<table>
<tr><td>Course Title</td><td colspan="5">Digital Systems</td></tr>
<tr><td>Course Code</td><td colspan="5">ETECH 130</td></tr>
<tr><td>Course Type</td><td colspan="5">Compulsory</td></tr>
<tr><td>Level</td><td colspan="5">First Cycle</td></tr>
<tr><td>Year / Semester</td><td colspan="5">First Year / Fall</td></tr>
<tr><td>Teacher’s Name</td><td colspan="5">Kallinikos Tsolias</td></tr>
<tr><td>ECTS</td><td>6</td><td>Lectures / week</td><td>3</td><td>Laboratories / week</td><td>One 3 hour lab per semester</td></tr>
<tr><td>Course Purpose and Objectives</td><td colspan="5">The main objectives of the course are to:
• Introduce fundamental digital concepts and principles that are commonly used in the analysis and design of digital systems
• Introduce and explain the operation of fundamental logic gates that comprise the building blocks of complex digital circuits
• Present and demonstrate through examples techniques and mathematical models/tools that are used in the analysis and design of logic circuits
• Design and test fundamental digital blocks that perform specific functions
• Use fundamental digital blocks for the design of more complex digital systems including registers, sequential counters, memories, A/D and D/A converters</td></tr>
<tr><td>Learning Outcomes</td><td colspan="5">After completion of the course students are expected to:
• Use and be able to apply the binary and hexadecimal number systems including operation of basic logic gates
• Be able to utilize digital design tools such as Boolean algebra and Karnaugh maps and analyse, design and optimize digital systems that perform important fundamental functions
• Determine the concept of state machines and be able to use appropriate techniques for the design of sequential circuits
• Be able to use digital fundamental building blocks (e.g., flip flops) for the design of more complex digital systems including shift registers, memories, A/D and D/A converters</td></tr>
<tr><td>Prerequisites</td><td colspan="2">None</td><td colspan="2">Required</td><td>None</td></tr>
<tr><td>Course Content</td><td colspan="5">• Digital concepts, pulse waveforms
• Binary and hexadecimal systems, basic arithmetic operations, digital codes
• Logic gates, Boolean algebra and rules, simplification of Boolean expressions
• SOP and POS minimization using Karnaugh maps
• Combinational logic circuits and digital system design
• Adders, comparators, decoders, encoders, code converters, multiplexers, demultiplexers, parity generators/checkers
• Latches, edge-triggered flip flops, flip-flop applications</td></tr>
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	• Finite state machines and design of sequential circuits • Counters, shift registers, and memories • Analog-to-digital and digital-to-analog conversion
Teaching Methodology	Lectures, in-class examples, exercises, practical.
Bibliography	<u>Compulsory</u> • Thomas L. Floyd (2008), Digital Fundamentals, Prentice Hall, ISBN:0132359235 • Lecturers notes. <u>Suggested</u>
Assessment	Homework: 10% Participation: 10% Laboratory: 20% Mid Term: 20% Final Exam: 40%
Language	Greek