DEPARTMENT OF COMPUTER APPLICATIONS

NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

COURSE PLAN – PART I			
Name of the programme and specialization	**Master of Computer Applications**		
Course Title	Computer Organization and Architecture		
Course Code	CA715	**No. of Credits**	**3**
Course Code of Pre-requisite subject(s)	**NIL**		
Session	**July 2019**	**Section (if, applicable)**	**A and B**
Name of Faculty	Dr. P.J.A. Alphonse	**Department**	Computer Applications
Email	alphonse@nitt.edu	**Telephone No.**	0431-2503742
Name of PAC Chairman	Dr.S.Nickolas		
E-mail	nickolas@nitt.edu	**Telephone No.**	**0431-2503739**
Course Type	**Core course**		

Syllabus (approved in BoS)

Number Systems - Binary Arithmetic - Boolean algebra - Map Simplifications - Gates - Combinational Circuits - Sequential Circuits.

Memory: Internal - External - Memory Organization - Associative - Cache – Virtual memory.

CPU: Arithmetic And Logic Unit - Instruction Sets - RISC - CISC - Instruction pipeline - Addressing modes and formats - Register organization - Control Unit Operation - Processor organization.

External Devices: I/O modules - Programmed I/O - Interrupt Driven I/O - Direct Memory Access - I/O Channels - Asynchronous Data Transfer.

Processors: Parallel – Multi-core – Mobile – Embedded – GPU and TPU.

REFERENCES:

1. William Stallings, "Computer Organization and Architecture", 7th Edition, 2006, PHI.
2. M. Morris Mano and Michael D. Ciletti, "Digital Design", 4th Edition, 2007, Pearson Education.
3. Hennessy J. and Patterson D., "Computer Architecture – A Quantitative Approach", 1990,

Morgan Kaufmann.

COURSE OBJECTIVE(S)

1. To understand the data representation in a digital computer and explain how operations are performed by computer circuits
2. To study and analyze the internal components of a computer and evaluate the performance of CPU, memory and I/O operations
3. Study and analyze the modern processor architecture

COURSE OUTCOMES (CO)

Course Outcomes	Aligned Programme Outcomes (PO)
1. Define binary number system and arithmetic operations. Design a Boolean circuit for a given problem	**PO I, II, III, IV, V**
2.Analyze the different types of memory and their organization	**PO I, II, III, IV, V**
3.Describe the functional units of the CPU and its organization	**PO I, II, III, IV, V**
4.Discover the working and organization of I/O Devices	**PO I, II, III, IV, V**
5. Evaluate the different modern processor architecture.	**PO I, II, III, IV, V**

COURSE PLAN – PART II

COURSE OVERVIEW

The Computer Organization and Architecture course deals with the study of data representation in computers and its internal circuits. It also explains the internal components of computer like CPU, Memory and I/O Devices and their characteristics. Various modern processor architecture will be evaluated.

COURSE TEACHING AND LEARNING ACTIVITIES

S.No.	Week/Contact Hours	Topic	Mode of Delivery
1	Week 1	Introduction and Binary Number System	Classroom activity
		Binary Arithmetic	

		Boolean Algebra	
2	Week 2	Map Simplifications	Classroom activity
		Gates	
3	Week 3	Combinational Circuits	Classroom activity
		Sequential Circuits	
		Memory: Internal	
4	Week 4	External	Classroom activity
		Memory Organization	
		Associative Cache Virtual memory	
5	Week 5	CPU: Arithmetic And Logic Unit	Classroom activity
		Instruction Sets	
		RISC - CISC	
6	Week 6	Instruction pipeline	Classroom activity
		Addressing modes and formats	
		Register organization	
7	Week 7	Control Unit Operation	Classroom activity
		Processor organization	
		External Devices: I/O modules	
8	Week 8	Programmed I/O	Classroom activity
		Interrupt Driven I/O	
		Direct Memory Access	
9	Week 9	I/O Channels	Classroom activity
		Asynchronous Data Transfer	
		Processors: Parallel	
10	Week 10	Multi-core	Classroom activity
		Mobile	
		Embedded and Cloud computing/ IOT	

COURSE ASSESSMENT METHODS

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Cycle Test 1	6th Week	60 Minutes	20
2	Cycle Test 2	10th Week	60 Minutes	20
3	Assignment	9th week	-	10
4	Final Assessment	-	180 Minutes	50

COURSE EXIT SURVEY

- The students through the class representative may give their feedback at any time to the course coordinator which will be duly addressed.
- The students may give their feedback during class committee meetings.

COURSE POLICY

MODE OF CORRESPONDENCE

By Email: alphonse@nitt.edu

COMPENSATION ASSESSMENT POLICY

Compensation assessment will be conducted for absentees in cycle test I or cycle test II only after the submission of medical or On-Duty certificates signed by competent authority.

ATTENDANCE POLICY

- 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.
- 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.
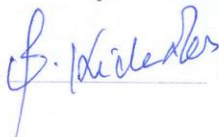
ADDITIONAL INFORMATION

a) The passing minimum shall be as per the regulations. Attendance policy and the policy on academic dishonesty & plagiarism by students are uniform for all the courses.

FOR APPROVAL

Course Faculty _____ CC-Chairperson _____ HOD S.R.Balasundaram