

Code	Subject Title	Total Credits	Theory Credits	Practical Credits
PGDESD101	<p>Programming Languages for Embedded Systems and Concepts Object oriented design: Object orientation design methodology.ADT and object orientation. Study of Advanced C Concepts: Basic C concepts, arrays, pointers, structure, union, Enumerations command line arguments, searching and sorting algorithm, Self referential structure, stack, queue link list. Object oriented concepts: ADT, Class, object, Constructor ,Destructor Encapsulation, Inheritance, Polymorphism, Function overloading, Function overriding, Exception handling, Templates, Operator overloading, Virtual functions, Abstract class Embedded Systems: Embedded System programming ,Function like macros, super loop concept, delay functions, code optimization, memory saving techniques. SDLC Basics: Waterfall Model, V model, Agile model) STLC Basics: Software testing techniques.</p>	11	5	6
PGDESD102	<p>Real Time Operating Systems RTOS Concepts: What is Real time?, Difference between process and task, multitasking, Scheduling, Memory management, Synchronization, Semaphore ,Mutex, Critical Section, Deadlock, Priority inversion, Priority Inheritance, Interrupts , RTOS configuration. 8051 Microcontroller based RTOS Configuration: Learning RTOS Application programming Interface(API) and design Microcontroller based RTOS concepts application. PIC(16F877A) Microcontroller based RTOS Configuration: Learning RTOS Application programming Interface(API) and design Microcontroller based RTOS concepts application. ARM(LPC2148) Microcontroller based RTOS Configuration: Learning RTOS Application programming Interface(API) and design Microcontroller based RTOS concepts application.</p>	2	1	1

PGDESD103	Embedded System Programming C++ Application development : Code optimization, Memory Saving technique.	4	2	2
PGDESD104	Linux Basics + Operating System + Device Drivers Processor Architecture, Process management, Scheduling, Memory management Inter process communication, Linux internals, System programming in Linux, Shell scripting, File API, Process API, Multithreading, driver development	9	4	5
PGDESD105	8/16/32 bit microcontroller and interfacing Study of 8 bit Microcontroller architectures, Interfacing concepts of new devices like LCD, Motors, Relay, Digital and Analog Sensors, Wireless and Wi-Fi devices. Assembly language Programming, Embedded C programming, study of sensor analog as well as digital. ADC, DAC. Study of 32 bit ARM architecture, ARM assembly language programming and Embedded C programming and Application development.	5	2	3
PGDESD106	Embedded System Hardware Design Study of data sheets: Hardware device interface with Microcontroller will require to study data sheets of the device, Selection of components, Power supply design. Microcontroller based application hardware design as per specification will be done.	2	1	1
PGDESD107	Embedded System Protocols -RS-232,I2C,SPI,CAN RS232:Communication between PC and Microcontroller (UART/USART) will be performed using RS232 Protocol. I2C,SPI:RTC chips, EEPROM chips, Digital sensors interfacing will be done using I2C and SPI protocol. CAN: Electronic control unit communication (ECU) will done using CAN.	2	1	1
	Project Work 5 months duration project	5	2	3
		40	18	22
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	Extra Credits			
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PGDESD108	Internet of Things (IoT) Sensors Fundamentals, Basic concept of internet of things, wireless communication protocols like Bluetooth, Zigbee. study of Wi-Fi and chips like ESP8266 interfacing with microcontroller.	1	0	1
PGDESD109	Automotive Domain Basics Study of Automotive Protocols (CAN, LIN) in detail and implementation. Introduction to MATLAB model development, SIMULINK.	1	1	0
PGDESD110	Case studies For Standard Chips, used in industry for above Protocols. Case study of standard chips like RTC chip DS1307,EEPROM, 24LC256, Temperature Sensor TC74 which are based on I2C,SPI protocols	1	0	1
PGDESD111	Soft Skills Communication Skills Personality development Interpersonal Skills Business Etiquettes Preparation for Placement Time management Confidence Building	1	1	0
	SubTotal hrs and Credits (Extra Credits)	4	2	2
	Grand Total	44	20	24
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