



# NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

## DEPARTMENT OF MECHANICAL ENGINEERING

COURSE PLAN – PART I			
Name of the programme and specialization	B.Tech / Mechanical Engineering		
Course Title	OPERATIONS RESEARCH		
Course Code	MEPE40	No. of Credits	3
Course Code of Pre-requisite subject(s)	NIL		
Session	July 2021	Section (if, applicable)	A & B
Name of Faculty	Dr. Sreejith Mohan	Department	Mechanical Engineering
Official Email	sreejith@nitt.edu	Telephone No.	6238050110
Name of Course Coordinator(s) (if, applicable)			
Official E-mail		Telephone No.	
Course Type (please tick appropriately)	<input type="checkbox"/> Core course	<input checked="" type="checkbox"/> Elective course	
<b>Syllabus (approved in BoS)</b>			
Linear programming – Graphical Method – Simplex algorithm – Duality formulation – Sensitivity analysis.			
Transportation Assignment Models – Traveling Salesman problem – Networks models – Shortest route – Minimal spanning tree – Maximum flow models – CPM and PERT networks – Critical path scheduling – Sequencing models.			
Inventory models – Economic order quantity models – Quantity discount models – Stochastic inventory models – Multi product models			
Queueing models– Single server and multi-server models – Poisson input – Exponential service – Constant rate service – Infinite population			
Decision models – Game theory – Graphical and Algebraic solution – Linear Programming solution – Replacement models – Models based on service life – Economic life – Single / Multi variable search technique – Dynamic Programming			
<b>COURSE OBJECTIVES</b>			
1. To provide knowledge and training in using optimization techniques for engineering problems.			
2. To understand different optimization model adopted in engineering industry			



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<b>MAPPING OF COs with POs</b>	
<b>Course Outcomes</b>	<b>Programme Outcomes (PO)</b> (Enter Numbers only)
At the end of the course student will be able to use the optimization techniques for engineering and Business problems	1, 2, 3, 4, 5, 6, 7

<b>COURSE PLAN – PART II</b>			
<b>COURSE OVERVIEW</b>			
<b>COURSE TEACHING AND LEARNING ACTIVITIES</b> ( Add more rows)			
S.No.	Week/Contact Hours	Topic	Mode of Delivery
1	1st week	Linear programming – Graphical Method - Simplex algorithm	Online (MS Teams)
2	2 <sup>nd</sup> week	Duality formulation - Sensitivity analysis - Transportation Assignment Models	Online (MS Teams)
3	3 <sup>rd</sup> week	Traveling Salesman problem	Online (MS Teams)
4	4 <sup>th</sup> week	Networks models – Shortest route	Online (MS Teams)
5	5 <sup>th</sup> week	Minimal spanning tree – Maximum flow models- CPM and PERT networks	Online (MS Teams)
6	6 <sup>th</sup> week	Critical path scheduling – Sequencing models - Inventory models – Economic order quantity models	Online (MS Teams)
7	7 <sup>th</sup> week	Quantity discount models – Stochastic inventory models - Multi product models	Online (MS Teams)
8	8 <sup>th</sup> week	Queueing models– Single server models	Online (MS Teams)



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9	9 <sup>th</sup> week	multi-server models— Poisson input – Exponential service – Constant rate service – Infinite population	Online (MS Teams)
10	10 <sup>th</sup> week	Decision models – Game theory – Graphical and Algebraic solution –	Online (MS Teams)
11	11 <sup>th</sup> week	Replacement models - Dynamic Programming	Online (MS Teams)

### **COURSE ASSESSMENT METHODS** (shall range from 4 to 6)

S.No.	Mode of Assessment	Week	Duration	% Weightage
1	CT1	6 <sup>th</sup>	1 hour	25
2	Assignment 1	-		20
3	CT2	10 <sup>th</sup>	1 hour	25
CPA	Compensation Assessment*	As per the academic schedule		25
4	Final Assessment *			30

**\*mandatory; refer to guidelines on page 5**

### **COURSE EXIT SURVEY** (mention the ways in which the feedback about the course shall be assessed)

1. Students can meet the faculty at any stage in the course duration in case he/she finds difficulty in understanding the concept.
2. Feedback form issued to students to express their comments about the course after completing the syllabus. Students are requested to give genuine feedback about the course.
3. Student knowledge about the topic covered in this course will be judged based on marks obtained in the written examination.

### **COURSE POLICY** (including compensation assessment to be specified)

- Students must attend the classes regularly.
- Students should submit the assignment as per the instruction given at the class. Late submission is not permitted.
- The institute follows relative grading with flexibility given to teachers to decide the mark ranges for grades.
- All assessment of the course will be done on the basis of marks.

### **MODE OF CORRESPONDENCE**

Email: [sreejith@nitt.edu](mailto:sreejith@nitt.edu), Mobile: 6238050110



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### **COMPENSATION ASSESSMENT POLICY**

One compensation assessment in the form of viva voce shall be conducted for the students failed in appearing for assessment I, II or both I & II.

### **ATTENDANCE POLICY** (A uniform attendance policy as specified below shall be followed)

- 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.
- Zero mark to be awarded for the offenders. For copying from another student, both students get the same penalty of zero mark.
- 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, IF ANY**

### **FOR APPROVAL**

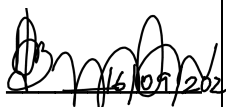
Course Faculty

  
15/09/2021

CC- Chairperson



HOD

  
16/09/2021



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### Guidelines

- a) The number of assessments for any theory course shall range from 4 to 6.
- b) Every theory course shall have a final assessment on the entire syllabus with at least 30% weightage.
- c) One compensation assessment for absentees in assessments (other than final assessment) is mandatory. Only genuine cases of absence shall be considered.
- d) The passing minimum shall be as per the regulations.

B.Tech. Admitted in				P.G.
2018	2017	2016	2015	
35% or (Class average/2) whichever is greater.		(Peak/3) or (Class Average/2) whichever is lower		40%

- e) Attendance policy and the policy on academic dishonesty & plagiarism by students are uniform for all the courses.
- f) Absolute grading policy shall be incorporated if the number of students per course is less than 10.

Necessary care shall be taken to ensure that the course plan is reasonable