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| Course Number and Name | | | | | | | | | | | | |
| BEI 605- Embedded Systems Design | | | | | | | | | | | | |
| Credits and Contact Hours | | | | | | | | | | | | |
| 3 and 45 | | | | | | | | | | | | |
| Course Coordinator's Name | | | | | | | | | | | | |
| Ms S.Philomina | | | | | | | | | | | | |
| Text Books and References | | | | | | | | | | | | |
| Text Books: | | | | | | | | | | | | |
| 1. James K.Peckol, "Embedded system Design", John Wiley & Sons, 2010 | | | | | | | | | | | | |
| Reference: | | | | | | | | | | | | |
| 1. Elicia White, "Making Embedded Systems", O'Reilly Series, SPD, 2011 | | | | | | | | | | | | |
| 2. Rajkamal,"Embedded Systems", TMH, 2009. | | | | | | | | | | | | |
| 3. Lyla B Das," Embedded Systems-An Integrated Approach", Pearson2013 5. Arnold S. Berger – "Embedded System Design", CMP books, USA 2002 | | | | | | | | | | | | |
| Course Description | | | | | | | | | | | | |
| <ul style="list-style-type: none"> To introduce the Building Blocks of Embedded System To Educate in Various Embedded Development Strategies To Introduce Bus Communication in processors, Input/output interfacing. To impart knowledge in various processor scheduling algorithms. To introduce Basics of Real time operating system and example tutorials to discuss on one real time operating system tool | | | | | | | | | | | | |
| Prerequisites | | | | | | Co-requisites | | | | | | |
| Microprocessor and Microcontroller | | | | | | NIL | | | | | | |
| required, elective, or selected elective (as per Table 5-1) | | | | | | | | | | | | |
| selected elective | | | | | | | | | | | | |
| Course Outcomes (COs) | | | | | | | | | | | | |
| CO1: Acquire a basic knowledge about fundamentals of microcontrollers | | | | | | | | | | | | |
| CO2: Acquire a basic knowledge about programming and system control to perform a specific task. | | | | | | | | | | | | |
| CO3: Acquire knowledge about devices and buses used in embedded networking | | | | | | | | | | | | |
| CO4: Develop programming skills in embedded systems for various applications. | | | | | | | | | | | | |
| CO5: Acquire knowledge about basic concepts of circuit emulators. | | | | | | | | | | | | |
| CO6: Acquire knowledge about Life cycle of embedded design and its testing. | | | | | | | | | | | | |
| Student Outcomes (SOs) from Criterion 3 covered by this Course | | | | | | | | | | | | |
| | COs/SOs | a | b | c | d | e | f | g | h | i | j | k |
| | CO1 | M | M | M | H | M | | M | | | L | L |
| | CO2 | H | M | M | H | H | | M | | | L | L |
| | CO3 | H | M | | H | H | | M | | | L | L |
| | CO4 | H | M | | H | H | | M | | | L | L |
| | CO5 | H | M | M | H | H | | M | | | L | L |
| | CO6 | H | | | H | H | | M | | | L | L |

List of Topics Covered

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| UNIT-I EMBEDDED DESIGN WITH MICROCONTROLLERS | 9 |
| Product specification – Hardware / Software partitioning – Detailed hardware and software design – Integration – Product testing – Microprocessor Vs Micro Controller – Performance tools– RTOS Micro Controller -issues in selection of processors. | |
| UNIT-II PARTITIONING DECISION | 9 |
| Hardware / Software duality – Hardware-Software portioning- coding for Hardware- software development – ASIC revolution – Managing the Risk – Co-verification – execution environment – memory organization –memory enhancement – Firmware-speed and code density -System startup. | |
| UNIT-III FUNCTIONALITIES FOR SYSTEM DESIGN | 9 |
| Timers, Watch dog timers – RAM, Flash Memory basic toolset – Integration of Hardware & Firmware- in System Programming, in Application Programming, IDE-Target Configuration- Host based debugging – Remote debugging – ROM emulators – Logic analyzer. | |
| UNIT-IV CIRCUIT EMULATORS | 9 |
| Buller proof run control – Real time trace – Hardware break points – Overlay memory – Timing constraints – Usage issues – Triggers. | |
| UNIT-V EMBEDDED DESIGN LIFE CYCLE & TESTING | 9 |
| Objective, Need, different Phases & Modeling of the EDLC, choice of Target Architectures for Embedded Application Development-for Control Dominated-Data Dominated Systems- Software &Hardware Design, PCB Design, Manufacturing & PCB Assembly-Bug tracking – reduction of risks & costs – Performance – Unit testing – Regression testing – Choosing test cases – Functional tests – Coverage tests – Testing embedded software – Performance testing – Maintenance. | |