NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

Department of Mathematics

COURSE OUTLINE TEMPLATE			
Course Title	**INTRODUCTION TO PROBABILITY THEORY**		
Course Code	**MAIR37**	**No. of Credits**	**3**
Department	**COMPUTER SCIENCE ENGG**	**Faculty**	**Mrs.S.Sangeetha**
Class	**B Tech, II Year**	**Section**	**B**
Pre-requisites Course Code	**MAIR11,MAIR21**		
Course Coordinator(s) (if, applicable)	**NIL**		
E-mail	**sangeetha@nitt.edu** **sangee.siva11@gmail.com**	**Telephone No.**	**8754435993**
Course Type	**General Institute requirements**		

COURSE OVERVIEW

- **To have general awareness and understanding of probability theory and its applications, distributions & queuing theory.**

Learning Objectives: Objective of the course is to introduce

1. **Probability theory , permuations and combinations**
2. **Conditional probability, Baye`s rule.**
3. **Distribution functions**
4. **Random process, finite Markov chain, queues with finite and infinite waiting space.**

COURSE OUTCOMES (CO)

On completing this course students will be able to

1. Solve almost all type of problem in probability.
2. Understand the axiomatic formulation of modern probability theory and think of random variables as an intrinsic need for the analysis of random phenomena.
3. Understanding the concepts of distributions
4. Approximate the real problems using stochastic process and deduce results.
5. Deduce useful results and interpret them based on the analysis of queuing theory

COURSE TEACHING AND LEARNING ACTIVITIES

WEEK	TOPIC	MODE OF DELIVERY
1st ,2nd Week	Definitions of probability, notion of sample space, Events , Basics of Combinatorial analysis, Posing probability problems mathematically – Examples	CHALK & TALK

3rd, 4th & 5th Week	Conditional probability , Baye`s rule, Random variables, Probability mass function, Density function, Distribution function, Bernoulli trails, Binomial Distribution, Poison Approximation, Poisson distribution, Normal distribution, Moment generating function	
6th week	Assessment Test – I	
6th ,7th & 8th week	Joint probability density function, Marginal and conditional densities, function of random variable, covariance and conditional expectation, correlation coefficient	CHALK & TALK
9th, 10th & 11th Week	Chebyshev inequality, Law of large numbers, central limit theorem, random process, Markov dependence, Markov chains, definition, examples, ergodicity	
12th week	Assessment Test – II	
13th, 14th Week	Finite Markov chain, Various states, Limiting probability, introduction to Markov process, M/M/1 queues with finite and infinite waiting space	CHALK & TALK
14th Week	Reassessment Test	
After 14th Week	Semester Examination	

COURSE ASSESSMENT METHODS

S.No	Mode of Assessment	Week	Duration	% weightage
1.	Assessment - I	6th Week	1 hour	20%
2.	Assessment – II	12th Week	1 hour	20%
3.	Reassessment Test	14th Week		
3.	Semester Exam	After14th Week	3 hours	50%
4.	Assignments		Will be announced at the time of distribution of assignment sheets	10%

Reference Books:

1. W.FELLER, An introduction to probability theory and its applications, 3rd Edn, Vol.1 John-Wiley & Sons, 2008.
2. Papoulis.A.Probability, Random variables and stochastic process, McGraw Hill, 2006
3. Kishore S.Trivedi, Probability and Statistics with Reliability, Queuing and Computer Science Applications, Wiley- India edition, 2008
4. A.O.ALLEN, Introduction to Probability, Statistics and queuing theory with Computer Applications, Academic Press, 2006 reprint.

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

1. *Feedback form issued to students to express their comments about the course before cycle test I & after completing the syllabus. Students are requested to give genuine feedback about the course.*
2. *Student knowledge about the topic covered in this course will be judged through marks obtained in examination.*

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

Examination:

i) Studens who have missed the first or second cycle test or both can register the Re-Test examination which shall be conducted soon after the completion of the second cycle test and before the regular semester examination.

ii) The Re-Test examination shall be conducted for 20 marks comprising the syllabus of both first and second cycle tests.

iii) Students shoud submit assignments before last date of submission. In case students fails to submit their assignments within last date of submission, he/she will get zero mark for that particular assignment.

2.Attendance:

i) The minimum attendance for appearing for the semester examination is 75%

ii) Those students, whose attendance fails below 75% but above 50% in a subject, shall attend mandatory classes before the semester examinations to qualify to write semester exam.

iii) The students who are having attendance less than 50% has to redo the course in next semester.

3. **The institute follows relative grading with flexibility given to teachers to decide the mark ranges for grades. All assessment of a course will be done on the basis of marks.**
4. **The passing minimum should be 35%**
5. **The performance analysis committee, which shall meet within seven days after the completion of all examinations, shall analyze the relative cumulative performance of students in all examinations (continuous and end-semester) of a course and finalize the letter grade ranges for the course.**
6. **The letter grades and the corresponding grade points are as follows**

Letter	S	A	B	C	D	E,R	F,I	V	FF	X
Grade(GP)	10	9	8	7	6	5	0	-	2	-

a) **Students scoring less than the passing minimum marks in the assessments defined in the course plan shall be deemed to have not successfully completed the course and be given an `F`` grade.**

b) **Students awarded F grade may REDO the course or opt for formative assessment.**

c) **`V` indicates lact of required attendance. Students awarded `V` grade must compulsorily redo the course.**

d) **`I` grade indicated incompletion of formative assessment.**

e) **A student who gets an `I` grade must necessarily convert it to a `R ` grade by completing the formative assessment.**

f) **An `FF` grade is awarded for not completing the formative assessment in the prescribed maximum period of study due to gross negligence. An `FF` grade will have a grade point of 2 and it will remain on the grade card permanently. This will be used in the CGPA calculations.**

g) **A student who earns a minimum of 5 grade points (a `E` grade or a `R` grade) in a course is declared to have successfully completed the course.**

h) **If the students fails to appear semester examination due to genuine/medical reason, can register for special end semester examination after approval from course teacher & Head of department of mathematics/Dean(academic). The special end semester examination will be conducted within ten days from reopening of institute for next semester. Students should register their names with course teacher to appear for special end semester examination within three days from reopening of institute for next semester. Grade issued as per the guidelines followed for his/her batch students.**

i) **There will be one reassessment (for 90 marks) for the students who have secured `F` in this course and will be conducted within ten days from reopening of institute for next semester. Students should register their names with course teacher to appear for reassessment within three days from reopening of institute for next semester. If the students satisfy the criteria fixed by the faulty to promote E grade will be given and others given`F`grade.**

ADDITIONAL COURSE INFORMATION:

Faculty is available for discussion after the class hours at the Department on the first floor of Lyceum. Room No. 204. Faculty can also be contacted over phone: 8754435993

FOR SENATE`S CONSIDERATION

(Course faculty) CC – Chairperson HOD (MATHS) 11.7.2017