NATIONAL INSTITUTE OF TECHNOLOGY TIRUCHIRAPPALLI

DEPARTMENT OF MATHEMATICS

COURSE PLAN – PART I			
Name of the programme and specialization	**M.Sc. / Mathematics, I Year**		
Course Title	Algebra		
Course Code	MA702	**No. of Credits**	03
Course Code of Pre-requisite subject(s)	NIL		
Session	January, 2021	**Section (if, applicable)**	
Name of Faculty	Dr. Abhijit Das	**Department**	Mathematics
Email	abhijit@nitt.edu	**Telephone No.**	(+91) 8093329659
Name of Course Coordinator(s) (if, applicable)	--		
E-mail		**Telephone No.**	
Course Type	**Core Course**		

Syllabus (approved in BoS)

Review of basic Group Theory – Group actions – Conjugacy classes – The class equation – Sylow's Theorem - Direct Product –Fundamental Theorem of Finite Abelian Groups.

Review of basic Ring Theory – Ideals and Factor rings – Prime and Maximal ideals– Euclidean domains– principal ideal domains and unique factorization domains–Polynomial rings – Factorization of Polynomials.

Extension fields – Splitting fields – Algebraic and Transcendental extensions – Simple extensions – Separable extensions - Finite fields.

Galois Theory – Fundamental Theorem of Galois Theory – Solvability of Polynomials by Radicals – Solvable groups – Insolvability of a quantic.

ESSENTIAL READINGS : (Textbooks, reference books etc.)

- D. S. Dummit and R. M. Foote: Abstract Algebra, 3rdEdition, John-Wiley, 2011.
- M. Artin: Algebra, 2nd edition, Pearson, 2011.
- I.N. Herstein: Topics in Algebra, 2nd edition, John-Wiley, 2008.
- J.A. Gallian: Contemporary Abstract Algebra, 4thedition, Narosa, 1999.
- N. Jacobson: Basic Algebra I and II, 2nd Edition, Dover Publication Inc., 2009.

COURSE OBJECTIVE

To

- introduce the concepts of conjugacy classes and Sylow's theorems
- explain the Fundamental Theorem of Finite Abelian Groups
- learn the various types of integral domains
- expose the students to extensions field and its properties
- learn the Galois Theory and solvability.

COURSE OUTCOMES (CO)

Course Outcomes	**Aligned Programme Outcomes (PO)**
On completion of the course, students will be able to • analyze the concepts of conjugacy classes and Sylow's theorem • understand the properties of various type of integral domains • gain the knowledge on the extension fields • understand the concepts of Galois Theory and solvability.	a-e

COURSE PLAN – PART II

COURSE OVERVIEW

This course will

1. introduce and discuss the importance of group and ring theory.
2. explain the concepts of field extension.
3. introduce and discuss various properties associated with Galois theory.

COURSE TEACHING AND LEARNING ACTIVITIES

Sr.No.	**Week/Contact Hours**	**Topic**	**Mode of Delivery**
1.	1^{st} – 5^{th} week	Review of basic Group Theory – Group actions – Conjugacy classes – The class equation – Sylow's Theorem - Direct Product –Fundamental Theorem of Finite Abelian Groups.	Online Lecture
2.	5^{th}, 6^{th} & 8^{th} week	Review of basic Ring Theory – Ideals and Factor rings – Prime and Maximal ideals– Euclidean domains– principal ideal domains and unique factorization domains– Polynomial rings – Factorization of Polynomials.	Online Lecture

3.	7th week	**Assignment -1**	
4.	7th week	**Assessment -1**	**Written Test**
5.	9th & 10th week	Extension fields – Splitting fields – Algebraic and Transcendental extensions – Simple extensions – Separable extensions - Finite fields.	Online Lecture
6.	11th -12th week	Galois Theory – Fundamental Theorem of Galois Theory – Solvability of Polynomials by Radicals – Solvable groups – Insolvability of a quantic.	Online Lecture
7.	13th Week	**Assignment -2**	
8.	13th Week	**Assessment - 2**	**Written Test**
9.	14th Week	Revision and doubt clearing session.	Online Lecture
10.	14th Week	Compensation Assessment	**Written Test**
11.	After 14th Week	**Final Assessment (Assessment -3)**	**Written Test**

COURSE ASSESSMENT METHODS (shall range from 4 to 6)

S.No.	**Mode of Assessment**	**Week / Date**	**Duration**	**% Weightage**
1.	Assessment 1 (Written Test)	7th week	1.5 hour	25%
2.	Assessment 2 (Written Test)	13th week	1.5 hour	25%
3.	Assignments/viva	Date for viva will be announced during the course		20%
CPA	Compensation Assessment * (Written Test)	14th week		

4.	Final Assessment# (Assessment -3, Written Test)	After 14th week	2 hours	30%

* One compensation assessment for absentees in the assessments (other than the final assessment) will be conducted for 25 marks comprising the syllabus of both Assessment-1 and Assessment-2. Only genuine cases of absence shall be considered.

Minimum 30% must be secured in the Final Assessment for passing the course.

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

1. Students can meet the faculty (with prior appointment) at any stage in the course duration in case he/she finds difficulty in understanding the topic.
2. Feedback form issued to students to express their comments about the course before Assessment -1, and 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 (preferred mode of correspondence with students, compensation assessment policy to be specified)

The institute follows relative grading with flexibility given to teachers to decide the marks range for grades. All assessments of a course will be done on the basis of marks.

MODE OF CORRESPONDENCE (email / phone etc)

Students can meet the course faculty by fixing appointment through E-mail or phone call between 9:30 am to 5:30 pm in the working days.

COMPENSATION ASSESSMENT POLICY

Only the students who are absent in any of the Assessment Tests (or both) **with genuine reasons (medical emergencies /On Duty)** will be allowed to write the compensation test. Students are strictly not allowed to enroll for compensation assessment to improve their marks.

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
FOR APPROVAL

Dr. Abhijit Das	**Dr. P. Saikrishnan**	**Dr.V. Lakshmana Gomathi Nayagam**
(Course Faculty)	**CC-Chairperson**	**HOD**

27/1/2021

Guidelines:

a) **The number of assessments for a course shall range from 4 to 6.**
b) **Every 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. Details of compensation assessment to be specified by faculty.**
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.**