Hon. Shri. Babanrao Pachpute Vichardhara Trust's

group of institutions

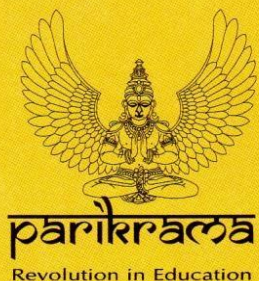Kashti, Tal - Shrigonda, Dist-Ahmednagar, Maharashtra - 414 701

Faculty of Engineering

parikrama
Revolution in Education

Approved by AICTE, MS (New-Int)-Engg./2009/09, Dt. 15/06/09, Affiliated to Savitribai Phule Pune University

Third Year of Computer Engineering (2019 Course)

Savitribai Phule Pune University Third Year of Computer Engineering (2019 Course) 310241: Database Management Systems		
Teaching Scheme: **TH: 03** **Hours/Week**	**Credit: 03**	**Examination Scheme:** **Mid-Sem (TH) : 30 Marks** **End-Sem (TH): 70 Marks**
Prerequisites Courses: Discrete Mathematics (210241), Data Structures and Algorithms (210252)		
Companion Course: Database Management Systems Laboratory (310246)		
Course Outcomes: On completion of the course, learners should be able to **CO1:** Analyze and design Database Management System using ER model **CO2:** Implement database queries using database languages **CO3:** Normalize the database design using normal forms **CO4:** Apply Transaction Management concepts in real-time situations **CO5:** Use NoSQL databases for processing unstructured data **CO6:** Differentiate between Complex Data Types and analyze the use of appropriate data types		

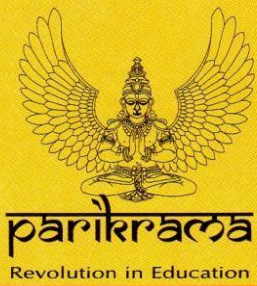| Savitribai Phule Pune University Third Year of Computer Engineering (2019 Course) 310242: Theory of Computation		
Teaching Scheme: **TH: 03** **Hours/Week**	**Credit: 03**	**Examination Scheme:** **Mid-Sem (TH) : 30 Marks** **End-Sem (TH): 70 Marks**
Prerequisites Courses: Discrete Mathematics (210241)		
Companion Course: --		
Course Outcomes: After completion of the course, learners should be able to **CO1**: Understand formal language, translation logic, essentials of translation, alphabets, language representation and apply it to design Finite Automata and its variants **CO2**: Construct regular expression to present regular language and understand pumping lemma for RE **CO3**: Design Context Free Grammars and learn to simplify the grammar **CO4**: Construct Pushdown Automaton model for the Context Free Language **CO5**: Design Turing Machine for the different requirements outlined by theoretical computer science **CO6**: Understand different classes of problems, classify and analyze them and study concepts of NP completeness		

Hon. Shri. Babanrao Pachpute Vichardhara Trust's

group of institutions

Kashti, Tal - Shrigonda, Dist-Ahmednagar, Maharashtra - 414 701

Faculty of Engineering

parikrama
Revolution in Education

Approved by AICTE, MS (New-Int)-Engg./2009/09, Dt. 15/06/09, Affiliated to Savitribai Phule Pune University

Savitribai Phule Pune University
Third Year of Computer Engineering (2019 Course)
310243: Systems Programming and Operating System

Teaching Scheme: **TH: 03** **Hours/Week**	**Credit: 03**	**Examination Scheme:** **Mid-Sem (TH) : 30 Marks** **End-Sem (TH): 70 Marks**

Prerequisites Courses: Programming and Problem solving (110005),
Data Structures and Algorithms (210252),
Principles of Programming Languages (210255),
Microprocessor (210254)

Companion Course: Laboratory Practice I (310248)

Course Outcomes:

On completion of the course, learners should be able to

CO1: Analyze and synthesize basic System Software and its functionality.

CO2: Identify suitable data structures and Design & Implement various System Software

CO3: Compare different loading schemes and analyze the performance of linker and loader

CO4: Implement and Analyze the performance of process scheduling algorithms

CO5: Identify the mechanism to deal with deadlock and concurrency issues

CO6: Demonstrate memory organization and memory management policies

Savitribai Phule Pune University
Third Year of Computer Engineering (2019 Course)
310244: Computer Networks and Security

Teaching Scheme: **TH: 03** **Hours/Week**	**Credit: 03**	**Examination Scheme:** **Mid-Sem (TH) : 30 Marks** **End-Sem (TH): 70 Marks**

Prerequisites Courses: --

Companion Course: Computer Networks and Security Laboratory (310247)

Course Outcomes:

On completion of the course, learners should be able to

CO1: Summarize fundamental concepts of Computer Networks, architectures, protocols and technologies

CO2: Illustrate the working and functions of data link layer

CO3: Analyze the working of different routing protocols and mechanisms

CO4: Implement client-server applications using sockets

CO5: Illustrate role of application layer with its protocols, client-server architectures

CO6: Comprehend the basics of Network Security

Hon. Shri. Babanrao Pachpute Vichardhara Trust's

group of institutions

Kashti, Tal - Shrigonda, Dist-Ahmednagar, Maharashtra - 414 701

Faculty of Engineering

parikrama
Revolution in Education

Approved by AICTE, MS (New-Int)-Engg./2009/09, Dt. 15/06/09, Affiliated to Savitribai Phule Pune University

Savitribai Phule Pune University
Third Year of Computer Engineering (2019 Course)
Elective I
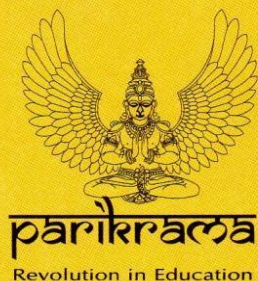### 310245(A): Internet of Things and Embedded Systems

Teaching Scheme: TH: 03 Hours/Week	Credit: 03	Examination Scheme: Mid-Sem (TH) : 30 Marks End-Sem (TH): 70 Marks

Prerequisites Courses: Computer Networks and Security (310244)

Companion Course: Laboratory Practice I (310248)

Course Outcomes:

On completion of the course, learners should be able to

    CO1: Understand the fundamentals and need of Embedded Systems for the Internet of Things

    CO2: Apply IoT enabling technologies for developing IoT systems

    CO3: Apply design methodology for designing and implementing IoT applications

    CO4: Analyze IoT protocols for making IoT devices communication

    CO5: Design cloud based IoT systems

   **CO6:** Design and Develop secured IoT applications

Hon. Shri. Babanrao Pachpute Vichardhara Trust's

group of institutions

Kashti, Tal - Shrigonda, Dist-Ahmednagar, Maharashtra - 414 701

Faculty of Engineering

parikrama
Revolution in Education

Approved by AICTE, MS (New-Int)-Engg./2009/09, Dt. 15/06/09, Affiliated to Savitribai Phule Pune University

Savitribai Phule Pune University Third Year of Computer Engineering (2019 Course) 310251: Data Science and Big Data Analytics		
Teaching Scheme: TH: 03 Hours/Week	Credit: 03	Examination Scheme: Mid-Sem (TH) : 30 Marks End-Sem (TH): 70 Marks

Prerequisites Courses: Discrete Mathematics (210241),
Database Management Systems (310341)

Companion Course: Data Science and Big Data Analytics Laboratory (310256)

Course Outcomes:

After completion of the course, learners should be able to

CO1: Analyze needs and challenges for Data Science Big Data Analytics

CO2: Apply statistics for Big Data Analytics

CO3: Apply the lifecycle of Big Data analytics to real world problems

CO4: Implement Big Data Analytics using Python programming

CO5: Implement data visualization using visualization tools in Python programming

CO6: Design and implement Big Databases using the Hadoop ecosystem

Savitribai Phule Pune University Third Year of Computer Engineering (2019 Course) 310252: Web Technology		
Teaching Scheme: TH: 03 Hours/Week	Credit: 03	Examination Scheme: Mid-Sem (TH) : 30 Marks End-Sem (TH): 70 Marks

Prerequisites Courses: Database Management Systems (310341),
Computer Networks and Security (310244)

Companion Course: Web Technology Laboratory (310257)

Course Outcomes:

On completion of the course, learners should be able to

CO1: Implement and analyze behavior of web pages using HTML and CSS

CO2: Apply the client side technologies for web development

CO3: Analyze the concepts of Servlet and JSP

CO4: Analyze the Web services and frameworks

CO5: Apply the server side technologies for web development

CO6: Create the effective web applications for business functionalities using latest web development platforms
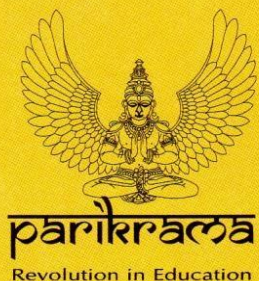
Hon. Shri. Babanrao Pachpute Vichardhara Trust's

group of institutions

Kashti, Tal - Shrigonda, Dist-Ahmednagar, Maharashtra - 414 701

Faculty of Engineering

parikrama
Revolution in Education

Approved by AICTE, MS (New-Int)-Engg./2009/09, Dt. 15/06/09, Affiliated to Savitribai Phule Pune University

Savitribai Phule Pune University
Third Year of Computer Engineering (2019 Course)
310253: Artificial Intelligence

Teaching Scheme: TH: **03** Hours/Week	Credit: **03**	Examination Scheme: Mid-Sem (TH) : **30 Marks** End-Sem (TH): **70 Marks**

Prerequisites Courses: Programming and Problem solving (110005),
Data Structures and Algorithms (210252)

Companion Course: Laboratory Practice II (310258)

Course Outcomes:

After completion of the course, students should be able to

- **CO1:** Identify and apply suitable Intelligent agents for various AI applications
- **CO2:** Build smart system using different informed search / uninformed search or heuristic approaches
- **CO3:** Identify knowledge associated and represent it by ontological engineering to plan a strategy to solve given problem
- **CO4:** Apply the suitable algorithms to solve AI problems
- **CO5:** Implement ideas underlying modern logical inference systems
- **CO6:** Represent complex problems with expressive yet carefully constrained language of representation

Savitribai Phule Pune University
Third Year of Computer Engineering (2019 Course)
Elective II 310254(A): Information Security

Teaching Scheme: TH: **03** Hours/Week	Credit: **03**	Examination Scheme: Mid-Sem (TH) : **30 Marks** End-Sem (TH): **70 Marks**

Prerequisites Courses: -- Computer Networks and Security (310244)

Companion Course: -- Laboratory Practice II (310258)

Course Outcomes:

On completion of the course, learners should be able to

- **CO1:** Model the cyber security threats and apply formal procedures to defend the attacks
- **CO2:** Apply appropriate cryptographic techniques by learning symmetric and asymmetric key cryptography
- **CO3:** Design and analyze web security solutions by deploying various cryptographic techniques along with data integrity algorithms
- **CO4:** Identify and Evaluate Information Security threats and vulnerabilities in Information systems and apply security measures to real time scenarios
- **CO5:** Demonstrate the use of standards and cyber laws to enhance Information Security in the development process and infrastructure protection