



NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

DEPARTMENT OF ELECTRICAL AND ELECTRONICS  
ENGINEERING

COURSE PLAN – PART I			
Name of the programme and specialization	B.Tech- Electrical & Electronics Engineering		
Course Title	MICROPROCESSORS AND MICROCONTROLLERS		
Course Code	EEPC22	No. of Credits	3
Course Code of Pre-requisite subject(s)	EEPC14		
Session	January 2022	Section (if, applicable)	3 <sup>rd</sup> year B
Name of Faculty	Dr. Ankur Singh Rana	Department	EEE
Official Email	ankur@nitt.edu	Telephone No.	9910478111
Name of Course Coordinator(s) (if, applicable)			
Official E-mail		Telephone No.	
Course Type (please tick appropriately)	<input checked="" type="checkbox"/> Core course	<input type="checkbox"/> Elective course	
<b>Syllabus (approved in BoS)</b>			
<p>8-Bit Microprocessor - 8085 architecture and memory interfacing (RAM &amp; ROM), interfacing I/O devices- instruction set - addressing modes - assembly language programming – interrupts - timing diagram.</p> <p>8051 Microcontroller - Intel 8051 architecture, memory organization, flags, stack, and special function registers, I/O, ports - connecting external memory, counters and timers, serial data I/O, Interrupts.</p> <p>Microcontroller instructions - addressing modes, moving data, logical operations, arithmetic operations, jump and call instructions – subroutines - Interrupts and returns.</p> <p>Microcontroller programming – Assembly Language Programming, timer and counter programming, connection to RS 232 and RS 485, Interrupt programming.</p> <p>Peripherals and interfacing - Serial and parallel I/O (8251 and 8255), Programmable DMA controller, Programmable interrupt controller, ADC/DAC interfacing.</p>			
<b>COURSE OBJECTIVES</b>			
To gain knowledge on the architecture of 8085 micro-processor and 8051 micro-controller, their programming and associated peripheral interface devices.			



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Course Outcomes	Programme Outcomes (PO)
1. Have a clear understanding of the architecture and instruction set of 8085 and 8051	2,6,8,9,13,14
2. Be able to interface peripherals and memories with 8085 and 8051.	2,3,6,8,9,13,14
3. Be able to understand the application of 8085 and 8051 in waveform generators.	2,3,6,8,9,13,14

COURSE PLAN – PART II			
COURSE OVERVIEW			
<p>This course offers an integrated treatment of both hardware and software aspects of 8085 microprocessor and 8051 microcontroller and also focuses on the basic concepts underlying programmable devices. Providing a sound pedagogy from basic concepts to applications. It prepares users to apply concepts learned to a variety of situations they may encounter in their future jobs. This course covers the hardware aspects of the microcomputer as a system using a spiral approach in exploring and re-exploring topics from various perspectives; introduces programming step by step, beginning with 8085 and 8051 instructions; examines programming techniques, program development, and software development systems; and integrates hardware and software concepts in interfacing and designing microprocessor and microcontroller based products.</p>			
COURSE TEACHING AND LEARNING ACTIVITIES			
S.No	Week/Contact Hours	Topic	Mode of Delivery
1	Week 1 19.01.2022 to 21.01.2022 3 Contact hour	Introduction to Microprocessor, 8-Bit Microprocessor 8085 architecture	Online Mode
2.	Week 2 24.01.2022 to 28.01.2022 2 Contact hours	8085 architecture and Pin Diagram	Online Mode
3.	Week 3 31.01.2022 to 04.02.2022 3 Contact hours	8085 memory interfacing (RAM & ROM), interfacing I/O devices	Online Mode
4.	Week 4 07.02.2022 to 11.02.2022 3 Contact hours	Instruction set - addressing modes Assembly language programming – interrupts - timing diagram.	Online Mode
5.	Week 5 14.02.2022 to 18.02.2022 3 Contact hours	Instruction set - addressing modes Assembly language programming – interrupts - timing diagram.	Online Mode



6.	Week 6 21.02.2022 to 25.02.2022 3 Contact hours	Instruction set - addressing modes Assembly language programming – interrupts - timing diagram.	Online Mode
7.	Week 7 28.02.2022 to 04.03.2022 3 Contact hours + 75 Minutes for CT1	8051 Microcontroller - Intel 8051 architecture, memory organization, <b>I<sup>st</sup> Class Test</b>	Online Mode
8.	Week 8 07.03.2022 to 11.03.2022 3 Contact hours	Flags, stack, and special function registers, I/O, ports Connecting external memory, counters and timers, serial data I/O, Interrupts	Online Mode
9.	Week 9 14.03.2022 to 17.03.2022 2 Contact hours	Microcontroller instructions - addressing modes, moving data, logical operations, arithmetic operations	Online Mode
10.	Week 10 21.03.2022 to 25.03.2022 0 Contact hours	<b>Academic break for all online classes</b>	
11.	Week 11 28.03.2022 to 01.04.2022 3 Contact hours	Microcontroller instructions - jump and call instructions – subroutines - Interrupts and returns.	Online Mode
12.	Week 12 04.04.2022 to 08.04.2022 3 Contact hours	Microcontroller programming – Assembly Language Programming, timer and counter	Online Mode
13.	Week 13 11.04.2022 to 13.04.2022 1 Contact hours	Assembly Language programming, connection to RS 232 and RS 485, Interrupt programming.	Online Mode
14.	Week 14 18.04.2022 to 22.04.2022 3 Contact hours + 75 Minutes for CT2	Peripherals and interfacing - Serial and parallel I/O (8251 and 8255) Programmable DMA controller Programmable interrupt controller <b>II<sup>nd</sup> Class Test</b>	Online Mode
15.	Week 15 25.04.2022 to 27.04.2022 1 Contact hours	ADC/DAC interfacing Compensation Assessment	Online Mode
16.	Week 16 28.04.2022 to 03.05.2022 3 Contact hours	Final Assessment (Lab courses)	
17.	Week 17/18 05.05.2022 to 18.05.2022	<b>Final Assessment</b>	



<b>COURSE ASSESSMENT METHODS</b>				
<b>S.No</b>	<b>Mode of Assessment</b>	<b>Week</b>	<b>Duration</b>	<b>% Weightage</b>
1	I <sup>st</sup> Class Test	Week 7	75 minutes	20
2	II <sup>nd</sup> Class Test	Week 14	75 minutes	20
3	Assignments/Surprisetest/ Attendance/projects/seminar	Throughout semester		30
CPA	Compensation Assessment	Week 15	75 minutes	20
4	Final Assessment	Week 17/18 10.05.2022 to 28.05.2022	120 minutes	30
<b>ESSENTIAL READINGS: Textbooks, Reference books, website address, journals, etc</b>				
<b>Text Books:</b>				
1. Ramesh S. Gaonkar, 'Microprocessor Architecture Programming and Applications with 8085', Penram Intl. Publishing, 6th Edition, 2013.				
2. Kenneth Ayala, 'The 8051 Microcontroller', Cengage Learning Publications, 3rd Edition, 2007.				
3. Muhammad Ali Mazidi, Janice Gillispie Mazidi, Rolin McKinlay 'The 8051 Microcontroller and Embedded Systems using Assembly and C', Prentice Hall Publications, 2nd Edition, 2008.				
<b>Reference Books:</b>				
1. Ray A.K., Bhurchandi K.M., 'Advanced Microprocessor and Peripherals', Tata McGraw-Hill Publications, 3rd Edition, 2013.				
2. Sencer Yeralan, Helen Emery, 'Programming and Interfacing the 8051 Microcontroller', Addison Wesley Publications, 1st Edition, 2000.				
3. Krishna Kant, 'Microprocessors and Microcontrollers, Architecture, Programming and System Design - 8085, 8086, 8051, 8096', Prentice Hall India Ltd Publications, 1st Edition, 2010.				
<b>COURSE EXIT SURVEY</b>				
<ul style="list-style-type: none"> <li>• Feedback from the students during class committee meetings</li> <li>• Anonymous feedback through questionnaire (Mid of the semester &amp; End of the semester)</li> <li>• End semester feedback on course outcomes</li> </ul>				
<b>COURSE POLICY (including compensation assessment to be specified)</b>				
<ol style="list-style-type: none"> <li>1. Attending all the assessments mandatory for every student</li> <li>2. One compensation assessment will be conducted for those students who are being absent for the assessment 1 and/or 2, only for the valid reason.</li> <li>3. At any case CPA will not be considered as an improvement test.</li> <li>4. Absolute/Relative grading will be adopted for the course.</li> </ol>				



**ATTENDANCE POLICY** (A uniform attendance policy as specified below shall be followed)

- At least 75% attendance in each course is mandatory.
- A maximum of 10% shall be allowed under On Duty (OD) category.
- Students with less than 65% of attendance shall be prevented from writing the final assessment and shall be awarded 'V' grade.

**ACADEMIC DISHONESTY & PLAGIARISM**

- Possessing a mobile phone, carrying bits of paper, talking to other students, copying from others during an assessment will be treated as punishable dishonesty.
- Zero mark to be awarded for the offenders. For copying from another student, both students get the same penalty of zero mark.
- The departmental disciplinary committee including the course faculty member, PAC chairperson and the HoD, as members shall verify the facts of the malpractice and award the punishment if the student is found guilty. The report shall be submitted to the Academic office.
- The above policy against academic dishonesty shall be applicable for all the programmes.

**ADDITIONAL INFORMATION, IF ANY**

**FOR APPROVAL**

  
Dr. Ankur Singh Rana

Course Faculty \_\_\_\_\_

  
S. Mageshwari 27/1/22  
CC- Chairperson (Dr. S. Mageshwari) HOD \_\_\_\_\_



**Guidelines**

- a) The number of assessments for any theory course shall range from 4 to 6.
- b) Every theory course shall have a final assessment on the entire syllabus with at least 30% weightage.
- c) One compensation assessment for absentees in assessments (other than final assessment) is mandatory. Only genuine cases of absence shall be considered.
- d) The passing minimum shall be as per the regulations.

B.Tech. Admitted in				P.G.
2018	2017	2016	2015	
35% or (Class average/2) whichever is greater.		(Peak/3) or (Class Average/2) whichever is lower		40%

- e) Attendance policy and the policy on academic dishonesty & plagiarism by students are uniform for all the courses.
- f) Absolute grading policy shall be incorporated if the number of students per course is less than 10.
- g) Necessary care shall be taken to ensure that the course plan is reasonable and is objective.