

**Savitribai Phule Pune University**

**Fourth Year of E & TC Engineering (2019 Course) 404181:**

**Radiation and Microwave Theory**

<b>Teaching Scheme:</b>	<b>Credit</b>	<b>Examination Scheme:</b>
<b>Theory: 03 Hrs. / Week</b>	<b>03</b>	<b>In-Sem (Theory): 30 Marks</b> <b>End Sem (Theory): 70 Marks</b>

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

**CO1: Apply** the fundamentals of electromagnetic to derive free space propagation equation and distinguish various performance parameters of antenna.

**CO2: Identify** various modes in the waveguide. Compare: coaxial line, rectangular waveguides & striplines and identify applications of the same.

**CO3: Explore** construction and working of principles passive microwave devices/components.

**CO4: Explore** construction and working of principles active microwave devices/components.

**CO5: Analyze** the structure, characteristics, operation, equivalent circuits and applications of various microwave solid state active devices.

**CO6: Know** the various microwave systems, device set ups of microwave measurement devices and Identify the effect of radiations on environmental sustainability.

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**Fourth Year of E & TC Engineering (2019 Course) 404182: VLSI**

**Design and Technology**

<b>Teaching Scheme:</b>	<b>Credit</b>	<b>Examination Scheme:</b>
<b>Theory: 03 Hrs. / Week</b>	<b>03</b>	<b>In-Sem (Theory): 30 Marks</b> <b>End Sem (Theory): 70 Marks</b>

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

**CO1: Develop** effective HDL codes for digital design.

**CO2: Apply** knowledge of real time issues in digital design.

**CO3: Model** digital circuit with HDL, simulate, synthesis and prototype in PLDs.

**CO4: Design** CMOS circuits for specified applications.

**CO5: Analyze** various issues and constraints in design of an ASIC.

**O6: Apply** knowledge of testability in design and Build In Self Test (BIST) circuit.

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**Fourth Year of E & TC Engineering (2019 Course) 404183:**

**Cloud Computing**

<b>Teaching Scheme:</b>	<b>Credit</b>	<b>Examination Scheme:</b>
<b>Theory: 03 Hrs. / Week</b>	<b>03</b>	<b>In-Sem (Theory): 30 Marks</b> <b>End Sem (Theory): 70 Marks</b>

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

**CO1: Understand** the basic concepts of Cloud Computing.

**CO2: Describe** the underlying principles of different Cloud Service Models.

**CO3: Classify** the types of Virtualization.

**CO4: Examine** the Cloud Architecture and understand the importance of Cloud Security.

**CO5: Develop** applications on Cloud Platforms.

**CO6: Evaluate** distributed computing and the Internet of Things.

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**Fourth Year of E & TC Engineering (2019 Course) 404184 (E):**

**Modernized IoT (Elective - III)**

<b>Teaching Scheme:</b>	<b>Credit</b>	<b>Examination Scheme:</b>
<b>Theory: 03 Hrs. / Week</b>	<b>03</b>	<b>In-Sem (Theory): 30 Marks</b> <b>End-Sem (Theory): 70 Marks</b>

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

**CO1: Comprehend** and analyze concepts of sensors, actuators, IoT and IoE.

**CO2: Interpret** IoT Architecture Design Aspects.

**CO3: Comprehend** the operation of IoT protocols.

**CO4: Describe** various IoT boards, interfacing, and programming for IoT.

**CO5: Illustrate** the technologies, Catalysts, and precursors of IIoT using suitable use cases.

**CO6: Provide** suitable solution for domain specific applications of IoT.

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**Fourth Year of E & TC Engineering (2019 Course)**

**404185 (B): Electronics Product Design (Elective - IV)**

<b>Teaching Scheme:</b>	<b>Credit</b>	<b>Examination Scheme:</b>
<b>Theory: 03 Hrs. / Week</b>	<b>03</b>	<b>In-Sem (Theory): 30 Marks</b> <b>End Sem (Theory): 70 Marks</b>

**Course Outcomes:** On completion of the course, learner will be able to **CO1: Understand** and explain design flow of design of electronics product. **CO2: Associate** with various circuit design issues and testing.

**CO3: Inferring** different software designing aspects and the Importance of product test & test specifications.

**CO4: Summarizing** printed circuit boards and different parameters.

**CO5: Estimating** assorted product design aspects.

**CO6: Exemplifying** special design considerations and importance of documentation.

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**Fourth Year of E & TC Engineering (2019 Course) 404190:**

**Fiber Optic Communication**

<b>Teaching Scheme:</b>	<b>Credit</b>	<b>Examination Scheme:</b>
<b>Theory: 03 Hrs. / Week</b>	<b>03</b>	<b>In-Sem (Theory): 30 Marks</b> <b>End Sem (Theory): 70 Marks</b>

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

- CO1: Explain** the working of components and measurement equipments in optical fiber networks.
- CO2: Calculate** the important parameters associated with optical components used in fiber optic telecommunication systems.
- CO3: Compare** and contrast the performance of major components in optical links.
- CO4: Evaluate** the performance viability of optical links using the power and rise time budget analysis.
- CO5: Design** digital optical link by proper selection of components and check its viability using simulation tools.
- CO6: Compile** technical information related to state of art components, standards, simulation tools and current technological trends by accessing the online resources to update their domain knowledge.

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**Fourth Year of E & TC Engineering (2019 Course) 404191**

**(E): Mobile Computing (Elective - V)**

<b>Teaching Scheme:</b>	<b>Credit</b>	<b>Examination Scheme:</b>
<b>Theory: 03 Hrs. / Week</b>	<b>03</b>	<b>In-Sem (Theory): 30 Marks</b> <b>End Sem (Theory): 70 Marks</b>

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

**CO1: Understand** concepts of Mobile Communication.

**CO2: Analyse** next generation Mobile Communication System.

**CO3: Understand** network layers of Mobile Communication.

**CO4: Understand** IP and Transport layers of Mobile Communication.

**CO5: Study** of different mathematical models.

**CO6: Understand** different mobile applications.

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**Fourth Year of E & TC Engineering (2019 Course) 404192**

**(D): Digital Marketing (Elective - VI)**

<b>Examination Scheme:</b>	<b>Credit</b>	<b>Examination Scheme:</b>
<b>Theory: 03 Hrs. / Week</b>	<b>03</b>	<b>In-Sem: 30 Marks</b> <b>End Sem: 70 Marks</b>

**Course Outcomes:** On completion of the course, learner will be able to  
**CO1: Design** websites using free tools like Wordpress and explore it for digital marketing.  
**CO2: Apply** various keywords for a website & to perform SEO.  
**CO3: Understand** the various SEM Tools and implement the Digital Marketing Tools.  
**CO4: Illustrate** the use of Facebook, Instagram and Youtube for Digital Marketing in real life.  
**CO5: Use** Linked in platform for various campaigning.  
**CO6: Understand** the importance of recent trends in digital marketing.