: Cyber Laws and Use of Social Media**
- **414457C: Constitution of India**

<table>
<tr><td colspan="3" align="center">

Savitribai Phule Pune University, Pune
Final Year Information Technology (2019 Course)
<mark>414448: Project Stage I</mark>

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<tr><td>

Teaching Scheme:

</td><td>

Credit Scheme:

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Examination Scheme:

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Tutorial (TUT): 02 hrs/week

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02 Credits

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Term Work: 50 Marks

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</table>

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.

<table>
<tr><td colspan="3" align="center">**Savitribai Phule Pune University, Pune**
B.E Information Technology (2019 Course)
414449A: Audit Course 7
Copyrights and Patents</td></tr>
<tr><td>**Teaching Scheme:**</td><td align="center">**Credit Scheme:**</td><td>**Examination Scheme:**</td></tr>
<tr><td>**Theory(TH): 01 hrs/week**</td><td align="center">**Non-Credit**</td><td>**Audit Course**</td></tr>
</table>

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.

<table>
<tr><td colspan="3" align="center">

Savitribai Phule Pune University, Pune
B.E Information Technology (2019 Course)
414449B: Audit Course 7
Stress Management By Yoga
</td></tr>
</table>

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.

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COURSE CONTENTS
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<tr><td align="center">

Unit I
</td><td align="center">

Introduction to Stress
</td><td align="center">

(03 hrs)
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<tr><td colspan="3">

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.
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Mapping of Course Outcomes for Unit I
</td><td colspan="2">

CO1
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<tr><td align="center">

Unit II
</td><td align="center">

Introduction to Yoga
</td><td align="center">

(03 hrs)
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<tr><td colspan="3">

Meaning and definition of Yoga – aims & objectives of yoga, Definitions of Eight parts of yog. (Ashtanga), Concept of Stress according to Yoga.
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Mapping of Course Outcomes for Unit II
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CO2
</td></tr>
<tr><td align="center">

Unit III
</td><td align="center">

Asan and Pranayam
</td><td align="center">

(03 hrs)
</td></tr>
<tr><td colspan="3">

Asan - Various yog poses and their benefits for mind & body.

Pranayam - Regularization of breathing techniques and its effects-Types of pranayam.
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Mapping of Course Outcomes for Unit III
</td><td colspan="2">

CO3
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<tr><td align="center">

Unit IV
</td><td align="center">

Effect of Yoga
</td><td align="center">

(03 hrs)
</td></tr>
<tr><td colspan="3">

Impact of Yoga on Muscular system, Respiratory System, Circulatory system,Nervous system, Digestive system and Endocrine system
</td></tr>
<tr><td>

Mapping of Course Outcomes for Unit IV
</td><td colspan="2">

CO4
</td></tr>
</table>

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	
B.E Information Technology (2019 Course)	
414449C: Audit Course 7	
English for Research Paper Writing	

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

Prerequisite Courses, if any:

Course Objectives:

1. To improve writing skills and level of readability.
2. Learn about what to write in each section.
3. Summarize the skills needed when writing a research paper.
4. To study the good quality of paper at very first-time submission.

Course Outcomes:

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

CO1. Understand that how to improve writing skills and level of readability.

CO2. Identify and categorize about what to write in each section.

CO3. Ensure the good quality of paper at very first-time submission.

COURSE CONTENTS		
Unit I	**Introduction to Research Paper Writing**	**(03hrs)**

Planning and Preparation, Word Order, breaking up long sentences, Structuring Paragraphs and Sentences, Being Concise and Removing Redundancy, Avoiding Ambiguity and Vagueness.

Mapping of Course Outcomes for Unit I	**CO1**

Unit II	**Presentation Skills**	**(03 hrs)**

Clarifying Who Did What, Highlighting Your Findings, Hedging and Criticizing, Paraphrasing and Plagiarism, Sections of a Paper, Abstracts, Introduction.

Mapping of Course Outcomes for Unit II	**CO2**

Unit III	**Writing Problem Solution - Texts**	**(03 hrs)**

Key skills are needed when writing a Title, key skills are needed when writing an Abstract, key skills are needed when writing an Introduction, skills needed when writing a Review of the Literature.Skills are needed when writing the Methods, skills needed when writing the Results, skills are needed when writing the Discussion, and skills are needed when writing the Conclusions.

Mapping of Course Outcomes for Unit III	**CO2, C03**

Unit IV	**VERIFICATION SKILLS**	**(03 hrs)**

Useful phrases, checking Plagiarism, how to ensure paper is as good as it could possibly be the first- time submission.

Mapping of Course Outcomes for Unit IV	CO3

Textbooks:

1) Day R (2006) How to Write and Publish a Scientific Paper, Cambridge University Press Model Curriculum of Engineering & Technology PG Courses [Volume -II]
2) Goldbort R (2006) Writing for Science, Yale University Press
3) Highman N (1998), Handbook of Writing for the Mathematical Sciences, SIAM. Highman's book.
4) Adrian Wallwork , English for Writing Research Papers, Springer New York Dordrecht HeidelbergLondon, 2011
5) https://nptel.ac.in/courses/110105091

Evaluation

Students should select any one of the topics in a group of 3 to 5. Students should submit a written research Report /paper or make a presentation on the topic. Report/Presentation will be evaluated by the faculty as per rubrics defined by them at start of course.

SEMESTER – VIII

<table>
<tr><td colspan="3" align="center">**Savitribai Phule Pune University, Pune**
Final Year Information Technology (2019 Course)
414453: Startup and Entrepreneurship</td></tr>
<tr><td>**Teaching Scheme:**</td><td>**Credit Scheme:**</td><td>**Examination Scheme:**</td></tr>
<tr><td>**Tutorial (TUT) : 03 hrs/week**</td><td>**03 Credits**</td><td>**TW: 50 Marks**</td></tr>
</table>

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

<table>
<tr><td colspan="3" align="center">**Savitribai Phule Pune University, Pune**
Final Year Information Technology (2019 Course)
<mark>**414456 : Project-II**</mark></td></tr>
<tr><td>**Teaching Scheme:**</td><td>**Credit Scheme:**</td><td>**Examination Scheme:**</td></tr>
<tr><td>**Practical: 10 hrs/week**</td><td>**05 Credits**</td><td>**Term Work : 100 Marks**
Oral : 50 Marks</td></tr>
</table>

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:

<table>
<tr><td colspan="3" align="center">**Savitribai Phule Pune University, Pune**
B.E Information Technology (2019 Course)
414457B: Audit Course 8
Cyber Laws And Use Of Social Media</td></tr>
<tr><td>**Teaching Scheme:**</td><td>**Credit Scheme:**</td><td>**Examination Scheme:**</td></tr>
<tr><td>**Theory (TH): 01 hrs/week**</td><td>**Non-Credit**</td><td>**Audit Course**</td></tr>
</table>

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.

<table>
<tr><td colspan="3" align="center">**COURSE CONTENTS**</td></tr>
<tr><td align="center">**Unit I**</td><td align="center">**Introduction to IT Act**</td><td align="center">**(03 hrs)**</td></tr>
<tr><td colspan="3">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</td></tr>
<tr><td>**Mapping of Course Outcomes for Unit I**</td><td colspan="2">**CO1**</td></tr>
<tr><td align="center">**Unit II**</td><td align="center">**Cyber Law: International Perspective**</td><td align="center">**(03 hrs)**</td></tr>
<tr><td colspan="3">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</td></tr>
<tr><td>**Mapping of Course Outcomes for Unit II**</td><td colspan="2">**CO2**</td></tr>
<tr><td align="center">**Unit III**</td><td align="center">**Cyber Forensic and Computer Crimes**</td><td align="center">**(03 hrs)**</td></tr>
<tr><td colspan="3">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.</td></tr>
<tr><td>**Mapping of Course Outcomes for Unit III**</td><td colspan="2">**CO3**</td></tr>
<tr><td align="center">**Unit IV**</td><td align="center">**Use of Social Media**</td><td align="center">**(03 hrs)**</td></tr>
</table>

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="3" align="center">

Savitribai Phule Pune University, Pune
B.E Information Technology (2019 Course)
414457C: Audit Course 8
Constitution Of India

</td></tr>
<tr><td>**Teaching Scheme:**</td><td>**Credit Scheme:**</td><td>**Examination Scheme:**</td></tr>
<tr><td>**Theory(TH): 01 hrs/week**</td><td align="center">**Non-Credit**</td><td>**Audit Course**</td></tr>
</table>

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.

<table>
<tr><td colspan="3" align="center">**COURSE CONTENTS**</td></tr>
<tr><td align="center">**Unit I**</td><td align="center">**History of Making of the Indian Constitution**</td><td align="center">**(03 hrs)**</td></tr>
<tr><td colspan="3">History Drafting Committee, (Composition & Working), Philosophy of the Indian Constitution: Preamble, Salient Features</td></tr>
<tr><td>**Mapping of Course Outcomes for Unit I**</td><td colspan="2">**CO1**</td></tr>
<tr><td align="center">**Unit II**</td><td align="center">**Contours of Constitutional Rights & Duties**</td><td align="center">**(03 hrs)**</td></tr>
<tr><td colspan="3">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.</td></tr>
<tr><td>**Mapping of Course Outcomes for Unit II**</td><td colspan="2">**CO2**</td></tr>
<tr><td align="center">**Unit III**</td><td align="center">**Organs of Governance:**</td><td align="center">**(03 hrs)**</td></tr>
<tr><td colspan="3">Parliament, Composition, Qualifications and Disqualifications, Powers and Functions, Executive, President, Governor, Council of Ministers, Judiciary</td></tr>
<tr><td>**Mapping of Course Outcomes for Unit III**</td><td colspan="2">**CO3**</td></tr>
<tr><td align="center">**Unit IV**</td><td align="center">**Local Administration and Election Commission**</td><td align="center">**(03 hrs)**</td></tr>
</table>

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.