

COURSE TEMPLATE

1.	Department /Centre proposing the course	Mathematics
2.	Course Title (<i>< 45 characters</i>)	ALGEBRA
3.	L-T-P structure	3 - 0 - 0
4.	Credits	3
5.	Course number	MAL 105
6.	Status (<i>category for program</i>)	DC for Maths and PLC for Others

7.	Pre-requisites (course no./title)	NIL
----	---	-----

8.	Status vis-à-vis other courses (<i>give course number/title</i>)	
8.1	Overlap with any UG/PG course of the Dept./Centre	NIL
8.2	Overlap with any UG/PG course of other Dept./Centre	NIL
8.3	Supercedes any existing course	MAL 256

9.	Not allowed for (indicate program names)	NIL
----	--	-----

10.	Frequency of offering	☐ Every sem ☐ 1 st sem ☐ 2 nd sem ☒ Either sem
-----	------------------------------	---

11.	Faculty who will teach the course R Barman, S Kundu, R.K. Sharma, R. Sarma, A. Tripathi	
12.	Will the course require any visiting faculty?	No

13.	Course objective (<i>about 50 words</i>): Introduction to certain abstract notions of modern algebra.	
-----	---	--

14.	Course contents (<i>about 100 words</i>) (<i>Include laboratory/design activities</i>): Preliminaries: Equivalence relations and partitions; Groups: Subgroups, Cyclic groups, Abelian groups, permutation groups; Lagrange's theorem, normal subgroups, quotient groups, isomorphism theorems. Direct product of groups, structure theorem of finitely generated abelian groups, Sylow's theorems and applications. Rings: Definition and examples, units and zero divisors. Ideals and quotients, principal ideals, prime ideals, maximal ideals, integral domain, PID, Euclidean domain, UFD. Modules over a commutative ring with unity: Free module, quotient module, exact sequences. Fields: Finite fields, field extensions, splitting fields.	
-----	--	--

15. Lecture Outline *(with topics and number of lectures)*

Module no.	Topic	No. of hours
1	Equivalence relation and partition.	2
2	Groups and subgroups, Cyclic groups, Abelian groups, permutation groups.	4
3	Lagrange's theorem, normal subgroup, quotient groups, isomorphism theorems.	6
4	Direct product of groups, structure theorem of finitely generated abelian groups.	4
5	Sylow's theorems and applications	5
6	Definition and examples of ring, units and zero divisors, ideals and quotients, principal ideal, prime ideal, maximal ideal, integral domain.	6
7	PID, Euclidean domain, UFD.	4
8	Free module, quotient module, exact sequences	4
9	Finite fields, field extensions, splitting field.	7
10		
11		
12		
COURSE TOTAL (14 times 'L')		42

16. Brief description of tutorial activities

--

17. Brief description of laboratory activities

Module no.	Experiment description	No. of hours
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
COURSE TOTAL (14 times 'P')		

18. Suggested texts and reference materials

STYLE: Author name and initials, Title, Edition, Publisher, Year.

1. I N Herstein, Topics in Algebra, 2nd Edition, Wiley India Pvt Ltd, 2006.
2. J A Gallian, Contemporary Abstract Algebra, 4th Edition, Narosa Book Distributors Private Ltd, 2004.
3. M Artin, Algebra, 2nd Edition, Pearson, 2010

19. Resources required for the course *(itemized & student access requirements, if any)*

19.1	Software	Nil
19.2	Hardware	Nil
19.3	Teaching aides (videos, etc.)	Nil
19.4	Laboratory	Nil
19.5	Equipment	Nil
19.6	Classroom infrastructure	Microphone, Blackboard and Projector.
19.7	Site visits	Nil

20. Design content of the course *(Percent of student time with examples, if possible)*

20.1	Design-type problems	Nil
20.2	Open-ended problems	Nil
20.3	Project-type activity	Nil
20.4	Open-ended laboratory work	Nil
20.5	Others (please specify)	Nil

Date: 3-1-2014

(Signature of the Head of the Department)