

# INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

NAME OF DEPT./CENTRE: **Electronics and Computer Engineering**

1. Subject Code: **EC - 262** Course Title: **Digital Hardware Lab**

2. Contact Hours: **L: 0 T: 0 P: 4**

3. Examination Duration (Hrs.): **Theory**

0	0
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**Practical**

0	2
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4. Relative Weight: **CWS**

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**PRS**

50
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**MTE**

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**ETE**

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**PRE**

50
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5. Credits: 

0	2
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 6. Semester 

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**Autumn**

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**Spring**

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**Both**

7. Pre-requisite: **EC - 203**

8. Subject Area: **DCC**

9. Objective: To provide hands-on experience on the various building blocks of digital circuits.

10. Details of the Course:

Sl. No.	Contents	Contact Hours
	Truth table verification of basic TTL and CMOS gates, and multiplexers and demultiplexers. Realization of switching functions with gates and multiplexers. Study and operation of 7-segment display, and decoder-driver. Design of binary and BCD adders. Design and testing of switch debouncers. Study of RS, JK master-slave, and D and T flip-flops. Operation of BCD, decade, mod-N, and up-down counters. Study of shift registers, and design of ring counters. Design of TTL- and 555-based multivibrators, timers and clock circuits. Study of ALU and RAM.  <i>Basic programming of 8085 microprocessor.</i>  <i>Simple I/O exercises using 8255.</i>	14 x 4
	<b>Total</b>	<b>56</b>

11. Suggested Books:

<b>Sl. No</b>	<b>Name of Books/ Authors</b>	<b>Year of Publication</b>
1.	Mano, M.M. and Ciletti, M.D., "Digital Design", 4 <sup>th</sup> Ed., Prentice-Hall.	2006
2.	Jain, R.P., "Modern Digital Electronics", 3 <sup>rd</sup> Ed., Tata McGraw-Hill.	2003
3.	Gaonkar, R.S., "Microprocessor Architecture, Programming and Applications", 5 <sup>th</sup> Ed., Penram International.	2007