

NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

This course outline template acts as a guide for writing your course outline. As every course is different, please feel free to amend the template/ format to suit your requirements.

COURSE OUTLINE TEMPLATE			
Course Title	COMPUTER ARCHITECTURE AND ORGANIZATION		
Course Code	ECPE23	No. of Credits	3
Department	ECE	Faculty	R.Thilagavathy
Pre-requisites Course Code	ECPC18 Microprocessors and Microcontrollers		
Course Coordinator(s) (if, applicable)			
Other Course Teacher(s)/Tutor(s) E-mail	thilagavathy@nitt.edu	Telephone No.	0431-2503313
Course Type	<input type="checkbox"/> Core course	<input checked="" type="checkbox"/> Elective course	
COURSE OVERVIEW			
<p>This course provides a short introduction to evolution of computers. It has been characterized by increasing processor speed, decreasing component size, increasing memory size, and increasing I/O capacity and speed.</p> <p>The great increase in processor speed is the shrinking size of Microprocessor components. The true gains in speed in recent years have come from the organization of the processor, including heavy use of pipelining and parallel execution techniques.</p> <p>A critical issue in computer system design is balancing the performance of the various elements, so that gains in performance in one area are not handicapped by a lag in other areas.</p> <p>In particular, processor speed has increased more rapidly than memory access time. A variety of techniques are used to compensate for this mismatch, including caches, wider data paths from memory to processor, and more intelligent memory chips.</p>			
COURSE OBJECTIVES			
<p>To understand how computers are constructed out of a set of functional units and how the functional units operate, interact and communicate.</p> <p>To make the students to understand the concept of interfacing memory and various I/O devices to a computer system using a suitable bus system.</p>			
COURSE OUTCOMES (CO)			
Course Outcomes	Aligned Programme Outcomes (PO)		
After successful completion of the course the students are able to			
CO1: apply the basic knowledge of digital concept to the functional components of a Computer System.	PO1 –H PO2 – M		

	PO3, PO5 - L
CO2: analyze the addressing mode concepts and design the instruction set Architecture.	PO1 -H PO2,PO3,PO5 - M PO4, PO9 - L
CO3: identify the functions of various processing units within the CPU of a Computer System.	PO1,PO2,PO3 -H PO4,PO7 - M PO5, PO9 - L
CO4: analyze the function of the memory management unit and create suitable memory interface to the CPU.	PO2,PO3 -H PO1,PO4,PO9,PO12 - M PO5, PO7 - L
CO5: recognize the need for recent Bus standards and I/O devices.	PO2,PO3,PO9 -H PO1,PO4,PO5,PO12 - M PO7 - L
	H-High M- Medium L=Low

COURSE TEACHING AND LEARNING ACTIVITIES

S.No.	Week	Topic	Mode of Delivery
1	Second week of July	Function and structure of a computer, Functional components of a Computer	PPT
2	Third week of July	Interconnection of components	PPT
3	Fourth week of July	Performance of a computer	Chalk & Talk PPT
4	First week of August	Machine instructions, Memory locations & Addresses, Operands, Addressing modes	Chalk & Talk PPT
5	Second week of August	Instruction formats, Instruction sets, CISC and RISC architectures	Chalk & Talk PPT
6	Third week of August	Super scalar Architectures, Fixed point and floating point operations	Chalk & Talk PPT
7	Fourth week of August	ALU, Control unit, Multiple bus organization, Hardwired control,	Chalk & Talk PPT
8	First week of September	Micro programmed control, Pipelining, Data hazards, Instruction hazards	Chalk & Talk PPT
9	Second week of September	Data path and control considerations, Performance considerations	Chalk & Talk PPT
10	Third week of September	Semiconductor RAM memories, ROM, Speed - Size and cost,	Chalk & Talk PPT
11	Fourth week of September	Cache memory, Improving cache performance, Memory management unit	Chalk & Talk PPT
12	First week of October	Concept of virtual memory, Address translation, Secondary storage devices.	Chalk & Talk PPT
13	Second week of	Accessing I/O devices, Input/output programming	Chalk & Talk

	October		PPT
14	Third week of October	Interrupts, Exception Handling, DMA, Buses	PPT
15	Fourth week of October	I/O interfaces - Serial port, Parallel port, PCI bus, SCSI bus, USB bus, Firewall and Infiniband, I/O peripherals.	PPT

COURSE ASSESSMENT METHODS

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1.	Assessment -1 Assignment 1	Second week of August		5 marks (1 st unit)
2.	Assessment -2 Written test (Descriptive type)	Third week of August	1 Hour	20 marks (2 units) Unit 1 & 2
3.	Assessment -3 Written test (Descriptive type)	Fourth week of September	1 Hour	20 marks (2 units) Unit 3 & 4
4.	Assessment -4 Assignment 2	Third week of October		5 marks (5 th unit)
5.	Assessment -5 Written Exam (Descriptive type)	First week of November	3 Hours	50 marks (All 5 units)
6.	Assessment -6 Compensation Assessment (CPA) Written Exam (Descriptive type)	Fourth week of October (If applicable)	1 Hour	20 marks (First 4 units)

ESSENTIAL READINGS : Textbooks, reference books Website addresses, journals, etc

Text Books:

1. C. Hamacher, Z. Vranesic and S. Zaky, "Computer Organization", McGraw- Hill, 2012. (6 th edition)
2. W. Stallings, "Computer Organization and Architecture - Designing for Performance", Prentice Hall of India, 2012. (9th Edition)

Reference Books

1. D. A. Patterson and J. L. Hennessy, "Computer Organization and Design –The Hardware/Software Interface", Morgan Kaufmann, 2013. (5 th edition)
2. J .P. Hayes, "Computer Architecture and Organization", McGraw-Hill, (3 rd edition)
3. Behrooz Parhami, "Computer Architecture-From Microprocessors to Supercomputers", Oxford University Press, 2014.

COURSE EXIT SURVEY (mention the ways in which the feedback about the course is assessed and indicate the attainment also)

Course feedback is assessed through

1. Class committee meeting
2. Frequently ask the questions in the class and analyzes the responses
3. Course exit survey form

Course Attainment is calculated through

1. Direct tools (Exams and Assignments)

COURSE POLICY (including plagiarism, academic honesty, attendance, etc.)

Correspondence: All the students are advised to come to class regularly. All the correspondence (schedule of classes/ schedule of assessment/ course material/ any other information regarding this course) will be intimated in class/ over phone/ in faculty room / through their webmail.

Attendance:

1. All the students should maintain minimum 75 % of physical attendance in these contact hours to attend the end semester exam.
2. Any student who fails to maintain 75% attendance only on reasonable medical grounds needs to appear for the compensation assessment (CPA) classes. On successful completion of CPA classes along with assessment criteria will be eligible for attending the end semester examination.
3. Students not having 75% minimum attendance at the end of the semester and also fail to attend CPA classes will have to appear for Redo.

Assessment:

1. Attending all the assessments is MANDATORY for every student.
2. If any of the student is not able to attend Assessment -2 and Assessment- 3 examinations due to genuine reason (any academic related work through department or medical grounds only), may appear for compensation assessment (CPA) which will carry 20% weight. CPA cannot be considered as an improvement exam.
3. Submission of assignment is MANDATORY for every student within the stipulated time failing which 10% weightage will not be considered for final grade assessment.
4. There will not be any improvement test for the students who score low marks in continuous assessment test.
5. Finally, every student is expected to score minimum 35% of the mark in the total assessment (1, 2, 3, 4, 5 and 6) to pass the course or class average /2. Otherwise the student will be declared fail and 'F' grade will be awarded. Further the student can take up only one Reassessment.
6. If any of the student is failed in Reassessment can follow the FORMATIVE ASSESSMENT.

ADDITIONAL COURSE INFORMATION

Any queries send a mail to thilagavathy@nitt.edu

FOR SENATE'S CONSIDERATION

Course Faculty _____

CC-Chairperson _____

HOD _____

Thilagavathy

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