|  |
| --- |
| IUT_LOGO**IUT_LOGO**  **ISLAMIC UNIVERSITY OF TECHNOLOGY**  **Course Outline and Course Plan**  **CSE 4205: Digital Logic Design** |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Name of the Teacher** | **Md. Hamjajul ASHMAFEE** | | | **Position** | | **Lecturer** | | |
| **Department** | **CSE** | | | **Programme** | | **B.Sc. Engg.** | | |
| **Course Code** | **CSE 4205** | | | **Course Title** | | **Digital Logic Design** | | |
| **Academic Year** | **2016-2017** | | | **Semester** | | **Summer** | | |
| **Contact Hours** | **3** | | | **Credit Hours** | | **3.00** | | |
| **Text books and Reference books (if any)** | **1. Digital Logic and Computer Design, (3rd Ed.) 2. Digital fundamentals 3. Digital Electronics: Principles, Devices and Applications 4. Fundamentals of Logic Design 5. Digital Electronics: A Practical Approach with VHDL** | | | **Authors of the books** | | **1. M. Morris Mano 2. Thomas L. Floyd 3. Anil K. Maini 4. C. H. Roth, Jr. and L. L. Kinney 5. William Kleitz** | | |
| **Prerequisites**  **(If any)** | **Number systems, Basic Electricals and Electronics** | | | | | | | |
| **Course Homepage**  **√** | [**ftp://10.220.20.26/ACADEMIC/CSE/CSE 4205**](ftp://10.220.20.26/academic/CSE/CSE%204205)  **√**  **√**  **√** | | | | | | | |
| **Teaching Methods/**  **Approaches** | **Lecture** | **Group discussion** | | | **Demonstration** | | | **Problem solving** |
| **Project** | **Others:**  **√**  **√** | | | | | | |
| **Teaching aids** | **Multi-media** | | **OHP** | | **Board and Marker** | | **Others** | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Course Assessment Method** | | | | | | | | |
| **Attendance (10%)** | **Quiz 15% of Total Marks (Best 3 out of 4)** | | | | | | **Mid Semester (25%)** | **Semester Final (50%)** |
|  | **1st Quiz** | **2nd Quiz** | **3rd Quiz** | **4th Quiz** | **Others** | | **Week/Date** | **Week/Date** |
| **Week/Date** | **Week/Date** | **Week/Date** | **Week/Date** | **Assignment** | **Homework** |
| **4th week** | **8th week** | **12th week** | **16th week** | **Along the course** | **Along the course** | **August** | **October** |

|  |  |
| --- | --- |
| **Course Contents** | |
| Number system and Codes: General way of representing numbers, decimal, binary, octal and hexadecimal number systems and their representation, conversion of number from one system to another. Compliment in number system. Different Codes: BCD, Alphanumeric, Gray, Excess-3, ASCII and error detection codes. Digital Logic: Boolean algebra, De-Morgan’s Theorem logic gates and their truth tables. Canonical form of logic expression.  Simplification of logic expression: Algebraic method, K-Map and Quine-McClauskey method. Realization by using NAND/NOR gates.  Classification of logic systems: Combinational logic system. Combinational logic design using MSI and LSI. Adders, subtractors, Code Converters. Magnitude Comparator Encoder, Decoder, Multiplexer, De-multiplexer, ROM, RAM, Programmable logic Array (PLA), D/A and A/D converters with applications. Different types of digital storage media.  Sequential logic system: Flip-Flops, clocked RS, JK, Master Slave JK, D-type, T-type, Flip-Flops, Flip-Flop Design. Sequential logic Registers: Different types of Registers and their applications. Counters and their simplified design. | |
|  | |
| **Course Objective** | **Attainment of PEO** |
| **Able to apply disciplinary concluding, critical thinking, and hands-on skills to identify, analyse and solve problems. (Technology)** | PEO1 |
| **Capable of communicating effectively in both oral and written form to articulate technical knowledge, ideas, and proposals. (Communication)** | PEO3 |
| **Carry out effectively, think independently and perform collaboratively in a team environment in a membership or leadership role. (Management &/or Teamwork)** | PEO3 |

|  |  |
| --- | --- |
| **Course Outcome** | **Attainment of SO** |
| **Achievement of selection and application capability of knowledge, techniques, skills, and modern tools of the discipline to broadly-defined engineering technology activities** | a |
| **Achievement of selection and application capability of knowledge of mathematics, science, engineering, and technology to engineering technology problems that require the application of principles and applied procedures or methodologies** | b |
| **Accomplishment of ability to design systems, components, or processes for broadly-defined engineering technology problems appropriate to program educational objectives** | d |
| **Helpful for performing as a member or leader on a technical team** | e |
| **Being expert to identify, analyse, and solve broadly-defined**  **engineering technology problems** | f |
| **A commitment to quality, timeliness, and**  **continuous improvement** | k |

|  |  |  |
| --- | --- | --- |
| **Weekly plan for course content** | | |
| **Weeks** | **Topics** | **Task/Reading** |
| **1** | Number system and Codes: General way of representing numbers, decimal, binary, octal and hexadecimal number systems and their representation conversion of number from one system to another. Compliment in number system. Different Codes and error detection codes. |  |
| **2** | BCD Codes, Digital Logic: Boolean algebra, De-Morgan’s Theorem logic gates and their truth tables. |  |
| **3** | Canonical form of logic expression. Simplification of logic expression. |  |
| **4** | Simplification of logic expression: Algebraic method, K-Map and Quine-McClauskey method. |  |
| **5** | Realization by using NAND/NOR gates. |  |
| **6** | Combinational logic system. Combinational logic design using MSI & LSI. |  |
| **7** | Adders, subtractors, Code Converters. Magnitude Comparator Encoder, Decoder. |  |
| **8** | Multiplexer, De-multiplexer, D/A & A/D converters with applications. |  |
| **9** | ROM, RAM, Programmable logic, Array (PLA). Different types of digital storage media. |  |
| **10** | Sequential logic system: Flip-Flops, clocked RS, JK flip-flops |  |
| **11** | Master Slave JK, D-type, T-type, Flip-Flops, Flip-Flop Design |  |
| **12** | Sequential logic Registers: Different types of Registers and their applications. |  |
| **13** | Counters and their simplified design. |  |
| **14** | Review Class. |  |

Student’s consulting hour: Students can seek prior appointment.

NOTE: A good start is needed. This course is very fundamental for the students who want to continue job/research in Computer design, Robotics etc. Simulation software for designing different logic gates will also be exercised. Students can form study group to solve the problems

**Instructor contact details:**

Md. Hamjajul Ashmafee

Room No. 502

Academic Building 2

Computer Science and Engineering Department

Islamic University of Technology (IUT)

Board Bazar, Gazipur-1704, Bangladesh.

Office Phone: +880-2-9291254 – 59 (Ext. 3355)

E-mail: ashmafee@iut-dhaka.edu