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**List of Topics Covered**

<b>UNIT I</b>	<b>AUTOMOBILE ELECTRICALS AND ELECTRONICS</b>	<b>8</b>
Basic Electrical Components and their operation in an automobile- Starting systems, Charging systems-ignition systems- Electronic fuel control-Environmental legislation for pollution- Overview of vehicle electronic systems-Power train subsystem-chassis subsystem-comfort and safety subsystems.		
<b>UNIT II</b>	<b>INTRODUCTION TO EMBEDDED SYSTEMS</b>	<b>8</b>
Embedded Systems definition- Components of Embedded systems-Microprocessor- Classification of Microprocessors-Microcontrollers-Memory -Peripherals. Introduction to an embedded board (TMS470 based/ARM9 based) for hands on lab sessions (RISC processor based with standard peripherals /interfaces and I/Os)		
<b>UNIT III</b>	<b>OPERATING SYSTEM IN EMBEDDED ENVIRONMENT</b>	<b>7</b>
Introduction to OS- General Purpose OS, RTOS-, Kernel- Pre-emptive & Non pre-emptive, Scheduler, Interrupt-Interrupt latency and Context Switch Latency- Board Support package, Task-Multi-tasking, Task synchronization, Inter-task communication, Features of a typical embedded RTOS ( $\mu$ C/OS-II)		
<b>UNIT III</b>	<b>INTEGRATED DEVELOPMENT ENVIRONMENT</b>	<b>8</b>
Integrated Development Environment (IDE)- Getting Started, Hardware/Software Configuration (Boot Service, Host- Target Interaction), Booting, Reconfiguration, Managing IDE, Target Servers, Agents, Cross-Development, debugging- Introduction to an IDE for the lab board- RTOS, PC based debugger.		
<b>UNIT IV</b>	<b>EMBEDDED SYSTEM IN AUTOMOTIVE APPLICATIONS</b>	<b>10</b>
Engine Management systems- Diesel/Gasoline systems, Various sensors used in system- Vehicle safety systems- electronic control of braking and traction- Introduction to control elements and control methodology- Electronic transmission control- Body electronics- Infotainment systems- Navigation systems- system level tests- Software calibration using engine and vehicle dynamometers- Environmental tests for electronic control units.		
<b>UNIT V</b>	<b>EMBEDDED SYSTEM COMMUNICATION PROTOCOLS</b>	<b>4</b>
Introduction to Control networking- Communication protocols in embedded systems- SPI, I <sup>2</sup> C, USB, -Vehicle communication protocols - Introduction to CAN, LIN, FLEXRAY, MOST, KWP2000-Details of CAN		