



NATIONAL INSTITUTE OF TECHNOLOGY,
TIRUCHIRAPPALLI

DEPARTMENT OF MATHEMATICS

COURSE PLAN – PART I			
Name of the programme and specialization	M.Sc., MATHEMATICS		
Course Title	TOPOLOGY		
Course Code	MA 7 06	No. of Credits	3
Course Code of Pre-requisite subject(s)			
Session	January 2021	Section (if, applicable)	
Name of Faculty	Dr. Lakshmana gomathi nayagam	Department	Mathematics
Official Email	velulakshmanan@nitt.edu	Telephone No.	9486001132
Name of Course Coordinator(s) (if, applicable)			
Official E-mail		Telephone No.	
Course Type (please tick appropriately)	<input checked="" type="checkbox"/> Core course	<input type="checkbox"/> Elective course	
Syllabus (approved in BoS)			
Course Content: Finite, countable, uncountable sets. Functions and relations. Partially ordered sets, well ordered sets. Axiom of choice, Well-ordering theorem, The maximum principle, Zorn's lemma. Topological spaces, open sets, closed sets. Closure and interior of a set. Limit points of a set. Basis for a topology, sub basis. Subspace topology, order topology, product topology $X \times Y$. T_1 , T_2 and Hausdorff spaces, and Metric topology. Continuous functions, Homeomorphisms, constructing continuous functions, The pasting lemma. Product topology, box topology, quotient topology. Connected spaces, components and locally connectedness, path connectedness. Compact spaces, limit point compactness, sequentially compactness, local compactness, finite intersection property. Compactifications. Countability axioms, separation axioms, regular and normal spaces. The Urysohn's lemma, The Urysohn's metrization theorem, The Tietze extension theorem, The Tychonoff theorem.			
COURSE OBJECTIVES			
This course 1. introduces the notion of open and closed sets and deals with continuity, connectedness, compactness and various countability and separation axioms.			
MAPPING OF COs with POs			
Course Outcomes	Programme Outcomes (PO) (Enter Numbers only)		
Completion of the course, student will be able to 1. understand various notions of topological spaces and derived concepts.	a , b , c ,d		



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2. prove results about homeomorphism, product topology, connectedness and compactness.	a , b , c ,d
3. prove theorems about Hausdorff spaces, Regular and Normal spaces.	a , b , c ,d
4. construct new continuous functions and prove compactness in arbitrary product spaces.	a , b , c ,d

COURSE PLAN – PART II

COURSE OVERVIEW

This course deals with the basics of set theory, open sets, closed sets, continuous functions, separation axioms, compactness and connectedness. The course ended up with proving famous theorems The Tietze extension theorem and The Tychonoff theorem.

COURSE TEACHING AND LEARNING ACTIVITIES

S.No.	Week/Contact Hours	Topic	Mode of Delivery
1	1 st week	Functions and relations.	Online tools
2	2 nd week	Finite, countable and uncountable sets.	Online tools
3	3 rd week	Partially ordered sets, well ordered sets.	Online tools
4	4 th week	Axiom of choice, Well-ordering theorem, The maximum principle, Zorn's lemma.	Online tools
5	5 th week	Topological spaces, open sets, closed sets, Basis for a topology, sub basis.	Online tools
6	6 th week	Subspace topology, order topology Closure and interior of a set, limit points of a set. Assessment-I (Seminar/Assignment-1) Assessment-II (Cycle test-1)	Online tools
7	7 th week	Product topology $X \times Y$. T1, T2 and Hausdorff spaces, and Metric topology.	Online tools



8	8 th week	Continuous functions, Homeomorphisms. Constructing continuous functions, the pasting lemma.	Online tools
9	9 th week	Product topology, box topology, quotient topology.	Online tools
10	10 th week	Connected spaces, components and locally connectedness, path connectedness.	Online tools
11	11 th week	Compact spaces, limit point compactness, sequentially compactness, local compactness.	Online tools
12	12 th week	Finite intersection property, Compactifications. Assessment-III (Assignment-2) Assessment-IV (Cycle test-2)	Online tools
13	13 th week	Countability axioms, separation axioms, regular and normal spaces.	Online tools
14	14 th week	The Urysohn's lemma, the Urysohn's metrization theorem.	Online tools
15	15 th week	The Tietze extension theorem, The Tychonoff theorem.	Online tools
16	16 th week	Final assessment	Online tools

COURSE ASSESSMENT METHODS (shall range from 4 to 6)

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Assessment-I (Seminar/Assignment-1)	6 th week		10%
2	Assessment-II (Cycle test-1)	6 th week	90 minutes	25%



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3	Assessment-III (Assignment-2)	12 th week		10%
4	Assessment-IV (Cycle test-2)	12 th week	90 minutes	25%
CPA	Compensation Assessment	15 th week	90 minutes	
5	Assessment-V (Final Assessment)	16 th week	2 hours	30%

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 before Assessment I & 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 through marks obtained in examination.

COURSE POLICY (including compensation assessment to be specified)

1. Examination:

- a) Students who have missed the Assessment I or Assessment II or both due to any medical emergencies / On Duty can only register for the Compensation Assessment, which shall be conducted soon after the completion of the Assessment II and before the regular semester examination (Assessment-V).
- b) The Compensation Assessment shall be conducted for 25 marks comprising the syllabus of both Assessment I and Assessment II.
- c) Students are strictly not allowed to enroll for Compensation Assessment to improve their marks.
- d) Students should submit assignments before last date of submission. In case students fail to submit their assignments, he/she will get zero mark for that particular assignment.

2. The Institute follows relative grading with flexibility given to teachers to decide the mark ranges for grades. All assessments of a course will be done based on marks.

3. Supplementary Examination:

- a) Students who get "F" or "X" grade and satisfactory attendance in the courses are eligible for Supplementary Examination.
- b) The Supplementary Examination will normally be held during a specific week of the subsequent semesters. The supplementary examination shall be scheduled by the Office of the Dean Academic
- c) The course teacher who offered the course or a faculty member nominated by the HOD/Mathematics will conduct the Supplementary Examination.
- d) The weightage for the supplementary examination shall be 100%. Absolute grading system with a passing minimum of 40% shall be followed.
- e) In case a student fails in the Supplementary Examination, he/she has to reappear till the student passes the course.



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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 V. Lakshmi 25/01/2021 CC- Chairperson P. Sankaranarayanan 25/01/2021 HOD V. Lakshmi 25/01/2021
(P. SAIKRISHNAN)



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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.
- g) Necessary care shall be taken to ensure that the course plan is reasonable and is objective.