NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

| COURSE PLAN | | | |
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| Course Title | COMPUTER ARCHITECTURE AND ORGANIZATION | | |
| Course Code | ECPE24 | No. of Credits | 03 |
| Department | Electronics and Communication Engineering (B) | Faculty | Ms.C.G.Akalya |
| Pre-requisites Course Code | None | | |
| Course Coordinator | Dr.B.Malarkodi | | |
| Other Course Teacher(s)/Tutor(s) E-mail | | Telephone No. | cgakal@nitt.edu 9688267445 |
| Course Type | Programme Elective | | |

COURSE OVERVIEW

Students get exposure to the fundamentals of computer architecture . Students will be taught about the internal flow of processing units ,fetching of instructions and memory organization.Students will understand I/O Devices,bus,interface concepts. Further they will be exposed to pipelining,firewall,flowchart & applications.

COURSE OBJECTIVES

1. To understand how computers are constructed out of a set of functional units and how the functional units operate, interact, and communicate.
2. 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.

COURSE OUTCOMES (CO)

Students are able to

- CO1:Apply the basic knowledge of digital concept to the functional components of a Computer System.
- CO2:Analyze the addressing mode concepts and design the instruction set Architecture.
- CO3:Identify the functions of various processing units within the CPU of a Computer System.
- CO4:Analyze the function of the memory management unit and create suitable memory interface to the CPU.
- CO5: Recognize the need for recent Bus standards and I/O devices.

COURSE TEACHING AND LEARNING ACTIVITIES

| S.No. | Week | Topic | Mode of Delivery |
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| 1. | 1st Week of January (02/01/17 to 06/01/17) 3 Contact Hours | Function and structure of a computer, Functional components of a Computer, Interconnection of components | |

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| 2. | 2nd Week of January (09/01/17 to 13/01/17) 3 Contact Hours | Performance of a computer, Machine instructions, Memory locations & Addresses | Lecture C&T/ PPT or any suitable mode |
| 3. | 3rd Week of January (16/01/17 to 20/01/17) 3 Contact Hours | Operands, Addressing modes, Instruction formats, Instruction sets, | |
| 4. | 4th Week of January (23/01/17 to 27/01/17) 3 Contact Hours | Instruction set architectures - CISC and RISC architectures, Super scalar Architectures. | |
| | ASSESSMENT I - 20 Marks | | Descriptive type (Written) |
| 5. | 1st Week of February (30/01/17 to 03/02/17) 3 Contact Hours | Fundamental concepts, Control unit, Multiple bus organization, Hardwired control, Micro programmed control, Pipelining, | Lecture C&T/ PPT or any suitable mode |
| 6. | 2nd Week of February (06/02/17 to 10/02/17) 3 Contact Hours | Data hazards, Instruction hazards, Influence on instruction sets, Data path and control considerations, Performance considerations. | |
| | ASSESSMENT II - 10 Marks (QUIZ) | | Objective type (written) |
| 7. | 3rd Week of February (13/02/17 to 17/02/17) 3 Contact Hours | Basic concepts, Semiconductor RAM memories, ROM, Speed - Size and cost, Memory Interfacing circuits | Lecture C&T/ PPT or any suitable mode |
| 8. | 4th Week of February (20/02/17 to 24/02/17) 3 Contact Hours | Cache memory, Improving cache performance, Memory management unit, Shared/Distributed Memory, Cache coherency in multiprocessor, Segmentation, Paging, | |
| 9. | 1st Week of March (27/02/17 to 03/03/17) 3 Contact Hours | Concept of virtual memory, Address translation, Secondary storage devices, fixed point and floating point operations, ALU | |
| | ASSESSMENT III - 20 Marks | | Descriptive type (Written) |
| 10. | 2nd Week of March (06/03/17 to 10/03/17) 3 Contact Hours | Accessing I/O devices, Input/output programming, Interrupts, Exception Handling, DMA, Buses, | |

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| 11. | 3rd Week of March (13/03/17 to 17/03/17) 3 Contact Hours | I/O interfaces- Serial port, Parallel port, PCI bus, SCSI bus, USB bus, | Lecture C&T/ PPT or any suitable mode |
| 12. | 4th Week of March (20/03/17 to 24/03/17) 3 Contact Hours | Firewall and Infini band, I/Operipherals | |
| 13. | 5th Week of March (27/03/17 to 31/03/17) 3 Contact Hours | Problem solving | |
| 14. | 1st Week of April (03/04/17 to 07/04/17) 3 Contact Hours | Problem solving | |
| 15. | 2nd Week of April | CPA - 20 Marks | Descriptive type (Written) |
| 16. | 4th Week of April | END ASSESSMENT – 50 Marks | Descriptive type (Written) |

COURSE ASSESSMENT METHODS

| S.No. | Mode of Assessment | Week/Date | Duration | % Weightage |
|---|---|---|---|---|
| 1. | Assessment I | 4th Week of January | 60 Minutes | 20 |
| 2. | Assessment II (QUIZ) | 3rd Week of February | 60 Minutes | 10 |
| 3. | Assessment III | 2nd Week of March | 60 Minutes | 20 |
| 4. | CPA | 2nd Week of April | 60 Minutes | 20 |
| 5. | End Assessment | 4th Week of April | 180 Minutes | 50 |

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

Text Books:

1. C.Hamacher, Z. Vranesic and S. Zaky, "Computer Organization", McGraw-Hill, 2002.

2. W. Stallings, "Computer Organization and Architecture - Designing for Performance", Prentice Hall of India, 2002.

3. B,Parhami, "Computer Architecture, From Microprocessors to Supercomputers," Oxford University Press, Reprint 2014.

References Books:

1. D. A. Patterson and J. L. Hennessy, "Computer Organization and Design,

2. Morgan Kaufmann,"The Hardware/Software Interface",1998.

3. J .P. Hayes, "Computer Architecture and Organization", McGraw-Hill,1998.

4. M.Morris Mano, "Computer System Architecture", Pearson Publication,2013.

5. Recent literature in Computer Architecture and Organization.

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

Feedback from the students during class committee meetings

Anonymous feedback through questionnaire

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

CORRESPONDENCE

1. All the students are advised to check their NITT WEBMAIL/group mail/suggested by the course faculty, class representative regularly. All the correspondence (schedule of classes/ schedule of assessment/ course material/ any other information regarding this course) will be done through them only.
2. Queries (if required) to the course teacher shall only be emailed to the email id specified by the teacher.

ATTENDANCE

3. Attendance will be taken by the faculty in all the contact hours. Every student should maintain minimum of 75 % physical attendance in these contact hours along with assessment criteria to attend the end semester examination.
4. Any student, who fails to maintain 75% attendance need to appear for the compensation assessment (CPA).
5. Those students who have attendance lag for any genuine reason and also missed any of the continuous assessments (CAs) can appear for CPA to get eligibility for writing the end semester examination .
6. Students not having 75% minimum attendance at the end of the semester and also fail in CPA (scoring less than 60%) will have to REDO the course.

ASSESSMENT

7. Attending all the assessments are MANDATORY for every student.
8. If any student is not able to attend any of the continuous assessments due to genuine reason, student is permitted to attend the compensation assessment (CPA) with 15 % weightage.
9. At any case, CPA will not be considered as an improvement test.
10. Students are expected to score minimum 30% of the maximum mark of the class in the CAs to attend the end semester examination in addition to the attendance requirement. Otherwise the student is permitted to attend CPA and is expected to score more than 60% marks to get eligibility to appear for end semester examination. However, the score in CPA WILL NOT be considered for computing marks for CA. Student who fails to score 60% in CPA will take up additional assignments to get eligibility for writing End assessment examination.
11. Finally, every student is expected to score minimum 40% of the maximum mark of the class in the total assessment (1, 2, 3, 4 and 5) to pass the course. Otherwise the student would be declared fail and 'F' grade will be awarded. Further he can take up only FORMATIVE ASSESSMENT.

ACADEMIC HONESTY & PLAGIARISM

1. All the students are expected to be genuine during the course work. Taking of information by means of copying simulations, assignments, looking or attempting to look at another student's paper or bringing and using study material in any form for copying during any assessments is considered dishonest.
2. Tendering of information such as giving one's program, simulation work, assignments to another student to use or copy is also considered dishonest.
3. Preventing or hampering other students from pursuing their academic activities is also considered as academic dishonesty.
4. Any evidence of such academic dishonesty will result in the loss of marks on that assessment. Additionally, the names of those students so penalized will be reported to the class committee chairperson and HoD of the concerned department.
5. Students who honestly producing ORIGINAL and OUTSTANDING WORK will be REWARDED.

**ADDITIONAL COURSE INFORMATION**

**eg.:** The Course Coordinator is available for consultation at times that are displayed on the coordinator's office notice board. Queries may also be emailed to the Course Coordinator directly at ----------

**FOR SENATE'S CONSIDERATION**

**Course Faculty** _____ 3/1/17 **CC-Chairperson** _____ 3/1/2017. **HOD** _____ 3/1/2017