NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

COURSE PLAN			
Course Title	**DIGITAL SYSTEM DESIGN**		
Course Code	**EC661**	**No. of Credits**	**03**
Department	**Electronics and Communication Engineering**	**Faculty**	**Mrs.B.Rosalinekavitha**
Pre-requisites Course Code	**None**		
Course Coordinator	**Dr.P.Palanisamy**		
Other Course Teacher(s)/Tutor(s) E-mail		**Telephone No.**	rosaline@nitt.edu **9894201260**
Course Type	**Elective**		

COURSE OVERVIEW

Students get exposure to the fundamentals of digital system design. Students will understand synthesis of datapath, worst case timing analysis and FSM.Students will be taught about analysis of combinational network, sequencing static circuits,datapath and array subsystems at circuit level. Further they will be exposed to reconfigurable computing architectures such as fine grain, coarse grain and configuration architectures.

COURSE OBJECTIVES

1. **To get an idea about designing complex, high speed digital systems and how to implement such design.**
2. **To make the students to understand the concept of timing analysis of combinational network, sequencing circuits, datapath and array subsystems at circuit level.**

COURSE OUTCOMES (CO)

Students are able to

- **CO1: Understand the concept of front end digital system design i.e. Algorithm to architectures**
- **CO2: Analyze the performance of combinational logic circuits**
- **CO3: Design sequencing static circuits and sequencing dynamic circuits.**
- **CO4: Design data path and memory array subsystems.**
- **CO5: Understand the concept of reconfigurable computing architectures.**

COURSE TEACHING AND LEARNING ACTIVITIES

S.No.	Week	Topic	Mode of Delivery
1.	1st Week of august (1/8/2017 to 4/8/2017)	Mapping algorithms into Architectures, Data path synthesis	BB
2.	2nd Week of august (7/8/2017 to 11/8/2017)	control structures, critical path and worst case timing analysis	
3.	3rd Week of august (14/8/2017 to 18/8/2017)	FSM and hazards	BB
4.	4th Week of august (21/8/2017 to 25/8/2017)	Combinational network delay	
5.	1st Week of September (28/8/2017 to 1/9/2017)	Power and energy optimization in combinational logic circuit.	BB
6.	2nd Week of September (4/9/2017 to 8/9/2017)	Sequential machine design styles	
	ASSESSMENT I - 20 Marks		**Descriptive type (Written)**
7.	3rd Week of September (11/9/2017 to 15/9/2017)	Rules for clocking, performance analysis	
8.	4th Week of September (18/9/2017 to 22/9/2017)	Sequencing static circuits, circuit design of latches and flip-flops	**Lecture C&T/ PPT or any suitable mode**
9.	5th Week of September (25/9/2017 to 29/9/2017)	Static sequencing element methodology, sequencing dynamic circuits	
	ASSESSMENT II - 20 Marks		**Descriptive type (Written)**

10.	2nd Week of October (09/10/17 to 13/10/17)	Synchronizers, Addition / Subtraction, Comparators, counters	
11.	3rd Week of October (16/10/17 to 20/10/17)	Coding, multiplication and division. SRAM, DRAM, ROM	Lecture C&T/ PPT or any suitable mode
12.	4th Week of October (23/10/17 to 27/10/17)	serial access memory, context addressable memory, Fine grain and Coarse grain architectures	
13.	1st Week of November (1/11/17 to 3/11/17)	Single context, Multi context, partially reconfigurable architectures	
14.	2nd Week of November (06/11/17 to 10/11/17)	Pipeline reconfigurable, Block Configurable, Parallel processing	
15.	3rd Week of November	**CPA - 20 Marks**	**Descriptive type (Written)**
16.	4th Week of November	**END ASSESSMENT – 50 Marks**	**Descriptive type (Written)**

COURSE ASSESSMENT METHODS

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1.	Assessment I	3rd Week of September	60 Minutes	20
2.	Assessment II	1st Week of October	60 Minutes	20
3.	Assignment	3rd Week of November	-	10
4.	3rd Week of November	CPA	60 Minutes	20
5.	End Assessment	4th Week of November	180 Minutes	50
ESSENTIAL READINGS : Textbooks, reference books Website addresses, journals, etc				

Text Books:

 1. N.H.E.Weste, D. Harris, "CMOS VLSI Design (3/e)", Pearson, 2005.

2. W.Wolf, "FPGA- based System Design", Pearson, 2004.

3. S.Hauck, A.DeHon, "Reconfigurable computing: the theory and practice of FPGA-based computation", Elsevier, 2008.

References Books:

1. F.P. Prosser, D. E. Winkel, "Art of Digital Design", 1987.

2. R.F.Tinde, "Engineering Digital Design", (2/e), Academic Press, 2000.

3. C. Bobda, "Introduction to reconfigurable computing", Springer, 2007.

4. M.Gokhale, P.S.Graham, "Reconfigurable computing: accelerating computation with

Field-programmable gate arrays", Springer, 2005.

5. C.Roth," Fundamentals of Digital Logic Design", Jaico Publishers, V ed., 2009.

6. Recent literature in Digital System Design.

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

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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). Student who scores more than 60 % marks in the CPA along with assessment criteria will be eligible for attending the end semester examination.
5. Those students who have attendance lag and also missed any of the continuous assessments (CAs) can appear for CPA to get eligibility for writing the end semester examination as quoted in Pt. 2. Their scores in the CPA WILL NOT be taken into

account for computing marks for CA.

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 of [(class max marks)/3 (or) (class average)/2] whichever is less in the total assessment (1, 2, and 3) 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

e.g.: 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 palan@nitt.edu.

FOR SENATE'S CONSIDERATION

Course Faculty _G. Pm.lbe_ CC-Chairperson _____ HOD _____