**توصيف مقرر دراسي**

**جامعة : المنصورة**

**كـليـة : العلـــــوم**

**قســم : الرياضيات**

| **١- بيانات المقرر** | | |
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| **الرمز الكودي:Math 111** | **اسم المقرر : Algebra & Geometry** | **المستوى : الاول** |
| **التخصص :الرياضيات** | **عدد الوحدات الدراسية : ٣ ساعات معتمدة نظري: ٢ تمارين:٢ عملي : ٠** | |

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| **٢- هدف المقرر:** | **The aims of this course are to:**<br>1- provide students with various methods, theories in algebra and geometry.<br>2- Know and understand the fundamental conceptes in algebra and geometry. |
| **٣- المستهدف من تدريس المقرر** | |
| **أ- المعلومات و المفاهيم :** | **a- Knowledge and Understanding**<br>**On completing this course, students will be able to**<br>a1-acquire an understanding of basic concepts of algebra and geometry.<br>a2 - recognize notions of mathematical induction, complex numbers, partial fractions and binomial theorems.<br>a3-be aware of the geometric properties of straight lines and conic sections |
| **ب- المهارات الذهنية :** | **b- Intellectual Skills**<br>**On completing this course, students will be able to**:<br>b1 –interpret mathematical problems using basic concepts of algebra and geometry.<br>b2- simplify the algebraic expressions.<br>b3- construct elementary proofs of mathematical statements utilizing inductive arguments and arguments by contradiction;<br>b4 – illustrate geometrical problems expressed in terms of polar coordinates |
| **ج- المهارات المهنية الخاصة بالمقرر :** | **c-Professional and Practical Skills**<br>**On completing this course, students will be able to**<br>c1-analyze basic concepts and results in algebra and geometry and apprehend |

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| their applications.<br><br>c2- solve problems in algebra and geometry<br><br>c3- use information technology to solve some related problems in algebra and geometry. | |
| **d-General and Transferable Skills**<br><br>**On completing this course, students will be able to**<br><br>d1. Think independently, set tasks and solve problems on a scientific basis.<br><br>d2. use , efficiently, information and communication technology<br><br>d3. Work effectively in groups. | **د- المهارات العامة :** |
| **<u>Algebra</u>**<br><br>• Mathematics induction.<br>• Partial fractions<br>• Binomial theorem.<br>• simple method for sum of series<br>• Solution of cubic equations<br>• Solution of $4^{th}$ degree equations<br>• Sets, subsets, set operations and inductively definition of sets<br>• Equivalent relations, equivalence classes, partitions and partial order .<br>• Maps, composition of maps, kinds of maps and inverse functions,<br>• permutation on finite sets.<br>• equivalent sets and cardinality of sets<br>• binary operations, examples of groups and fields.<br>**<u>Geometry</u>**<br><br>• Cartesian and polar coordinates in plane<br>• Equations of straight line- The common equation of pair of straight lines<br>• Introduction to conic section- parabola - ellipse- hyperbola<br>• The general equation of the second degree in two variables and polar equations of some plane curves | **٤- محتوى المقرر :** |
| 1- lectures<br><br>2- tutorials<br><br>**3-** use information technology | **٥- أساليب التعليم و التعلم** |
| The same as normal students, only skeletal disabilities are allowed in the Faculty of Science. | **٦- أساليب التعليم و التعلم للطلاب ذوى القدرات المحدودة** |
| | **٧- تقويم الطلاب :** |
| 1- Final exam to assess a1,a2,a3, c1, c2, c3 | **أ- الأساليب** |

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| **المستخدمة** | 2- Oral exam to assess b1 ,b2,b3, b4, d1, d2, d3<br>3- Mid-Term Exam to assess a1, a2, b1, b2, d1-d3 |
| **ب- التوقيت** | 1- Final exam week 16<br>2- Oral exam week 16<br>3- Mid-Term Exam week 7 |
| **ج- توزيع الدرجات** | - Mid-Term Examination 10%<br>- Final-Term Examination 80%<br>- Oral Examination 10%<br>- Practical Examination 0<br>- Other types of assessment 0<br>Total 100% |
| **٨- قائمة الكتب الدراسية و المراجع :** | |
| **أ- المذكرات** | - Lecture Notes: " Analytic geometry in plane" |
| **ب- الكتب ملزمة** | A.C. Burdette, "An introduction to analytical geometry and calculus", Academic press , London 1969 |
| **ج- كتب مقترحة** | - E. Swokowski, M. Olinick & D.Pence, "Calculus", 6th Edition, PWS Publishing Co-Schaum's series , Analytic Geometry, 1994.<br>-P.J. Eccles, An Introduction to Mathematical Reasoning: Numbers, Sets and Functions, Cambridge University Press, 1997. |
| **د- دوريـــــــات علميـــــة أو نشرات** | http://www.math.niu.edu/~beachy/aaol<br>http://mathworld.wolfram.com/Abacus.html |

## (أ) مصفوفة المعارف والمهارات المستهدفة من المقرر الدراسى

| المحتويات للمقرر | اسبوع الدراسة | المعارف الرئيسية | مهارات ذهنية | مهارات مهنية | مهارات عامة |
|---|---|---|---|---|---|
| **Algebra** | | | | | |
| Mathematics induction. | 1 | a1, a2 | b1, b2 | c1, c2, c3 | d1,d3 |
| Partial fractions | 2 | a1, a2 | b1, b2 | c1, c2, c3 | d1,d3 |
| Binomial theorem. | 2 | a1, a2 | b1, b2 | c1, c2, c3 | d1,d3 |
| simple method for sum of series | 3 | a1, a2 | b1, b2 | c1, c2, c3 | d1,d3 |
| Solution of cubic equations and solution of 4th degree equations | 3 | a1, a2 | b1, b3 | c1, c2, c3 | d1,d3 |
| Sets, subsets, set operations and inductively definition of sets | 4 | a1, a2 | b1, b2 | c1, c2, c3 | d1, d2, d3 |
| Equivalent relations, equivalence classes, partitions and partial order . | 5 | a1, a2 | b1, b2 | c1, c2, c3 | d1,d3 |
| Maps, composition of maps, kinds of maps and inverse functions, permutation on finite sets. | 6 | a1, a2 | b1, b2 | c1, c2, c3 | d1,d3 |
| equivalent sets and cardinality of sets | 7 | a1, a2 | b1, b2 | c1, c2, c3 | d1 |
| binary operations, examples of groups and fields. | 7 | a1, a2 | b1, b2 | c1, c2, c3 | d1, d2, d3 |
| **Geometry** | | | | | |
| Cartesian and polar coordinates in plane | 8 | a1, a3 | b1, b4 | c1, c2, c3 | d1,d3 |
| Equations of straight line- The common equation of pair of straight lines | 9 | a1, a3 | b1, b4 | c1, c2, c3 | d1,d3 |
| Introduction to conic section- parabola - ellipse- hyperbola | 10-13 | a1, a3 | b1, b4 | c1, c2, c3 | d1,d3 |
| The general equation of the second degree in two variables polar coordinates and polar equations of some plane curves | 14 | a1, a3 | b1, b4 | c1, c2, c3 | d1, d2, d3 |

**أستاذ المادة : د. عواطف شاهين**

**رئيس مجلس القسم العلمي :ا.د. مجدى إلياس فارس**