**FACULTY OF ENGINEERING**

**Syllabus**

**B.E. (Information Technology) 2015 Course**

**(With effect from Academic Year 2018-2019)**

**SAVITRIBAI PHULE PUNE UNIVERSITY**

**The syllabus is prepared by**

**B.O.S. in Information Technology, Savitribai Phule Pune University**

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## PROGRAM EDUCATIONAL OBJECTIVES

The students of Information Technology course after passing out will

1. Graduates of the program will possess strong fundamental concepts in mathematics, science, engineering and Technology to address technological challenges with emerging trends.
2. Possess knowledge and skills in the field of Computer Science & Engineering and Information Technology for analyzing, designing and implementing multifaceted engineering problems of any domain with innovative and efficient approaches.
3. Acquire an attitude and aptitude for research, entrepreneurship and higher studies in the field of Computer Science & Engineering and Information Technology.
4. Learn commitment to ethical practices, societal contributions through communities and life-long intellect.
5. Attain better communication, presentation, time management and team work skills leading to responsible & competent professionals and will be able to address challenges in the field of IT at global level.

## PROGRAM OUTCOMES

The students in the Information Technology course will attain:

1. An ability to apply knowledge of computing, mathematics including discrete mathematics as well as probability and statistics, science, engineering and technology.
2. An ability to define a problem and provide a systematic solution with the help of conducting experiments, as well as analyzing and interpreting the data.
3. An ability to design, implement, and evaluate a software or a software/hardware co-system, component, or process to meet desired needs within realistic constraints.
4. An ability to identify, formulate, and provide systematic solutions to complex engineering problems.
5. An ability to use the techniques, skills, and modern engineering technologies tools, standard processes necessary for practice as a IT professional.
6. An ability to apply mathematical foundations, algorithmic principles, and Information Technology theory in the modeling and design of computer-based systems with necessary constraints and assumptions.
7. An ability to analyze the local and global impact of computing on individuals, organizations and society.
8. An ability to understand professional, ethical, legal, security and social issues and responsibilities.
9. An ability to function effectively as an individual or as a team member to accomplish a desired goal(s).
10. An ability to engage in life-long learning and continuing professional development to cope up with fast changes in the technologies/tools with the help of electives, professional organizations and extra-curricular activities.
11. An ability to communicate effectively in engineering community at large by means of effective presentations, report writing, paper publications, demonstrations.
12. An ability to understand engineering, management, financial aspects, performance, optimizations and time complexity necessary for professional practice.
13. An ability to apply design and development principles in the construction of software systems of varying complexity.

## B.E. (Information Technology) 2015 Course to be implemented from Academic Year 2018-19

SEMESTER-I

| Subject Code | Subject | Teaching Scheme | | | Examination Scheme | | | | | Total Marks | Credits |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Lecture | Practical | Tutorial | In-Sem | TW | PR | OR | End-Sem | | |
| 414453 | Information and Cyber Security | 3 | -- | -- | 30 | -- | -- | -- | 70 | 100 | 3 |
| 414454 | Machine Learning and Applications | 4 | -- | -- | 30 | -- | -- | -- | 70 | 100 | 4 |
| 414455 | Software Design and Modeling | 3 | -- | -- | 30 | -- | -- | -- | 70 | 100 | 3 |
| 414456 | Elective-I | 3 | -- | -- | 30 | -- | -- | -- | 70 | 100 | 3 |
| 414457 | Elective -II | 3 | -- | -- | 30 | -- | -- | -- | 70 | 100 | 3 |
| 414458 | Computer Laboratory-VII | -- | 4 | -- | -- | 50 | 50 | -- | -- | 100 | 2 |
| 414459 | Computer Laboratory-VIII | -- | 4 | -- | -- | 50 | -- | 50 | -- | 100 | 2 |
| 414460 | Project Phase-I | -- | -- | 2 | -- | -- | -- | 50 | -- | 50 | 2 |
| 414461 | Audit Course-V | -- | -- | -- | -- | -- | -- | -- | -- | Grade | |
| Total | | 16 | 8 | 2 | 150 | 100 | 50 | 100 | 350 | 750 | 22 |
| Total of Part-I | | 26 | | | | 750 | | | | | |

**Abbreviations: TW:** Term Work **TH:** Theory **OR:** Oral **PR**: Practical **Sem**: Semester
Computer Laboratory-VII (Information and Cyber Security+ Machine Learning and Application)
Computer Laboratory-VIII (Software Design and Modeling)

| Elective I | | Elective II | |
|---|---|---|---|
| 414456 A | 1. Wireless Communications | 414457A | 1. Software Defined Networks |
| 414456B | 2. Natural Language Processing | 414457B | 2. Soft Computing |
| 414456C | 3. Usability Engineering | 414457C | 3. Software Testing and Quality Assurance |
| 414456D | 4. Multicore and Concurrent Systems | 414457D | 4. Compiler Construction |
| 414456E | 5. Business Analytics and Intelligence | 414457E | 5. Gamification |

| Audit Course-V | |
|---|---|
| 414461A | 1. Emotional Intelligence |
| 414461B | 2. Green Computing |
| 414461C | 3. Critical Thinking |
| 414461D | 4. Statistical Learning model using R. |

SEMESTER –II

| Subject Code | Subject | Teaching Scheme | | | Examination Scheme | | | | | Total Marks | Credits |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Lecture | Practical | Tutorial | In-Sem | TW | PR | OR | End-Sem | | |
| 414462 | Distributed Computing System | 3 | -- | -- | 30 | -- | -- | -- | 70 | 100 | 3 |
| 414463 | Ubiquitous Computing | 3 | -- | -- | 30 | -- | -- | -- | 70 | 100 | 3 |
| 414464 | Elective-III | 3 | 2 | -- | 30 | 25 | -- | 25 | 70 | 150 | 4 |
| 414465 | Elective-IV | 3 | -- | -- | 30 | -- | -- | -- | 70 | 100 | 3 |
| 414466 | Computer Laboratory-IX | -- | 4 | -- | -- | 50 | 50 | -- | -- | 100 | 2 |
| 414467 | Computer Laboratory-X | -- | 2 | -- | -- | 25 | -- | 25 | -- | 50 | 1 |
| 414468 | Project Work | -- | -- | 6 | -- | 50 | -- | 100 | -- | 150 | 6 |
| 414469 | Audit Course-VI | -- | -- | -- | -- | -- | -- | -- | -- | Grade | |
| Total | | 12 | 8 | 6 | 120 | 150 | 50 | 150 | 280 | 750 | 22 |
| Total of Part-II | | 26 | | | | 750 | | | | | |

**Abbreviations: TW:** Term Work **TH:** Theory **OR:** Oral **PR**: Practical **Sem**: Semester
Computer Laboratory-IX (Distributed Computing System)
Computer Laboratory-X (Ubiquitous Computing)

| Elective III | | Elective IV | |
|---|---|---|---|
| 414464A | 1. Internet of Things (IoT) | 414465A | 1. Rural Technologies and Community Development |
| 414464B | 2. Information storage and retrieval | 414465B | 2. Parallel Computing |
| 414464C | 3. Multimedia Techniques | 414465C | 3. Computer Vision |
| 414464D | 4. Internet and Web Programming | 414464D | 4. Social Media Analytics |
| 414464E | 5. Computational Optimization | 414465E | 5. Open Elective |

| Audit Course-VI | |
|---|---|
| 414469A | 1. IoT – Application in Engineering field |
| 414469B | 2. Entrepreneurship |
| 414469C | 3. Cognitive Computing |
| 414469D | 4. AI and Robotics |