

### Course specifications

Programme(s) on which the course is given	B.Sc. of
Mathematics, Pure Mathematics	
and	Computer
Science, Mathematics and Statistic	
Major or minor element of programmes	Major
Department offering the programme	Mathematics
Department offering the course	Mathematics
Academic year / Level	first level
Date of specification approval	September 2012

#### A- Basic Information

Title: Algebra	Code:M 113		
Credit Hours: 2.5 hrs	Lecture: 2 hrs		
Tutorial: 1 hr.	Practical: 0 hr.	Total: 2.5	
hrs			
Teaching Staff: Dr. Laila Nashed			

#### B- Professional Information

##### 1 – Overall aims of course

Algebra is a subject taught in grade and high school which includes the :

- One of the most important tools in modern mathematics in the theory of sets.
- Solution of polynomials and basic properties of functions and graphs.

##### 2 – Intended learning outcomes of course (ILOs)

###### a- Knowledge and understanding:

a1-Demonstrate a knowledge and understanding of fundamental physical laws and principles in particular in the areas of algebra.

a2- Have the knowledge about the mathematical terminologies used in this course.

a3- Develop the knowledge about the methods of solutions of polynomial.

a4- Appreciate the ideas of mathematical modeling in a number of application areas.

**b- Intellectual skills**

students should be able to:

**b1- Set a program of exercises according to the type of the course.**

**b2- Classify the topics of the course into groups according to their applications.**

**b3- Use algebra to describe the physical world and show an understanding of mathematical modeling of physical phenomena, use appropriate mathematical tools in physics problems**

**c- Professional and practical skills**

**c1- set a program of exercise based on the tools he learned in the course.**

**c2- Weight the out comes of the course through its use in practical application in different scientific fields.**

**c3- Communicate the results of mathematical ideas, in formal presentations, both oral and written.**

**d- General and transferable skills**

**d1- Set a program of exercise based on the tools be learned in the course.**

**d2- Weight the outcomes of the course through its use in practical application in different scientific fields.**

**d3- Organize their own learning and use appropriate learning resources, work both independently and a part of a team.**

**3- Contents**

<b>Topics</b>	<b>No. of hours</b>	<b>Lecture</b>	<b>Tutorial/Practical</b>
<b>Introductions of Mathematical logic: Statement, connectives and existential quantifiers. Introduction to set theory: Specification of a set. Some</b>	<b>9</b>	<b>3</b>	<b>3</b>

<p><b>principle sets, Intervals power set of a set union and intersection of sets. Symmetric difference of two sets. Cartesian product of sets.</b></p>			
<p><b>Relation on sets, Binary relation, composite relation order relation, Equivalence relation, Equivalence classes and partitions. Quotient set</b></p>	<b>9</b>	<b>3</b>	<b>3</b>
<p><b>Number Theory: Natural Numbers: Peanos postulates. Addition, multiplication, mathematical induction. Integers. Division algorithm. Euclidean theorem</b></p>	<b>9</b>	<b>3</b>	<b>3</b>
<p><b>Argument and Geometrical representation of Equation Theory: Roots of an equation – Relation between roots and coefficients. Some standard reductions of cubic Cardans solution of cubic. Descartes solution of biquadratic. Descartes resolvent.</b></p>	<b>14</b>	<b>5</b>	<b>4</b>

**4– Teaching and learning methods**

**4.1-Lectures .**

**4.2-Working on hand in assignments.**

**4.3-Attaining Practical classes .**

**5- Student assessment methods**

**5.1 Mid term written exam  
understanding competencies**

**to assess**

**5.2 Oral Exam** to assess attendance and interest.

**5.3 Semester hand in assignments** to assess understanding professionalism.

**5.4 Final term written Exam** to assess comprehension.

**Assessment schedule**

<b>Assessment 1</b>	<b>Mid term</b>	<b>Week 7</b>
<b>Assessment 2</b>	<b>semester activities</b>	<b>Week 5 and 8</b>
<b>Assessment 3</b>	<b>Final term oral exam</b>	<b>Week 13</b>
<b>Assessment 4</b>	<b>final term written exam</b>	<b>Week 14</b>

**Weighting of assessments**

<b>Mid-Term Examination</b>	<b>20%</b>
<b>Final-term Examination</b>	<b>60%</b>
<b>Oral Examination.</b>	<b>00%</b>
<b>Practical Examination</b>	<b>00%</b>
<b>Semester Work</b>	<b>20 %</b>
<b>Other types of assessment</b>	<b>00%</b>
<b>Total</b>	<b>100%</b>
<b>Total</b>	<b>100%</b>

**Any formative only assessments**

**6- List of references**

**6.1- Course notes collected and prepared notes that cover the main topic in the course content.**

**6.2- Essential books (text books)**

**1) R. S. Aggarwal and N. A. S. College:**

**A text Book on set theory and Number System.**

**Meerut S. Chand and Co. LDT Ram Nagar , New Delhi.**

**2) Shanti Narayan: Elements of Elementary Algebraic Structures S. Chand and Co. Delhi**

**3) Ravinder Kumar and Sirikrishan Wasan: A text Book of Algebra , Pitambar Publishing Company , New Delhi.**

**6.3- Recommended books**

**None**

**6.4- Periodicals, Web sites, ... etc**

**None**

**7- Facilities required for teaching and learning**

**None**

**Course coordinator: Prof. Mohamed A. Ramadan**

**Head of Department:**

**Date: / /**