**ICS 2205 DIGITAL LOGIC (45 CONTACT HOURS)**

**Pre-requisite:** *ICS 2200 Analogue Electronics*

**Course Purpose**

This course aims at enabling students to differentiate the construction, types, uses and perform basic calculation for the following; gates, combinational logic and sequential logic.

**Learning Outcomes**

At the end of this course, the student should be able to;

* Demonstrate the use of the different devices in computer hardware design
* Use logic gates to design combinational and sequential circuits
* Discuss the construction and operation of counters.

**Course Description**

Number systems: decimal, binary, hexadecimal. Conversion from one number system to another. Codes; BCD, ASCII. Applications of codes. Signal; analogue, digital, logic levels; logic gates; AND, OR, INVERTER. Truth tables, Boolean Algebra, Karnaugh Maps, Logic circuits; Standard gate symbols; combinational logic, Universal gates; NAND, NOR, EXOR. ICs and applications. Basic Digital Electronic Devices: Counters; Flip flops; S-R, D, Latches, J-K. Binary counters; parallel, serial. Decade counter. Encoder and decoders. Multiplexers and demultiplexers. Displays: LEDs, LCDs 7 segment display. Memory: Terminology; Bit, Byte, Word Nibble, data address. Registers, RAM, ROM, EPROM, EEPROM. Signal conditioning: transducers, sensors, actuator, and amplifiers/driver circuits.

**Teaching Methodology**

Lectures, class and group discussions and research assignments will be an integral part of this course.

**Instructional Materials/Equipment**

Digital Electronics lab, overhead projector

**Course Assessment**

30% Continuous Assessment (Tests 10%, Assignment 10%, Practical 10%)

70% End of Semester Examination.

**Course Textbooks**

1. Puri (1997), Digital Electronics: Circuits and Systems: Circuits and Systems, Tata

McGraw-Hill, ISBN: 67-876-089

1. Roger L. Tokheim (2007), Digital Electronics: Principles and Applications, McGraw-Hill

Education, 7th Edition, ISBN: 678-9878

1. Anil Kumar Maini (2007), Digital Electronics: Principles, Devices and Applications,

McGraw-Hill, illustrated Edition, ISBN: 987-78676

**Reference Textbooks:**

1. William H. Gothmann (1982), Digital Electronics: An Introduction to Theory and

Practice, Prentice-Hall, 2nd Edition, ISBN: 675-98465

1. Roger L. Tokheim (1999), Digital Electronics, McGraw-Hill Education, 5th Edition, ISBN: 56-08977
2. Stephen Brown, Fundamentals of Digital Logic with Verilog Design. McGraw-Hill 2nd Edition, ISBN: 674-823718

**Course Journals**

1. Advances in data Analysis and Classification ISSN 1862-5347
2. Annals Of software Engineering ISSN 1022-7091
3. Acta Informatica ISSN 0001-5903
4. Advances in Computational Mathematics ISSN 1019-7168

**Reference Journals**

1. Journal of computer science and Technology ISSN 1000-9000
2. Journal of Science and Technology ISSN 1860-4749
3. Central European Journal Of Computer Science ISSN 1896-1533
4. Cluster computing ISSN 1386-7857