Course Code	Course Title	Credits	Prerequisite
Math 601	**Abstract Algebra 1**	**3**	**Math 323 or equivalent**

1 - Course Description: This course provides an introduction to abstract algebra, so it is designed to cover the basic concepts of the abstract algebra and entrench the algebraic ideas in the students mind, which lead to use mathematical logic concepts to prove basic theories, which easily lead to study deeply an advanced courses.

2 - Objectives of the course

After completing this course, the student will be

1. Familiar with the basic concepts of abstract algebra, able to deal with abstract concepts as well as use mathematical logic to prove basic theories.
2. Familiar with the algebraic construction and its conditions.
3. Understand that the abstract algebra is the main theory of mathematics that study the important algebraic construction such as groups, rings, fields and other.

3 - Syllabus:

Groups, subgroups, lattices of subgroups, cosets and normal subgroups, quotient group, homorphism, isomorphism and related theorems. Rings, subrings, ideals, ring homomorphism, quotient rings, polynomial rings and irreducibility criteria. Fields, field extensions, algebraic extensions, algebraic closure and fundamental theorem of algebra.

4 - Basic references

1. I. N. Herstein, Topics in Algebra, John Wiley and Sons, 2006.
2. J.B. Farleigh, A first course in abstract algebra, Wesley Publishing Co. London, 7th edition, 2003.

5 - Assistance references

1.D. Dummit and R. Foote, Abstract Algebra, John Wiley & Sons, 3rd edition, 2004.
2. Thomas W. Hungerford, Algebra, Springer, 2003.

Course Code	Course Title	Credits	Prerequisite
Math 602	**Real Analysis1**	**3**	**Math 315 or equivalent**

1 - Course Description:Real analysis is a branch of mathematics that deals with real numbers and the idea of sets, functions,and limits. Real analysis has become an important component in areas of natural science, social science, engineering,business and computer science. This course develops and examines the basic materials in real analysis in a systemic and rigorous manner in the context of real-valued functions of real variable.It covers the fundamentals of real analysis: the real number system, sequences, continuity, differentiation,the Riemann-Stieltjes integral and sequence and series of functions .

2 - Objectives of the course

On completion of this course; successful students are able to:

1. Describe the fundamental properties of the real numbers.
2. Demonstrate an understanding of limits and how they are used in sequencesseries and differentiation.
3. Apply the properties of sequences to solve related problems.
4. Analyze continuity of a function and distinguish between continuity and uniform continuity.
5. Construct rigorous mathematical proofs of basic results in real analysis.
6. Distinguish between point-wise convergence and uniform convergence.
7. Apply the properties of the Riemann-Stieltjes integral to identify integrablefunctions.

3 – Syllabus

Real number, Countable and uncountable sets, Sequences and Series, Limits and Continuity of real functions, Derivative of real functions,Riemann-Stieltjes integral, Functions of more than one variables

4 - Basic references

1- Walter Rudin ,''Principle of Mathematical Analysis''; Third Edition, McGraw –Hill.Inc.ISBN 1976

5 - Assistance references

1- R.G. Bartle and D.G. Sherbert,'' Introduction to Real Analysis'', , 3rd Edition.JohnWiley and Sons, 2000
2- Richard R. Goldberg,''Methods of Real Analysis '',3rd Edition,John Wiley and Sons .Inc. 1976.

Course Code	Course Title	Credits	Prerequisite
Math 603	**Complex Analysis**	**3**	**Math 314 or equivalent**

1 - Course Description: Complex analysis is a branch of mathematical analysis that deals with functions of complex variables. It has a wide range of applications in various areas such as engineering, physics, differential equations and in number theory . The main focus of these course is on the study of analytic functions and their basic properties. Topics covered are: complex number system, limits, differentiation, analytic functions, Mobius transformations, complex line integral, Cauchy theorem, Cauchy integral formula and Taylor's theorem.

2 - **Objectives of the course**

On completion of this course; successful students are able to:

1. Prove basic results relating to analytic functions.
2. Apply the Cauchy Integral formula to evaluate certain class of complex line integrals.
3. Express analytic functions in power series.
4. Find a harmonic conjugate of a given harmonic function in an appropriate domain.
5. Apply the Cauchy.Riemann equations to problems related to differentiability of function of complex variable.
6. Apply the properties of Mobius transformation in mappingsand related problems in analytic functions

3 - Syllabus:

The complex number system, metric space and the topology of C, analytic function, power series, analytic function as mapping Mobius transformation, complex integration, power series representation of analytic function, zeros of an analytic function, Cauchy's theorem, integral formula, the homotopic version of Cauchy's theorem, simply connectivity, counting zeros, the open mapping theorem and Goursat's theorem.

4 - Basic references

1- Jerrold E. Marsden and Michael J. Hoffman ,''Basic Complex Analysis'', third edition, W.H Freeman, New York, 1999.

5 - Assistance references

1- I, John B. Conway ,''Function of one Complex Variable'', Second edition, Springer, New York, 1978.
2- 1 Richard A. Silverman ,''Introductory Complex Analysis'',ISBN, New York, Dover Publications, 1967.
3- B. Choudhary,Wiley Eastern ,''Elements of Complex Analysis'' Ltd., New Delhi, 1993.

Course Code	Course Title	Credits	Prerequisite
Math 604	**Numerical analysis**	**3**	**Math 419 or equivalent**

Course Description: Numerical analysis is the area of mathematics and computer science that creates, analyzes, and implements algorithms for solving numerically the problems of continuous mathematics. Which involves systems, approximation functions, solutions for ordinary and partial differential equations, Numerical differentiation and integration, methods to solve initial and boundary values problems, stability and convergence of the solutions that occur in different areas of sciences.

2 - Objectives of the course

Students after studying the course are expected to:

1. Know linear and non-linear systems and different numerical methods.
2. Distinguish between different numerical methods.
3. Formulate appropriate method to approximate numerical solutions.
4. Apply the appropriate method to solve mathematical problems and prove the stability and convergence of these methods.
5. **Explore** some new numerical methods that have different areas of research

3 - Syllabus:

Linear and nonlinear systems; Iterative methods ; Interpolation ; Approximation of solutions ; Error estimate ; Data fitting ; Numerical differentiation and integration ; Numerical solutions of boundary value problems ; Stability and convergence of solutions ; Finite difference method ; Finite element method.

4 - Basic references:

1- Richard Burden and J.DougiasFaires,"Numerical Anlysis",Brooks/Cole, Cengage Learning, 2011

5 - Assistance references :

1- AlfioQuarteroni ,Riccardo Sacco and Fausto Saleri, 'Numerical Mathematics ' Springer, 2007

Course Code	Course Title	Credits	Prerequisite
Math 605	**Theory of differential equations**	**3**	**Math 352 or equivalent**

1 - Course Description: The basic theory of differential equations as covered in all applied mathematics. Indeed, modern applied mathematics essentially began when Newton developed the calculus in order to solve the differential equations that followed from his laws of motion.
However, this theory is not only of interest to the applied mathematician: indeed, it is an integral part of any rigorous mathematical training, and is developed here in a systematic way.

2 - Objectives of the course:

After completing this course, the student should be able to

1- Know the most technique of studying differential equations.
2- Solve various systems of differential equations.
3- Prove the existence and uniqueness of solutions.
4- Interpret the qualitative behavior of solutions for system of differential equations.

3 - Syllabus

Systems of differential equations, Existence and Uniqueness proofs, Singular points, Asymptotic behavior of solutions, Existence, Stability and Uniqueness for Initial-Value Problems, Sturm-Liouville Theory, Eigenvalues and Eigenfunctions, **Lyapunov's Second Method** , Rayleigh- Rietz methods, Perturbation theory.

4 - Basic references:

1- R. Kent Nagle, E. B. Saff, A. D. Snider, Fundamentals of Differential Equations and Boundary Value Problems, Pearson Addison-Wesley 2008.

5 - Assistance reference:

1- Wolfgang Walter, Ordinary Differential Equations, (Translated by Russel Thompson), Springer 1998.

Course Code	Course Title	Credits	Prerequisite
Math 606	**Mathematical Statistics I**	**3**	**Math 352 & 453 or equivalent**

1 - Course Description. This is the first graduate course in mathematical statistics and it aims to use the probability techniques to build a statistical theory. It gives a rigorous mathematical foundation for Estimation theory and Testing hypothesis. It provides a firm basis for work on Statistical theory and its applications.

2 - Objectives of the course

1- Understand the language of probability theory to build Statistical Theory.
2- Know random variables and order variables and its distribution.
3- Learn concepts of Conditioning, Transforms and Convergence.
4- Learn Sampling and methods of Sampling .
5- Able to collect data and analyze problems in a critical manner and make a decision
6- Able to take advanced work on Statistical Theory and applications.

3 - Syllabus:

a - Theoretical side

Axioms and foundations of probability. Conditional probability and Bayes' theorem. Independence. Random variables and distribution functions and moments. Characteristic functions, Laplace transforms and moment generating functions. Function of random variables. Random vectors and their distributions. Convergence of sequences of random variables. Laws of large numbers and the central limit theorem. Random samples, Sampling and sampling distributions, Sample moments and their distributions. Order statistics and their distributions.

b - The practical side (if applicable)

Using computer Statistical Software such as Minitab or any other computer tools.

4 - Basic references

1- R. V. Hogg and Allen T. Craig ,''Introduction to Mathematical Statistics'', Mcmillan, 1978, 1995
2- **R.V. Hogg, J. Mckean and A.T.Craig** ,''Introduction to Mathematical Statistics'',Prentice Hall, 2005

5 - Assistance references

1- V.K. Rohatgi,''Introduction to Probability Theory and Mathematical Statistics''**Wiley**, 1976

Course Code	Course Title	Credits	Prerequisite
Math 607	**Probability Theory I**	**3**	**Math 352**

1 - Course Description

This is the first graduate course in probability theory and measure-theoretic probability. It provides a solid background and understanding of the basic results and methods in measure and probability theory before entering into a more advance measure-theoretic probability course. It develops the measure probability basis that is required in modern probability theories. The materialin this course is fundamental not only in probabilistic analysis, but also in a various applied areas such as stochastic processes, queuing theory, mathematical financeand reliability.

2 - Objectives of the course:

1- Learning the basic theorems in measure and probability Theory
2- Knowing mathematical transforms and operators in Probability Theory
3- Understanding the convergence theory and limits theory
4- Understanding the concept of conditional probability and martingale theory.
5- Developing theoretical problems-solving skills.Having probabilistic intuitions and insight in thinking about problems
6- Preparing and having a firm basis for advanced work on probability and measure.

3 - Syllabus:

a - Theoretical side

Foundations of probability theory.Fundamentals of measure theory. Measure-theoretic approach to definitions ofprobability space, construction of probability spaces, measure constructions, random variables and distribution functions. Measurable functions and random variables. Independence. Tails events. Zero-one laws and Borel-Cantelli lemmas. Integration and Expectation. Modes of convergence and relations between the various modes. Laws of large numbers and sum of Independent variables. Convergence in distribution. Characteristic functions. The central limit theorem. Weak convergence of probability measures. Conditional expectations and martingales.

b - The practical side (if applicable)

4 - Basic references:

1- Patrick Billingsely .''Probability and Measure, , 2nd edition'', Wiley1986, 1995.
2- Richard Durrett ,''Probability: Theory and Example', Wadsworth and Brools/cole, ca, 1995

5 - Assistance references :

1- Allan Gut ,''Probability: A graduate Course'', Springer,**2007**
2- Sidney Resnick ,''Probability Path'', Birkhauser, 1999.

Course Code	Course Title	Credits	Prerequisite
Math 620	**Abstract Algebra 2**	**3**	**Math 601**

1 - Course Description: This course continues the study of algebra begun in the Abstract Algebra1. It places emphasis on the study of abelian groups (the classifications of finite abelian groups) as well as Direct products. Furthermore, we study the sylow theorems and its application and we also study the Jordan–Holder theorem and solvable groups. Moreover, we study the unique factorization in polynomial rings and we provide a brief summary of Galois theory.

2 - Objectives of the course:

After completing this course, the student will be

1- Understand that the abstract algebra is the main theory of mathematics that study the important algebraic construction such as groups, rings, fields and other.
2- Familiar with the algebraic construction and its conditions.
3- Able to develop the ability to think logically and positively, and the development of his skill in dealing with the abstract proofs.

3 - Syllabus:

Group theory:Sylowtheorems , Applications of Sylow theory, Direct products, The classifications of finite abelian groups, Jordan –Holder theorem ,solvable groups.Ring theory: Unique factorization in polynomial rings and principal ideal domains.Field theory: Galois theory ,solvability of equations by radicals.

4 - Basic references:

1- I. N. Herstein, ‘’Topics in Algebra’’, John Wiley and Sons, 2006.
2- J.B. Farleigh, ‘’A first course in abstract algebra’’, Wesley Publishing Co. London, 7th edition, 2003.

5 - Assistance references :

1- - D. Dummit and R. Foote,’’ Abstract Algebra’’, John Wiley & Sons, 3rd edition, 2004.
2- Thomas W. Hungerford, ‘’Algebra’’, Springer, 2003.

Course Code	Course Title	Credits	Prerequisite
Math 621	**Number Theory**	**3**	**Math 601**

1 - Course Description:

Number Theory, the study of the integer numbers is one of the oldest branches of mathematics and yet it continues to be a very active area of research today. Number Theory is rich with beautiful theorems and elegant patterns. It's unsolved problems have challenged the greatest mathematical minds and given rise to much of modern mathematics. So, this course is designed as an introduction to number theory, suitedscientifically for students interested in developing their mathematical skills, and to enhance and reinforce the student's understanding of concepts through the theory of the integers from a list of axioms**.**

2 - Objectives of the course:

After completing this course, the student will be able to

1- Analyze/interpret the algebraic structure of the integers from a list of axioms.
2- Write clear and precise mathematical proofs for the properties of integers.
3- Apply his theoretical knowledge in number theory to handle some problems in applied mathematics and computer security.
4- Explore some current research problems in number theory.

3 - Syllabus:

Divisors, lest common multiples, linear Diophantine equations, primes numbers. Solutions of congruences, the Chinese remainder theorem, fundamental properties of congruences, residue system, reduced residue system and Euler's Φ, polynomial congruences, primitive roots, congruences of degree two, number theory from an algebraic viewpoint. The group of quadratic resides, the Legendre symbol, quadratic reciprocity, quadratic residues for prime power moduli. Arithmetic functions, definition of arithmetic functions and examples, multiplicative arithmetic functions, perfect numbers, the Möbius inversion formula with some application, properties of the Möbiusfunction,theDirichlet product. Diophantine equations, the use of congruences in solving Diophantine equations, Pythogo-rean triples, infinite descent method and Fermat's conjecture. Some applications to applied mathematics and computer security.

4 - Basic references:

1- Ivan Niven, Herbert S. Zuckerman, and Hugh L. Montgomery. An Introduction to Theory of Numbers . John Wiley 1991

5 - Assistance references:

1- . Kenth Rosen. Elementary Number Theory and its Applications, Pearson, 2011

Course Code	Course Title	Credits	Prerequisite
Math 622	**Topics in Algebra**	**3**	**Math 601**

Course Description:
The course discusses advanced topics in the field of Algebra. The topics in the course may vary from year to year

Course Code	Course Title	Credits	Prerequisite
Math 630	**Real Analysis 2**	**3**	**Math 602**

1 - Course Description:

Measure theory is the study of measures. It generalizes the intuitive notions of length, area, and volume. The earliest and most important examples are Jordan measure and Lebesgue measure, but other examples are Borel measure, probability measure, complex measure, and Haar measure. Measure theory is applied in various disciples of mathematics in probability theory and Ergodic theory. This course focus on the construction of the Lebesgue measure on the real line and deals with measurable functions, integration with to respect to Lebesgue's measure, the monotone convergence theorem,Fatou's Lemma, dominated convergence theorem and differentiation and integration.

2 - Objectives of the course:

On completion of this course; successful students are able to:

1- Learn the basic theorems and supply their proofs correctly.
2- Understand the concept of measurable sets and measure and how they are used inintegration.
3- Construct rigorous mathematical proofs of basic results in measure theory .
4. Apply monotone convergence theorem in proofs and in evaluating integrals.
5. Calculate the Lebesgue integral of some functions.

3 - Syllabus

Lebesgue Measure: Outer measure, measurable sets,countable additively, continuity, non-measurable sets.Lebesgue Measurable functions: Definition and examples of measurable functions, sum,product and composition, sequential limits and approximations, Egoroff's theorem and Lusin's theorem. Lebesguesintegration:The Lebesgue integral of a bounded measurable function,Lebesgue integral of a measurable nonnegative function, the monotone convergence theorem,the general Lebesgue integral, Lebesgue dominated convergence theorem.Differentiation and integration: Monotone functions, functions of bounded variation, absolutely continuous function, differentiating indefinite integrals.

4 - Basic references:

1- H.L.Royden and P.M.Fitzpatrick,'' Real Analysis'', Fourth Edition ; Prentice Hall,2010

6 - Assistance references :

1- Gerald .B. Folland ,''Real Analysis –Modern techniques and their Applications'', Second Edition ,John Wiley & Sons, 2013.
2- Walter Rudin ,''Real and complex analysis'', Third Edition ,McGraw-Hill, 1987.

Course Code	Course Title	Credits	Prerequisite
Math 631	**Topology**	**3**	**Math 602**

1 - Course Description:

Topology is an abstract study of mathematical concepts in some position ignoring the geometry of that position. Studying topology and the relations between the topological concepts increase the skills of the researcher and give him a deep and fair vision in most topics in pure mathematics

2 - Objectives of the course:

On completion of this course; successful students are able to:

1- Analyze topological concepts and its properties
2- Join between topological concepts and wave the value of that joint.
3- Understand the value of Topology in Pure Mathematics
4- Benefiting from Topology in some real life problems.
5-Knowing open problems and future researches

3 - Syllabus:

Topological spaces, neighborhood structures, continuous functions and topological homeomorphism, higher separation axioms, some types of connectedness, some types of compactness, metric spaces, product topology, quotient topology.

4 - Basic references:

1- AkosCsazar,'' General Topology'' Adm. Hilger LTD, Bristol, 1978,1978

5 - Assistance references :

1- M. A. Armstrong, Basic Topology, Springer, 1983

Course Code	Course Title	Credits	Prerequisite
Math 632	**Functional Analysis**	**3**	**Math 602**

1 - Course Description:

Functional Analysis is an advance course of analysis in which theory and concepts from calculus and analysis generalized and study in more details.

2 - Objectives of the course:

After completing this course the student will be familiar with :

1- The metric space and convergence and divergence of sequences in the metric space.
2- The diference between complete and incomplete metric spaces; and between normed and metric space and Banach space.
3- The topology generated by the norm.
4- The inner product space and Hilbert space.
5- Some open problems.

3 - Syllabus:

Metric Space: Metric Space, Continuous functions and Convergence in metric space, Complete Metric Space, Topology generated by Metric. Normed Space: Linear Space, Linear subspace, Normed Spaces, Relationship between Metric and Normed Spaces, Banach Space, Continuity and Convergence in Normed Spaces, Topology Generated generated by Norme.Inner Product Space: Inner product Space, Hilbert Spaces.

4 - Basic references:

1- E.Kreyzing ,''Introduction to Functional Analysis with Applications'', John Wiley and Sons, 1989.

5 - Assistance references:

1- 1 E.Kreyzing,''A Course in Functional Analysis'', 2th ed ., Springer, Berlin,(1990).
2- C.Goffman and G.Pedrick ,''First Course in Functional Analysis'', Prentice-Hall, (1974)
3- E.B.V.Limaye ,''Functional Analysis'', 2th ed., New Age International, New Delhi, (1996).
4- A. Taylor and Delay,'' Introduction to Functional Analysis'', Wiley, New York, (1980).

Course Code	Course Title	Credits	Prerequisite
Math 633	**Topics in Analysis**	**3**	**Math 602**

Course Description:

The course discusses advanced topics in the field of analytic. The topics in the course may vary from year to year

Course Code	Course Title	Credits	Prerequisite
Math 640	**Numerical Method for ordinary differential equation (ODEs)**	**3**	**Math 604**

1 - Course Description: Numerical methods for ordinary differential equations are methods used to find numerical approximations to the solutions of ordinary differential equations (ODEs). Many differential equations cannot be solved analytically, and a numeric approximation to the solution is often sufficient for some applications. The methods studied in this course can be used to compute explicitly approximation for the solution and provide an error analysis to test how far from the exact solution.

2 - Objectives of the course:

Students after studying the course are expected to:

4 Know the concept of numerical methods to solve ordinary differential equations.
5 Distinguish between the different types of numerical methods to solve ordinary differential equations.
6 Chose the appropriate method to solve ordinary differential equations.
7 Apply the appropriate methods to solve mathematical problems and prove the stability and convergence of the approximated solution.
8 Conclude the advantages of the methods used to solve ordinary differential equations in various fields.

3 - Syllabus:

One step methods. Runge-Kutta methods. Multistep and predictor-corrector methods. Numerical analysis including stability. Convergence and error analysis. Boundary-value problems.

4 Basic references:

1- Griffith and Higham,''Numerical Methods for Ordinary Differential Equations'',Springer ,2010.

5 - Assistance references :

1- Richard Burden and J.DougiasFaires,"Numerical Anlysis, Brooks/Cole Cengage Learning, 2011
2- AlfioQuarteroni ,Riccardo Sacco and Fausto Saleri, 'Numerical Mathematics ' Springer, 2007

Course Code	Course Title	Credits	Prerequisite
Math 641	**Numerical Method for partial differential equation (PDE)**	**3**	**Math 604**

1 - Course Description: Numerical methods for partial differential equations are methods used to find numerical approximations to the solutions of (PDEs). Many partial differential equations cannot be solved analytically, and a numeric approximation to the solution is often sufficient for some applications. The methods studied in this course can be used to compute explicitly approximation for the solution and provide an error analysis to test how far from the exact solution.

2 - Objectives of the course:

Students after studying the course are expected to:

1. Know the concept of numerical methods to solve partial differential equations.
2. Distinguish between the different types of numerical methods to solve partial differential equations.
3. Chose the appropriate method to solve partial differential equations.
4. Apply the appropriate methods to solve mathematical problems and prove the stability and convergence of the approximated solution.
5. Conclude the advantages of the methods used to solve partial differential equations in various fields.

3 - Syllabus:

Finite difference techniques for elliptic equations. Treatment of boundary conditions. Iterative methods. Successive ever relaxation method. Explicit and implicit method for parabolic equations. **Error analysis, stability analysis and convergence.** The method of characteristics for quasi-linear hyperbolic equations.

4 - Basic references:

1- K. W. Morton and D. F. Mayers,''Numerical Solution of Partial Differential Equations'',Cambridge University Press ,2005.

5 - Assistance references :

1- Richard Burden and J.DougiasFaires,"Numerical Anlysis", Brooks/Cole, Cengage Learnng 2011 .
2- AlfioQuarteroni ,Riccardo Sacco and Fausto Saleri, 'Numerical Mathematics ' Springer, 2007.

Course Code	Course Title	Credits	Prerequisite
Math 642	**Approximation theory**	**3**	**Math 604**

1 - Course Description: Approximation theory is concerned with how functions can best be approximated with simpler functions, and with quantitatively characterizing the introduced errors. The students, through this course will learn skills to prove convergence and existence for the solutions, and will be used to prove and conclude new results of mathematical theories.

2 - Objectives of the course:

Students after studying the course are expected to:

1. Know the concept of convergence.
2. Distinguish between theories of convergence.
3. Choose the appropriate mathematical approximation of the problem.
4. Apply appropriate theories to solve mathematical problems and prove the stability and convergence of the solutions.
5. Deduce some theories that can be applied in various numerical methods courses.

3 - Syllabus:

Introduction, Chebyshev polynomials and series, Weierstrass Approximation Theorem, Convergence for differentiable functions, Convergence for analytic functions, Best approximation, Best and near-best, Linear approximations, Nonlinear approximations,Spectral methods rational best approximation ,Rational interpolation and least-squares.

1- Basic references

1- Nick Trefethen ,'' Approximation theory and approximation practice'', Siam, 2013

2- Assistance references:

1- Elliott Ward Cheney, Jr,'' A course in approximation theory'',MMS Chelsea 2000
2- Michael J. D. Powell,''Approximation theory and methods''.Press of U. Cambridge, 1996

Course Code	Course Title	Credits	Prerequisite
Math 643	**Optimization**	**3**	**Math 604**

1 - Course Description

Problems in optimization are the most common applications of mathematics. The main aim of this course is to present different methods of solving optimization problems in the area of nonlinear programming. In addition to theoretical treatments, there will be some introduction to numerical methods for optimization problems.

2 - Objectives of the course

1. Recognize and formulate optimization problems,
2. Chooseappropriate solution technologies and strategies,
3. Interpret the solution of an optimization problem,
4. Analyze the effects of problem variation on the optimal solution.

3 - Syllabus:

a - Theoretical side:

Unconstrained Optimization Optimality Conditions ,Convex Unconstrained ,Optimization Optimality Conditions, Newton's Method , Quadratic Forms ,Steepest Descent Method ,Constrained Optimization Optimality Conditions ,Projection Methods for Equality Constrained Problems , Projection ,ethods/Penalty Methods ,Barrier Methods, Conditional Gradient Method ,Interior-Point Methods for Linear Optimization ,Analysis of Convex Sets and Convex functions,Duality Theory ,Subgradient Optimization ,Semidefinite Optimization.

b - The practical side (if applicable)

Using Matlab,or Mathematica software or any other programming software.

4 - Basic references:

1- Weny u Sun, Ya-Xiang Yua,'' Optimization Theory and Methods: Nonlinear Programming'', Springer. (2010).

5 - Assistance references

1- David G. Luenberger, Yinyu Ye, ''Linear and Nonlinear Programming'', International Series in Operations Research & Management Science ,Springer 2013

Course Code	Course Title	Credits	Prerequisite
Math 650	**Integral differential equations**	**3**	**Math 605**

1 - Course Description:

This course emphasizes concepts and techniques for solving integral equations from an applied mathematics perspective. Volterra and Fredholm theory, the Hilbert-Schmidt theorem; Wiener-Hopf Method; Wiener-Hopf Method; the Hilbert Problem and singular integral equations of Cauchy type. The models are taken from fluid and solid mechanics, acoustics, quantum mechanics, and other applications.

2 - Objectives of the course:

After finishing this course, the students will be able to:

1- Be familiar with integral equations .
2- Choose the appropriate method to use in studying integral equations.
3- Solve the problem involving integral equations.
4- Explore some integral equations that have different areas of research.

3 - Syllabus:

Integral equations and Picard's method, Existence and Uniqueness, Homogeneous and non-Homogeneous linear equations, The Fredholm Alternative-Hilbert-Schmidt Theory, Transform methods, Green's Functions and Boundary-value Problems, Elements of Theory of Fredholm Integral Equations, Wiener-Hopf Integral Equations, Voltera Integral equations, Nonlinear Integral Equations.

4 - Basic references:

1- MichioMasujima, ''Applied Mathematical Methods in Theoretical Physics-Integral Equations and Calculus of Variations'', Wiley-Vch. Verlag GmbH & Co. KGaA, 2005.

5 - Assistance references :

1- *Linear Integral Equations: Theory and Technique''*,Birkhauser, Boston, 1996
2- Stakgold, I.'' *Green's Functions and Boundary-value Problems''*. Wiley, NY, 1998

Course Code	Course Title	Credits	Prerequisite
Math 651	**Mathematical Modeling**	**3**	**Math 605**

1 - Course Description:

This course covers many mathematical models one variable, multivariable and computational optimization. It includes application on dynamic system and study of probability models.

2 - Objectives of the course:

After successful completion of this course , the student will be able to;

1- Learn to formulate and analyze mathematical models.
2- Understand stochastic models.
3- Apply Monte Carlo simulation.
4- Solve optimization problems computationally.
5- To analyze dynamic models.
6- Simulate models using MATLAB or Maple.

3 - Syllabus:

a - Theoretical side:

Optimization models (one variable and multivariable), discrete programming, discrete optimization. steady state analysis, dynamic system, discrete time systems, analysis of dynamic models, simulation of dynamic models. discrete and continuous probability models, stochastic models, Monte Carlo simulation, Markov property, particle tracking, fractional diffusion.

b - The practical side (if applicable):

Simulation techniques using MATLAB or Maple software.

4 - Basic references:

Mark M. Meerschaert,'' Mathematical Modeling'', 2nd edition, 2013., Elsevier, 2013

5 - Assistance references

1- Frank R. Giordano, William P. Fox, Steven B,'' A First Course in Mathematical Modeling'', 5th Edition,Horton, 2014.
2- Amos Gilat,'' MATLAB: An Introduction with Applications'', 5th Ed., Wiley ,2014.

Course Code	Course Title	Credits	Prerequisite
Math 652	**Differential Geometry**	**3**	**Math 605**

1 - Course Description:

Differential geometry is the study of geometric properties of curves using differential and integral calculus and linear algebra. It has a wide applications in the field of sciences in particular in physics, architecture, engineering, econometrics. The course focuses on the basic theory of curves,surfaces and manifolds. The topic covered include: differential manifolds, tangent vectors, curvature, Riemannian manifolds, and submanifolds of Riemannian manifold.

2 - Objectives of the course:

After completing the course, successful student is able to:

1.State and prove the basic theory in differential geometry.

2. Calculate and interpret the curvature of a curve.

3.Apply the theory of differential geometry to solve some practical problems .

3 - Syllabus:

Definition and examples of differentiable manifolds, tangent vectors, vector fields, differential forms and de Rham's theorem, tensors, the exterior derivatives, surfaces in R^3, Gaussian curvature, Affine connections, torsion tensor and curvature tensor of affine connection, Riemannian manifolds, Riemannian connections, Riemannian curvature tensor, submanifolds of a Riemannian manifold

1- Basic references:

1- N. J. Hicks ,''Notes on differential geometry'', Van Nostrand Reinhold Company, 2007

2- Assistance references:

1- U. C. De & A.A. Shaikh,'' Differential geometry of manifolds'', Ltd. Oxford, U.K., 2007.

2- Y. M. P. do Carmo ,''Differential geometry of curves and surfaces'', Prentice-Hall, Inc

Course Code	Course Title	Credits	Prerequisite
Math 653	**Topics in Geometry**	**3**	**Math 605**

Course Description:
The course discusses advanced topics in the field of geometry. The topics in the course may vary from year to year

Course Code	Course Title	Credits	Prerequisite
Math 660	**Mathematical Statistics 2**	**3**	**Math 606 &Math 607**

1 - Course Description:

This is the second graduate course in mathematical statistics and it aims to build a more advanced statistical theories and techniques. It provides a firm basis for advanced work on Statistical theory and its applications.

2 - Objectives of the course:

1- Knowing more advanced concepts of probability theory to build Statistical Theory.
2- Learning tools and techniques in Sampling Theory and Statistical Inference
3- Applying methods of Statistical Inference
4- Knowing Linear Models and application in regression and analysis of variance.
5- Learning concepts of decision theory and Nonparametric theory
6- Providing a firm basis for advanced work on Statistical Theory and applications.

3 - Syllabus:a - Theoretical side:

Theory of point estimation, Properties of estimators, including unbiasedness, efficiency, consistency, sufficiency, minimum variance unbiased estimator, Rao-Blackwell theorem and Rao-Cramer inequality. Methods of moments and maximum likelihood. Bayes' and minimax estimation. Sufficient and Minimal sufficient statistics. Tests of hypothesis, Neymann-Pearson theory of testing of hypotheses. UMP tests, UMPU tests, likelihood Ration tests, Unbiased and invariant tests. Confidence estimation. Confidence intervals (shortest length, unbiased and Bayes'). The general linear hypothesis, regression and Analysis of variance. Decision theory. Nonparametric statistical inference.

b - The practical side (if applicable): Using Computer Package for simulation and modeling

4 - Basic references:

1- John Freund ,''Mathematical Statistics'', Prentice Hall, 1992.
2- Casella and Berger ,''Statistical Inference'', Wadsworth and Brooks/Cole, Ca, 2001.

5 - Assistance references :

1- Lehmann ,''Theory of Point Estimation'', Wiley. 1983
2- Lehmann.''Testing of Statistical Hypothesis'', Wiley 1986
3- Peter Bickel and KjellDoksum ,''Mathematical Statistics'', Holden Day 1977
4- Ferguson ,''Mathematical Statistics'', Academic Press, 1986
5- Sahai and Ageel ,''ANOVA: Fixed, Random and Mixed Models'', Springer 2001

Course Code	Course Title	Credits	Prerequisite
Math 661	**Regression and Experimental Design**	**3**	**Math 606 &Math 607**

1 - Course Description:

This course is a global term that includes both the formal design of anexperiment and the regression analysis by which the result of theexperiment is analyzed. It provides the principles ofexperimental design and the techniques of analysis of variance in a manner that illustrates the aspects of statistical analysis. Also it covers important topic on screening design.

2- Objectives of the course:

(after successfully completion of this course, the student will be able to):

1- Understanding Least Squares methods and its properties
2- Work on linear regression and testing of intercept and slope.
3- Estimate parameters through regression analysis.
4- Construct regression analysis table to describe relationship between variables.
5- Understand the concept of residual analysis and prediction.
6- Explain the assumptions necessary to perform ANOVA
7- Describe appropriate ways to transform data are not normally distributed
8- Understand the importance of statistical design of experiments and its benefits

3 - Syllabus:a - Theoretical side:

Least Square Methods and Properties, Simple linear regression. Testing of intercept and slope. Simple and Multiple linear regressions with matrix approach. Estimation of parameters and testing of regression coefficients. Prediction and correlation analysis. , Development of Linear models, Residual Analysis and Prediction, Polynomial Regression, Dummy Variable, Model Building and Variable Selection. Analysis of variance techniques, Concepts of Statistical Designs and Linear Model. Completely randomized and randomized block designs. Latin square designs models: Fixed, random and mixed models. Incomplete block design. Factorial design, 2k factorial design and blocking and confounding in 2k factorial design

b - The practical side (if applicable):

Using R programming software, Minitab or any other computer packages for implementation of the methods.

4 - Basic references:

1- John O. Rawlings .''Applied Linear Regression: A Research Tool'', Wiley, 1988.
2- Montgomery D. C., John Wiley & Sons ,''Design and Analysis of Experiments'', New York, 2013.

5 - Assistance references :

1- Oehlert. G. W ,''A First course in Design and Analysis of Experiments'', University of Minnesota, 2010
2- Cox, D. R. and Ried, N ,''The theory of the design of experiment'', CHAPMAN & HALL / CRC, 2000

Course Code	Course Title	Credits	Prerequisite
Math 662	**Time Series Analysis**	**3**	**Math 606 & Math 607**

1 - Course Description:

The course is to present important concept of time series analysis such as stationary processes, autocorrelations, moving average,ARMA models, spectral analysis, etc. Also, it providessome detail of the theoretical foundations and practical applications of bivariate time series. This course is a mixture of theory and practical applications of time series methods.

2 - Objectives of the course:

(after successfully completion of this course, the student will be able to):

1- Knowing concepts and theory of time series
2- Understand stationary time series models.
3- Learn Autoregressive and model averaging.
4- Work on fitting of ARMA and related models.
5- Estimate spectral analysis
6- Learning ARIMA models and its fitting
7- Analyzebivariate timeseries
8- Utilize R programming or Minitab for computation and Analysis

3 - Syllabus:a - Theoretical side:

Trends, linear filters, smoothing. Stationary processes, autocorrelations, partial autocorrelations. Autoregressive, moving average, and ARMA process. Fitting of ARMA and related models. Forecasting. Seasonal time series. Spectral density of stationary processes. Periodogramsand estimation of spectral density. Bivariate time series, cross-correlations, cross-spectrum. Other topics as time permits. Extensive use of Computer Statistical Software

b - The practical side (if applicable):

Using R programming software or Minitab or any other Computer Software.

4 - Basic references:

1- Chatfield C,''The Analysis of times series'', 4th edition, Dover, 1993.
2- Jonathan D. Cryer,''Time Series Analysis'', Duxbury , 1986, 2008
3- G.E.P, Jenkins, G.M,'' Time Series Analysis, Forecasting and Control'', Box, Holden Day, 1976

5 - Assistance references:

1- Fuller W,'' Introduction to Statistical Time series'', Wiley 1990,
2- R. Shumway and D. Stoffer,''Times series analysis and its applications with R Examples'', 2006.
3- Kandal&Ord, J.K.''Time Series', Kandal&Ord, J.K., 3rd edition, Wiley , 1990.

Course Code	Course Title	Credits	Prerequisite
Math 663	**Topics in Mathematical Statistics**	**3**	**Math 606 & Math 607**

1 - Course Description:

This course is designed to cover important topics in Mathematical Statistics that may be desired from time to time for specific needs. It may also be used as a vehicle for development of new Mathematical Statistics course for graduate program students.

2 - Objectives of the course:

1- Bridging gaps between courses.
2- Learningmore advanced and further topics in Mathematical Statistics.
3- Providing a firm basis for advanced coursework on Statistical Theory

3 - Syllabus:

Theoretical side(Variable contents and can be changed from year to year). Thepractical side (if applicable)

Using computer Statistical Software and programming as possible.

4 - Basic references:

Variable references

5 - Assistance references:

Course Code	Course Title	Credits	Prerequisite
Math 670	**Probability Theory II**	**3**	**Math 606 &Math 607**

1 - Course Description:

This is the basic graduate course in measure-theoretic probability theory. This course covers topics in measure-theoretic probability and modern stochastic calculus. The material in this course is fundamental not only in abstract probabilistic analysis, but also in various applied areas such as communication theory, queuing theory, mathematical finance and mathematical physics

2 - Objectives of the course:

1- Learning the language and core concepts of Measure and Probability.
2- Learningfundamental theorems of measure-theoretic Probability
3- Learning applications and methods of measure and probability
4- Giving students some probabilistic intuitions and insight in thinking about problems
5- Providing a firm basis for advanced work on measure –theoretic probability and Stochastic Calculus.

3 - Syllabus:

LpConvergence, Uniform integrability.Skorokhod representation theorem. Convergence of series. The Kolmogorov three series theorem.Strong law large number. Central limit theorems for independent and non-identically distributed random variables. Speed of convergence. Large deviations. Laws of the iterated logarithm. Stable and infinitely divisible distributions. Martingales and applications. Random walk, counting and Poisson Processes, Brownian motion.

4 - Basic references:

1- Patrick Billingsely,'' Probability and Measure'', 2nd edition, , Wiley1986, 1995.
2- Richard Durrett,''Probability: Theory and Example'',
3- Sidney Resnick ,''Probability Path'', Birkhauser, 1999

5 - Assistance references :

1- Sheldon Ross Second Course in Probability Theory,
2- Allan Gut ,''A Graduate'' Course in Probability, Springer.
3- Kai, Lai, Chung ,''A course in Probability'', 2nd Edition, Academic Press.

Howard Tucker ,''A graduate course in Probability'', Academic Press.

Course Code	Course Title	Credits	Prerequisite
Math 671	**Reliability Theory and Life Testing**	**3**	**Math 606 &Math 607**

1 - Course Description:

This course focuses on the reliability systems and related distribution. It consists of failure rate functions and nonparametric classes, accelerated life testing, dependent failure analysis, statistical inference of reliability data.

2 - **Objectives of the course**:

(after successfully completion of this course, the student will be able to):

1- Understand structural properties of Coherent systems
2- Apply the concepts of reliability of coherent systems\itmc reliability functions of systems.
3- Familiar with the probability distributions in system reliability theory.
4- Identify classes of life distributions based on notions of aging and bounds of reliability functions.
5- Analyze bivariate and multivariate life distributions.

3 - Syllabus:

a - Theoretical side:

Hazard Structural Properties of Coherent Systems - Structural functions, union/intersection and intersection/union methods, Reliability of Coherent Systems \itmc Reliability functions of systems with either independent or dependent components, Families of Probability Distributions in System Reliability Theory, Classes of Life Distributions Based on Notions of Aging - IFR, IFRA, DFR, and DFRA families of distributions, partial orderings of life distributions and probability inequalities, Multivariate Distributions for Systems with Dependent Components.

b - The practical side (if applicable):

Using R programming software or any statistical software.

4 - Basic references:

1- R. Barlow and F. ProcshanStatistical Theory of Reliability and Life Testing.
2- Richard Barlow and F.Procshan ,''Mathematical Theory of Reliability'', Saim, 1996.

5 - Assistance references :

1- MavinRausand and ArnljotHoyland ,''System Reliability Theory; Models, Statistical Methods and Applications''، 2nd edition , John Wiley & Sons Inc Publications, 2004
2- Gnedenko, Igor Pavlov, Igor Ushakov ,''Statistical Reliability Engineering, John Wiley & Sons, Inc., New York, 1999
3- , Mohammad Modarres, Mark Kaminskiy and VasiliyKrivtsov ,''Reliability Engineering & Risk Analysis, A practical guide'', CRC Press, Taylor and Francis Group, 2009.

Course Code	Course Title	Credits	Prerequisite
Math 672	**Stochastic Processes**	**3**	**Math 607 & Math 606**

1 - Course Description:

This is the first graduate course in Stochastic Processes. It is a non-measure theoretic introduction to stochastic processes and as such assumes knowledge of calculus and probability. It gives the basic of stochastic processes to indicate its diverse range of applications and to give students some probabilistic intuitions and insight in thinking about problems.The materials of this course are also essential for other applied areas and various field. This course is also designed for those graduate students who are going to need to use stochastic processes in their research but do not have the measure-theoretic backgrounds.

2 - Objectives of the course:

1- Understanding the theory and basic concepts of Stochastic Processes
2- Leaning different forms of stochastic processes and its diverse range of applications.
3- Having some probabilistic intuitions and insight in thinking about problems.
4- Developingprobabilistic problems-solving skills
5- Providing a firm basis for advanced work on stochastic processes

3 **- Syllabus:**

a - Theoretical side:

Simple random walk as approximation of Brownian motion. Discrete time Markov chains. Continuous time Markov chains; Poisson, compound Poisson, and birth-and-death chains; Kolmogorov's backward and forward equations; steady state. Diffusions as limits of birth-and-death processes. Examples drawn from diverse fields of application.

b - The practical side (if applicable):

Using computer Software and programming, as its possible.

4 - Basic references:

1- Sheldon Ross ,''Stochastic Processes'', Wiley, 1996

5 - Assistance references :

1- S. Karlinand H. Taylor ,''A First Course in Stochastic Procesees'', Academic Press, 1975
2- Sidney Resnick ,''Adventures of stochastic Process'', Birkhauser, 1992
3- Cinlar, E ,''Introduction to Stochastic Procesees'', , Prentice Hall, 1975

Course Code	Course Title	Credits	Prerequisite
Math 673	**Topics in Probability Theory**	**3**	**Math 606 & Math 607**

1 - Course Description:

This course is designed to cover important topics in Probability Theory that may be desired from time to time for specific students in the graduate program. It may also be used as a vehicle for development of new Probability course for graduate program students.

2 - **Objectives of the course:**

1- Learn more advanced and further topics in probability theory.
2- Ability applying theories and methodologies to solve problems that arise in other disciplines.
3- Providing a firm basis for advanced coursework.

3 **- Syllabus:**

a **- Theoretical side**

Variable contents and can be changed from year to year.

b - The practical side (if applicable):

Using computer Statistical Software and programming as possible.

4 - Basic references:

5 - Assistance references :

متطلبات البرنامج حسب المستويات الدّراسيّة

First Level					المستوىالأول			
Course Title	Course Number & Code	متطلب المقرّر	الوحدات الدراسية		الوحدات المعتمَدة	اسم المقرّر	رمزالمقرّر ورقمه	م
			عمليّ	نظريّ				
Compulsory			-	3	3	اجباري		1
Compulsory			-	3	3	اجباري		2
Compulsory			-	3	3	اجباري		3
Compulsory			-	3	3	اجباري		4
Total Credits for First Level				12		مجموع وحدات المستوى الأول		

Second Level					المستوى الثاني			
Course Title	Course Number & Code	متطلب المقرّر	الوحدات الدراسية		الوحدات المعتمَدة	اسم المقرّر	رمزالمقرّر ورقمه	م
			عمليّ	نظريّ				
Compulsory			-	3	3	اجباري		1
Elective			-	3	3	اختياري		2
Elective			-	3	3	اختياري		3
Elective			-	3	3	اختياري		4
Total Credits for SecondLevel				12		مجموع وحدات المستوى الثاني		

Third Level						المستوى الثالث		
Course Title	Course Number & Code	متطلب المقرّر	الوحدات الدراسية		الوحدات المعتمَدة	اسم المقرّر	رمزالمقرّر ورقمه	م
			عمليّ	نظريّ				
Elective			-	3	3	اختياري		1
Elective			-	3	3	اختياري		2
						رسالة		3
Total Credits for ThirdLevel				6		مجموع وحدات المستوى الثالث		

Fourth Level						المستوى الرابع		
Course Title	Course Number & Code	متطلب المقرّر	الوحدات الدراسية		الوحدات المعتمَدة	اسم المقرّر	رمزالمقرّر ورقمه	م
			عمليّ	نظريّ				
Thesis	699				6	رسالة	699	1
Total Credits for FourthLevel				6		مجموع وحدات المستوى الرابع		

مراجعة طلب استحداث برنامج دراسات عليا جديد
(خاص بعمادة الدراسات العليا)

1. بيانات أولية:

- البرنامج :
- القسم :الرياضيات
- الكلية : العلوم

2. مراجعة النماذج

- تم الالتزامبالنماذج نعم □لا □

أهداف البرنامج	أهمية البرنامج	الاحصاءات	الإمكانات المتاحة	الإمكانات المطلوبة لبدء تنفيذ البرنامج	المتطلبات الدراسية

أسماء أعضاء هيئة التدريس	المعامل	الكوادر	المقررات الدراسية	توصيف المقررات

تلخيصإفادات الكلية

	نعم	لا
1.هل الفلسفة والأهداف والهيكل التنظيمي للبرنامج واضحة ؟		
2. هل الاتجاهات المرسومة للبرنامج موائمة لفلسفةوأهداف الجامعة؟		
3. هل عمر القسم المرشح لتقديم البرنامج لايقل عن 5 سنوات؟		
4. هل هناك حاجة ملحة للبرنامج؟		
5. هل عناصر التميزفي البرنامج واضحة؟		
6. هل توجد ازدواجية بين هذا البرنامجوالبرامجالأخرى في الجامعة وخارجها؟		
7. هل الإمكانات متوفرة لبدء البرنامج في القسم في المجالات الآتية:		
- أعضاء هيئة التدريس.		

- مساعدو الباحثين.		
- الفنيون والإداريون.		
- المعامل والورش.		
- مصادر التعلم وخدمات المكتبات.		
- تجهيزات الحاسب الآلي المركزي والفرعي.		
- التدريب العلمي والميداني.		
8. هل تم استيفاء المتطلبات الدراسية ومتطلبات التدريب العلمي والميداني وفق ما جاء في لائحة الدراسات العليا وقواعدها التنفيذية؟		
9. هل شروط البرنامج الخاصة لا تتعارض مع ما جاء في لائحة الدراسات العليا؟		
10. هل هناك طلبات للالتحاق بالبرنامج؟		

11. ملاحظات عامة:

دليل تعبئة نموذج برنامج دراسات عليا

تنبيهات عامة تؤخذ في الاعتبار عند تعبئة النموذج	• يتم تحميل النموذج المناسب لعدد مسارات البرنامج المقترح. • يتم الالتزام الكامل بالنموذج شكلا و موضوعا. • يجب تعبئة جميع البنود المطلوبة. • يجب ألا يرسل النموذج لعمادة الدراسات العليا قبل اعتماده من قبل رئيس القسم وعميد الكلية. • يجب أن يكون للبرنامج منسق من قبل القسم العلمي. • لاستحداث برنامج جديد يجب ملء جميع بنود النموذج ماعدا (21), (30), (31). • البند (15) خاص بالبرامج الخاصة مدفوعة التكاليف فقط. • يتم تحميل نماذج التقييم من الموقع الإلكتروني للعمادة وترسل لجهات علمية متخصصة وليس لأشخاص ولا يتم تقديم نموذج الاستحداث أو التطوير لعمادة الدراسات العليا إلا بعد التقييم والأخذ في الاعتبار بآراء المقيّمين. • يلزم إرفاق نسخة إلكترونية (قرص ممغنط) من النموذج مع النسخة الورقية.
(1) الكلية	يتم كتابة اسم الكلية.
(2) القسم العلمي	يتم كتابة اسم القسم العلمي.
(3) الدرجة وأسلوب الدراسة	يتم اختيار الدرجة وأسلوب الدراسة المطلوبين من أحد الخيارات التالية: • دبلوم عالي • ماجستير بالمقررات الدراسية و الرسالة • ماجستير بالمقررات الدراسية و المشروع البحثي • دكتوراه بالمقررات الدراسية و الرسالة • دكتوراه بالرسالة و بعض المقررات الدراسية
(4) نظام الدراسة	يتم اختيار نظام الدراسة من أحد الاختيارات التالية : • انتظام • تعليم عن بعد • تعليم مدمج
(5) نوع البرنامج	يتم اختيار نوع البرنامج من حيث كونه: • عام • خاص (مدفوع التكاليف)
(6) التخصص العام	يكتب التخصص العام للبرنامج.
(7) التخصص الدقيق	يكتب التخصص الدقيق لكل مسار (مسارات متعددة) باللغتين العربية و الإنجليزية.

يتم كتابة اسم الدرجة العلمية للبرنامج, بحيث يكونكأحدالأمثلة التالية:

(8) اسم الدرجة العلمية	الماجستير في الآداب (التخصص العام / التخصص الدقيق)	M.A. (Main Specialization / Minor Specialization)
	الماجستير في العلوم (التخصص العام / التخصص الدقيق)	M.Sc. (Main Specialization / Minor Specialization)
	الماجستير في الإدارة العامة	M.P.A.
	الماجستير في إدارة الأعمال	M.B.A.
	الماجستير في الأنظمة	L L.A.
	الدبلوم العالي في التربية (التخصص)	H.D.Ed. (Specialization)
	الماجستير في التربية (التخصص)	M.Ed. (Specialization)
	الماجستير في الاقتصاد المنزلي (التخصص)	Master of Home Economics (Specialization)
	الماجستير في التخطيط الحضري والإقليمي (التخصص)	Master in Urban and Regional Planning (Specialization)
	الماجستير في العلوم الطبية (التخصص)	Master of Medical Sciences (Specialization)
	ماجستير العلوم الصيدلية (التخصص)	Master of Pharmaceutical Science (Specialization)
	دكتوراه الفلسفة (التخصص العام / التخصص الدقيق)	Ph.D. (Main Specialization / Minor Specialization)

(9) لغة التدريس	يتم اختيار لغة التدريس من القائمة المنسدلة: • عربي • إنجليزي • فرنسي
(10) التاريخ المقترح لبدء البرنامج	يتم اختيار العام الدراسي المقترح لبدء البرنامج.
(11) لغة الرسالة العلمية	يتم اختيار لغة الرسالة العلمية من أحد خيارات: • عربي • إنجليزي • فرنسي
(12) عدد الطلاب المتوقع قبولهم	يكتب عدد الطلاب المتوقع قبولهم في البرنامج وليس المتوقع تقدمهم للبرنامج.
(13) الخبرة العلمية للقسم	يعبأ الجدول ويراعى كتابة التواريخ بالتقويم الهجري.
(14) شروط القبول	تكتب الشروط الخاصة بالقسم والتي لم تنص عليها اللائحة الموحدة للدراسات العليا في الجامعات وقواعدها التنفيذية بجامعة جازان.
(15) تكلفة الوحدة الدراسية وإجمالي تكاليف البرنامج	هذا البند خاص بالبرامج الخاصة المدفوعة التكاليف, ويتم كتابة تكلفة الوحدة الدراسية وعدد الوحدات والتكلفة الإجمالية, ويجب أيضا إرفاق محضر عمادة خدمة المجتمع والتعليم المستمر.
(16) أهداف البرنامج	تكتب أهداف البرنامج مختصرة وفي نقاط ويراعى أن تكون الأهداف قابلة للقياس وتوضح التالي: • خدمة البرنامج للعملية التعليمية • خدمة البرنامج للبحث العلمي • خدمة البرنامج للمجتمع

(17) أهمية البرنامج وحاجة المجتمع له	تكتب أهمية البرنامج مختصرة وفي نقاط ويراعى توضيح حاجة المجتمع للبرنامج وتأثيره على المجتمع.
(18) الجهات التي يمكن أن تستفيد من البرنامج	تكتب أسماء الجهات والهيئات والوزارات (التي يمكن أن تستفيد من البرنامج) في نقاط.
(19) البرامج المشابهة في جامعات المملكة الأخرى	تكتب أسماء البرامج المشابهةللبرنامج المقترح في جامعات المملكة الأخرى من حيث الاسم والمحتوى .
(20) اختلاف البرنامج عن البرامج المشابهة	يذكر باختصار وفي نقاط مدى اختلاف البرنامج المقترح عن البرامج المشابهة من حيث المقررات والمحتوى وعدد الوحدات الدراسية للبرنامج و عدد الوحدات الإجبارية والاختيارية .
(21) الأسباب الداعية لتطوير البرنامج الحالي	هذا البند يعبأ فقط عند طلب تطوير برنامج قائم ويذكر فيه الأسباب التي دعت القسم العلمي لتطوير البرنامج الحالي.
(24) & (25) أعضاء هيئة التدريس	• يراعى ترتيب أعضاء هيئة التدريس حسب الدرجة العلمية ثم الأقدمية. • يذكر التخصص الدقيق لكل عضو هيئة تدريس.
(26) & (27) الفنيون و الإداريون	يتم ترتيب الفنيين و الإداريين و الفنيات و الإداريات حسب المؤهل أولا ثم حسب سنوات الخبرة
(32) التعديلات المقترحة في المقررات الدراسية	• هذا البند يعبأ فقط عند طلب تطوير برنامج قائم ويذكر فيه أسماء المقررات الدراسية التي تم استحداثها والمقررات التي تم إلغاؤها بالإضافة إلى المقررات التي تم الإبقاء عليها. • يكتفى بكتابة اسم المقرر باللغة العربية فقط.

(36) قائمة مقررات الدرجة العلمية

ترقم مقررات الدراسات العليا حسب قرار مجلس عمادة الدراسات العليا كالتالي:

- يعطى كل مقرر رقماً مكوناً من ثلاثة أرقام.
- الرقم المئوي يعطى للدرجة ويكون على النحو التالي:

	جميع الكليات عدا كليات الطب و الصيدلة وطب الأسنان	كليات الطب والصيدلة وطب الأسنان
الدبلوم	5	7
الماجستير	6	8
الدكتوراه	7	9

- الرقم العشري يعطى للتخصص ويكون على النحو التالي:

الرقم العشري	مثال لدرجة الماجستير	المقررات
1،0	الأرقام من 600، 601، 602، 603،... إلى 619	المقررات الإجبارية والأساسية بالقسم
2	الأرقام من 620، 621، 622،... إلى 629	التخصص الدقيق الأول
8-3	الأرقام من 630، 631، 632،... إلى 639 الأرقام من 640، 641، 642،... إلى 649 الأرقام من 650، 651، 652،... إلى 659	التخصص الدقيق التالي التخصص الدقيق التالي التخصص الدقيق التالي
9	690، 691، 692،... إلى 699	المقررات الخاصة

- بالنسبة لكلية طب الأسنان، يمكن استخدام الرقم العشري "2" أيضاً ضمن المقررات الأساسية، وبذلك تصبح الأرقام المخصصة للمقررات الأساسية والإجبارية لهذه الكلية: من 600، 601، 602، 603، ... إلى 629 .
- في حالة الحاجة في أحد التخصصات الدقيقة لأكثر من رقم عشري واحد، فيخصص له أرقام عشرية متتالية (مثلاً: 620، 621، .... ، إلى 639).
- رقم الآحاد يرمز لتسلسل المقررات حسب اعتماد أحدهما على الآخر كمتطلب سابق، ويسبق المتطلب السابق المقرر الذي يعتمد عليه.
- يحتفظ الرقم العشري 9 مع أرقام الآحاد للمقررات المعينة الخاصة كالتالي:

رقم الآحاد	الرقم العشري	الرقم كاملاً	مثال لدرجة الماجستير	المقرر
9	9	99س	699	الرسالة
8	9	98س	698	المشروع البحثي
7	9	97س	697	موضوعات خاصة أو مختارة (2)
6	9	96س	696	موضوعات خاصة أو مختارة (1)
5	9	95س	695	ندوة بحث
4	9	94س	694	طرق البحث العلمي

(حيث إن س ترمز للأرقام 5 ، أو 6 ، أو 7 أو 8 أو 9حسب الدرجة)

- في حالة استحداث أو وجود مقررات أخرى لا يسعها الترقيم أو في حالة الحاجة إلى تكرار مقرر معين باسم آخر وخصوصاً من المقررات الخاصة، فيتم استخدام الأرقام 90، 91، 92، 93 علماً بأنه تم تثبيت الرقم 96 للموضوعات الخاصة (أو المختارة) (1) والرقم 97 للموضوعات الخاصة (أو المختارة) (2).

يجب التأكد من أن يكون رمز ورقم المقرر الذي يدرس من خارج القسم له نفس رمز ورقم المقرر في القسم الذي يقوم بتدريسه مع ضرورة إرفاق خطاب من القسم المعني بالموافقة على تدريس هذا المقرر.

(37) توصيف المقررات

- يتم كتابة وصف مختصر للمقرر يتضمن الهدف من تدريس المقرر والنتائج التي ستعود على الطالب من تدريسه.
- يتم ترتيب المقررات في التوصيف تصاعدياً حسب تسلسل الأرقام.

(38) عرض البرنامج على جهات خارجية للتقييم

يذكر الجهات التي تم عرض البرنامج عليها ثم يتم التعليق على ما أخذ به و ما لم يؤخذ به من آراء المقيّمين و لماذا