# COMPUTER SCIENCE & ENGINEERING (BTECH)

***COURSE CURRICULUM FOR THE NEW PROGRAMME (B.Tech..) w.e.f. 2007 BATCH***

**Semester I**

| Course code | Course Name | Credit Structure | | | |
|---|---|---|---|---|---|
| | | **L** | **T** | **P** | **C** |
| CH 103+ | Chemistry | **2** | **1** | **0** | **6** |
| CS 101 | Computer Programming | **2** | **0** | **2** | **6** |
| HS 101 | Economics | **3** | **0** | **0** | **6** |
| MA 105 | Calculus | **3** | **1** | **0** | **8** |
| PH 103* | Electricity and Magnetism | **2** | **1** | **0** | **6** |
| PH 105* | Modern Physics | **2** | **1** | **0** | **6** |
| CH 117+ | Chemistry Lab | **0** | **0** | **3** | **3** |
| ME 113* | Workshop Practice | **0** | **1** | **3** | **5** |
| ME 119* | Engineering Graphics and Drawing | **1** | **0** | **3** | **5** |
| PH 117+ | Physics Lab | **0** | **0** | **3** | **3** |
| | | | | | |
| NC 101# | National Cadet Corps (NCC) | **0** | **0** | **0** | **P/NP** |
| NO 101# | National Sports Organization (NSS) | **0** | **0** | **0** | **P/NP** |
| NS 101# | National Service Scheme (NSS) | **0** | **0** | **0** | **P/NP** |

* Any one of these two courses and any one of these Lab courses only for **D3 D4**

\+ Only for D1 D2

\# Any one of these three P/NP courses

**Semester – II**

| Course Code | Course Name | Credit Structure | | | |
|---|---|---|---|---|---|
| | | **L** | **T** | **P** | **C** |
| MA 106 And MA 108 | Linear Algebra and Ordinary Differential Equations I | **3** | **1** | **0** | **8** |
| CH 103+ | Chemistry | **2** | **1** | **0** | **6** |
| PH 103* | Electricity and Magnetism | **3** | **0** | **0** | **6** |
| PH 105* | Modern Physics | **2** | **1** | **0** | **6** |
| CS 152 | Department Introductory Course | **3** | **0** | **0** | **6** |
| IC 102 | Data Analysis and Interpretations | **2** | **1** | **0** | **6** |
| CH 117* | Chemistry Lab. | **0** | **0** | **3** | **3** |
| ME 113+ | Workshop Practice | **0** | **1** | **3** | **5** |
| ME 119+ | Engineering Graphics and Drawing | **0** | **1** | **3** | **5** |
| PH 117* | Physics Lab. | **0** | **0** | **3** | **3** |
| CS 154 | Abstractions and Paradigms in Programming Lab | **0** | **0** | **3** | **3** |
| NC 102# | National Cadet Corps (NCC) | **0** | **0** | **0** | **P/NP** |
| NO 102# | National Sports Organization (NSS) | **0** | **0** | **0** | **P/NP** |
| NS 102# | National Service Scheme (NSS) | **0** | **0** | **0** | **P/NP** |

* Any one of these two courses and any one of these Lab courses only for **D1 D2**

\+ Only for D3 D4

\# Any one of these three P/NP courses

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### Semester III

| Course code | Course Name | Credit Structure | | | |
|---|---|---|---|---|---|
| | | **L** | **T** | **P** | **C** |
| ES 200 And HS 200 | Environmental Studies: Science and Engg And Environmental Studies | **3** **3** | **0** **0** | **0** **0** | **3** **3** |
| EE 101 | Introduction to Electrical and Electronic Circuits | **3** | **1** | **0** | **8** |
| CS 207 | Discrete Structures | **3** | **0** | **0** | **6** |
| CS 213 | Data Structures and Algorithms | **3** | **0** | **0** | **6** |
| IC 211 | Experimentation and Measurement Lab | **0** | **0.5** | **3** | **4** |
| CS 293 | Data Structures and Algorithms Lab | **0** | **0** | **3** | **3** |
| | | | | | **33** |
| COURSES FOR HONOR REQUIREMENT | | | | | |
| | | | | | |
| | | | | | |
| COURSES FOR MINOR REQUIREMENT | | | | | |
| CS 207 | Discrete Structures | **3** | **0** | **0** | **6** |

### Semester –IV

| Course Code | Course Name | Credit Structure | | | |
|---|---|---|---|---|---|
| | | **L** | **T** | **P** | **C** |
| MA 214 | Numerical Analysis | **3** | **1** | **0** | **8** |
| CS 208 | Automata Theory and Logic | **3** | **0** | **0** | **6** |
| CS 218 | Design and Analysis of Algorithms | **3** | **0** | **0** | **6** |
| CS 210 | Logic Design | **3** | **0** | **0** | **6** |
| CS 296 | Software Systems Lab | **2** | **0** | **2** | **6** |
| CS 288 | Logic Design Lab | **0** | **0** | **3** | **3** |
| | | | | | **35** |
| COURSES FOR HONOR REQUIREMENT | | | | | |
| | CSE Elective | **3** | **0** | **0** | **6** |
| | | | | | |
| COURSES FOR MINOR REQUIREMENT | | | | | |
| CS 213 | Data Structures and Algorithms | **3** | **0** | **0** | **6** |

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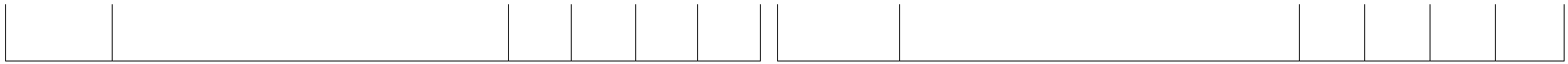
***COURSE CURRICULUM FOR THE NEW PROGRAMME (B.Tech.) w.e.f. 2007 BATCH***

### Semester V

| Course code | Course Name | Credit Structure | | | |
|---|---|---|---|---|---|
| | | **L** | **T** | **P** | **C** |
| HS 301/<br>HS 303/<br>HS 305/<br>HS 307 | Philosophy/<br>Psychology/<br>Literature/<br>Sociology | **3** | **0** | **0** | **6** |
| CS 305 | Computer Architecture | **3** | **0** | **0** | **6** |
| CS 347 | Operating Systems | **3** | **0** | **0** | **6** |
| CS 317 | Database and Information Systems | **3** | **0** | **0** | **6** |
| CS 387 | Database and Information Systems Lab | **0** | **0** | **3** | **3** |
| CS 341 | Computer Architecture Lab | **0** | **0** | **3** | **3** |
| CS 377 | Operating Systems Lab | **0** | **0** | **3** | **3** |
| | | | | | **33** |
| COURSES FOR HONOR REQUIREMENT | | | | | |
| | CSE Elective | | | | |
| COURSES FOR MINOR REQUIREMENT | | | | | |
| CS 348 | Computer Networks | **3** | **0** | **0** | **6** |

### Semester –VI

| Course Code | Course Name | Credit Structure | | | |
|---|---|---|---|---|---|
| | | **L** | **T** | **P** | **C** |
| CS 344 | Artificial Intelligence | **3** | **0** | **0** | **6** |
| CS 302 | Implementation of Programming Languages | **3** | **1** | **0** | **8** |
| CS 348 | Computer Networks | **3** | **0** | **0** | **6** |
| CS 386 | Artificial Intelligence Lab | **0** | **0** | **3** | **3** |
| CS 306 | Implementation of Programming Languages Lab | **0** | **0** | **3** | **3** |
| CS 378 | Computer Networks Lab | **0** | **0** | **3** | **3** |
| CS 308 | Embedded Systems Lab | **1** | **0** | **2** | **4** |
| | | | | | **33** |
| COURSES FOR HONOR REQUIREMENT | | | | | |
| CS 492 | CSE Elective/<br>BTP I | | | | |
| COURSES FOR MINOR REQUIREMENT | | | | | |
| CS 317 | Data Base and Information Systems | | | | |



**COMPUTER SCIENCE & ENGINEERING**

***COURSE CURRICULUM FOR THE NEW PROGRAMME (B.Tech) w.e.f. 2007 BATCH***

| **Semester VII** | | | | | | **Semester –VIII** | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Course code** | **Course Name** | **Credit Structure** | | | | **Course Code** | **Course Name** | **Credit Structure** | | | |
| | | **L** | **T** | **P** | **C** | | | **L** | **T** | **P** | **C** |
| | Elective 1 | **3** | **0** | **0** | **6** | | Elective 4 | **3** | **0** | **0** | **6** |
| | Elective 2 | **3** | **0** | **0** | **6** | | Elective 5 | **3** | **0** | **0** | **6** |
| | Elective 3 | **3** | **0** | **0** | **6** | | Elective 6 | **3** | **0** | **0** | **6** |
| | Institute Elective 1 | **3** | **0** | **0** | **6** | | Institute Elective 2 | **3** | **0** | **0** | **6** |
| | | | | | **24** | | | | | | **24** |
| COURSES FOR HONOR REQUIREMENT | | | | | | COURSES FOR HONOR REQUIREMENT | | | | | |
| CS 492<br>CS 496 | CSE Elective/<br>BTP I/<br>BTP 2 | | | | | CS 496 | CSE Elective/<br>BTP 2 | | | | |
| | CSE Elective | | | | | | CSE Elective | | | | |
| COURSES FOR MINOR REQUIREMENT | | | | | | COURSES FOR MINOR REQUIREMENT | | | | | |
| CS 344 | Artificial Intelligence | | | | | CS 463 | Design and Analysis of Algorithms | **3** | **0** | **0** | **6** |
| | | | | | | | | | | | |

We plan to teach CS207 Discrete Structures and CS 213 Data Structures and Algorithms every year. Four other CSE theory core courses would be offered as Minor courses in any two year cycle.

CS 213 is pre-requisite for all Minor courses except for CS 207 Discrete Structures. The Minor courses listed in the schedule from Semester 6 to 8 are given as a sample.

Course Proposal

| | | |
|---|---|---|
| i | Title of the course | CS xxx Introduction to Embedded Systems (Lab) |
| ii | Credit Structure | L T P C<br><br>1 0 2 4 |
| iii | Prerequisite, if any (for the students | Knowledge of programming using C and some system level programming. |
| iv | Course content (Separate sheet may be used, if necessary) | Introduction to embedded systems as distinct from conventional programming systems, Programming paradigms for embedded systems such as Real-time Operating Systems (RTOS) vs conventional operating systems, Esterel, Statecharts, etc.<br><br>Introduction to microcontrollers, Interfacing digital sensors and other devices, Timers/Counters, speed control by generating pulse width modulation (PWM), interfacing analog sensors and A-to-D conversion.<br><br>Autonomous Robot Programming: White Line Following and Adaptive Cruise Control, Realtime systems and RTOS on robot with a simple application. |
| v | Texts/References (Separate sheet may be used, if necessary) | 1. Embedded Systems Design – A Unified Hardware/ Software Introduction, by Vahid and Givargis , Wiley, 2002.<br><br>2. Data-sheets related to robots and related devices. |
| vi | Instructor(s) name | |
| vii | Name of other departments to whom the course is relevant | Mechanical Engineering, Electrical Engineering, Systems & Control |

| | | |
|---|---|---|
| viii | Justification | Embedded systems are going to be as ubiquitous as PCs are today. Our course uses robots to motivate the study of embedded systems. Many CS students will be building digitally controlled systems embedded into environments where the traditional boundaries between hardware and software dissolve. This is already true with applications that embed components/ sub-systems such as SoCs, FPGAs, etc. By the end of the course our students should be able to build drivers and applications for artifacts such as automatic greenhouses, autonomous robots, and the many yet to be invented devices that they might help invent in future. |