MATHEMATICS PROGRAM HANDBOOK

Abstract

This is the programme Handbook which inform the visitor of the website about the history of the programme, academic rules and regulations for studying at Majmaah University, programme study plan and courses' modules (courses' specifications)

Academic Year 1436-1437

CONTENTS

S	Title	Page Nº
1	Contents	1
2	Contact with the Programme	2
3	About the Programme	3
4	Teaching Staff	4
5	Vision , Mission and objectives	5
6	Study System	6
7	Academic Definitions	7
8	Program General Committees	16
9	Study Plan and Manual courses description	18

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About the Programme

Mathematics is one of the most important sciences that deals with the basic and applied aspects that contribute to the development and progression of the society through graduating qualified academic and professional students that contribute effectively in various fields of society development.

Mathematics programme is one of the main departments in the College of Education - Zulfi at Majmaah University since its establishment in 1421 H.

The programme established in 1413 H; as a one of the scientific departments of the Intermediate College for Preparing Primary School Teachers / Girls Colleges Agency - as (Mathematics and Science department).

When the programme included in College of Education; the study plan was changed to be compatible with the mission of the whole Educational Faculties in the Kingdom; then it aims to prepare qualified academic and professional students in various Educational sections.

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Vision, Mission and Objectives

Leadership in achieving excellent outcomes in mathematics and its applications and contribute in the enrichment of the knowledge society.

Graduating pedagogical and scientific qualified efficiencies by intended excellent educational programs according to the National transformation program of 2030 Vision to satisfy the Society requirements.

Objectives

1. Have the ability to understand and apply Mathematical information correctly.

2. The student contributes in the scientific and knowledge progress by the academic scientific researches.

3. Develop the curriculum continuously according to the Quality Standards.

4. The student use computer programs and languages to solve mathematical problems.

5. Prepare the student to participate in the scientific conferences, seminars, training courses and activate the small projects.

Study System

Study System Methodology:

Bachelor:

Student in Faculty of Education spend four years / eight semesters. Study Plan courses are basic courses includes (University requirements, College requirements and programme requirements). Student must study 316 units/144 credit hours.

Programme Entry Requirements:

- General Assimilation of the programme
- General cumulative grade point average of the student
- student Desires

Environment and society services:

- Teaching of mathematics and statistics courses at different colleges.
- Participation in research projects for Environment and society service.
- Participation in various internal and external committees of the college.
- Participation in cultural and scientific activities at the college and university.

Professional Opportunities for the graduates:

- Work in public and private education fields.
- Work as a Demonstrator in the department or in any mathematical department in the Kingdom.

- Work in research centers.

Academic Definitions

Free courses (Elective):

Are courses studied by student according to her will and desires inside the college or outside the college but in the university. Student registrated it with the assistant of the academic supervisor.

The Study Year:

Two terms beside summer term, if needed.

The Term (Semester):

A period of time not less than fifteen weeks without registration and final exam period; during it study plan courses are studied.

Summer Term:

A period of time not more than eight weeks, not including the registration and final exam period. The period(credit hours) for each course per week is doubled in it.

The Study grade:

It indicates the study level. It consists of eight grades or more to be a graduate according to the accredited study plan.

The Study Course:

Study material for specific grade included in the study plan of each discipline(programme).

Each course has a number(code), symbol, name and a detailed description of its vocabulary distinguishes it from the other courses according to the content and the grade.

Also every course has a special file maintained by the program in order to follow, evaluate and progress.
Some courses has one or more pre-courses and some has a co-current ones.

The Study Unit:

The theoretical lecture during the week that not less than fifty minutes, or the clinical lesson which does not less than fifty minutes, or practical and training lesson not less than a hundred minutes.

Academic Warning:

Anotice given to the student because of her decreasing cumulative average from the minimum scale showed in the registration.

Mid-term Mark:

The mark given for the activities to show the student achievement during the semester (tests, researches and educational activities) related to the study course.

The Final test:

A course test given once a time in the end of the term.

The final test Mark:

The mark achieved by the student for each course in the final test of the term.

The Final Degree:

The sum of Mid-term Mark and The Final test for each course. It is out of hundred.

The Grade:

The percentage description or the alphabetical symbol for the final degree gained by the student in each course.

In completed Grade:

A temporarily grade for each course that the student is unable to complete its requirements in its certain time. It symbolized in her academic record as (L) or (IC).

Continuous Grade:

A temporarily grade for each course that its studying structure needs more than one term to be completed. It symbolized in her academic record as (M) or (IP).

The Term Average:

The total points gained by the student divided by the total units of the whole courses studied in each term.

Points:

The planned unit multiplied by the weight of the grade which achieved by the student in each course studied.

Cumulative Average:

Total points of all courses studied from enrollment to graduation divided by the total units of these courses.

Total Grade:

Describe the educational attainment level of the student during her period of study at the university.

Minimum Level of the Study Load:

Minimum number of Study units (credits units) that should be recorded by the student and suitable with her cumulative average that determined by the University Council.

Levels' System:

A studying system that the academic year is divided into two main terms. There may be a summer term, its period is half the period of the main term.

Absence:

Student should attend regular lectures and practical lessons. She deny entering the final test if her absence average exceeds (25%) out of the total lectures and practical lessons specified for each course during the term. Student who was denied entering the final test due to her absence is treated as failure in that course. It symbolized in her academic record as (H) or (DN).

Medical reports are considered within the absence rate of 25%, except for specific inpatient hospitalization or the arrest in the security building.

Student who absence in the final test gained zero degree in that test, and calculated her grade in that course according to her midterm marks.

If the student was unable to attend the final test because of any critical excuse, the College council in extreme cases can accept her excuse and allow a substitution test given within a period not exceeding the end of the next term and give her grade after her substitution test.

Apologies From the Study:

Student may apologize from continuing the study of a term without treated her as a failure If she presents an acceptable excuse to the deanship of the college to which she belongs, at least before

three weeks from the beginning of the final test. Also she may withdraw by an excuse from a course or more in the term according to the implementing rules decided by the university council.

This case symbolized in her academic record as (P) or (DN).

This term is calculated with the period needed to finish the requirements of the graduation.
Excuse terms should not exceed two sequential terms or three non-sequential terms.
For students of colleges that apply academic year system it is not permissible to apologize for two consecutive years and the nonconsecutive apology years should not be exceeding two years whenever she is in the university, then she may dismissed and the deanship of Admissions and registration has an excursion about that.
Deanship of Admissions and registration can request for the acceptance of her appliation when she introduce for excuse of the term.

Apologize, withdraw and dropout:

The student may withdraw from a course or more according to the following conditions:

1. The college dean acceptance.

2. Held a withdraw request from a course before the end of the apologize appointment of the term.

3. Record (P) for the student or for the course she apologized from.

* The student may request for study delay before the end of the first week of the study starting according to acceptable excuse from the dean of the college , the period of delay shall not exceed two consecutive terms or three non-consecutive terms as maximum during her being in the university and then dropout.

The university council if necessary give an exception and will not include it in the actual period of the graduation requirements.

4. If a regular student absents for four weeks from the beginning of the term without delay request she will dropout from the university.

Affiliates student are dropout from the university if she absents from all final tests of the term without an acceptable excuse.

5. The student will not treated as an absence one for the courses studied by the student as a visitor in another college.

6. The dropout student can be retain back by the same university number and file before discontinuous:

1. Present a request to retain back during four terms dropout appointment.

2. The college council and the relevant authorities Council accept to re-start the student.

If the period of the dropout is more than four terms the student can retain back and register as a new student, without retain back to her previous file with all applicable admission requirements . The University Council can excludes some points according to regulations issued by the regulation.

3. Student retain back is not executed more than once and the university council excludes if necessary
4. Student retain back cannot be if the student folded by academic dismiss.
5. Student retain back is not executed if it happened by educational or disciplinary reasons or that dismissed from another university by disciplinary reasons, and if after retain back they find out these reasons she will dropped out since the retain appointment.

Dismiss from the university:

First: the student dismissed from the university in the following cases:

If she get three sequential warnings according to her cumulative average less than near (2.11) and the College Council has the authority of giving a fourth chance to those who can raise their cumulative average by studying the available courses according to the following rules:
1. The reason of the academic stumbled is well known to the College council.
2. There is an improvement in student performance in the last two terms. This is calculated by the total points of the two term divided by registered units, at least it must be (2.00) out of (5.00) and summer term is not included.

Second: The College Council may give the dismissed students who finish the double period of the programme study a chance at least not exceeded than two terms according to the following rules:

1.The reason of the academic stumbled are acceptable by the college council.
2. The remaining courses for the students may take at least two terms
3. There is a clear improvement in her performance. This is calculated by the total points of the two term divided by registered units, at least it must be (2.00) out of (5.00) and summer term is not included, and the president of the university may excuse some cases in case the colleges counted out all cases and held them in their councils and inform the dean of registration and

acceptance before a week from starting the term.

Third: The Academic Affairs Committee according to the recommendation of the dean of the college may give the students who dismissed by academic warnings a chance for not more than two terms.

Student grade for each course

Degree out of 100	**Grade**	**Grade symbol**	**Grade weight out of (5) (grade)**	**Grade weight out of (4) (points)**
100 - 95	**high Excellent**	**A+**	**5.00**	**4.00**
90 - 95	**Excellent**	**A**	**4.75**	**3.75**
85 - 90	**high Very good**	**B +**	**4.50**	**3.50**
80 - 85	**very good**	**B**	**4.00**	**3.00**
75 - 80	**High Good**	**C +**	**3.50**	**2.52**
70 - 75	**good**	**C**	**3.00**	**2.00**
65 - 70	**high Pass**	**D +**	**2.52**	**1.50**
60 - 65	**Pass**	**D**	**2.00**	**1.00**
to less than 60	**Fall**	**F**	**1.00**	**0**

The total cumulative average grade for the student when she graduated is calculated according to her cumulative average as follows:

Excellent:
If the cumulative average is 4.50 out of 5.00 or 3.50 out of 4.00

Very good

If the cumulative average is (3.75 - 4.50) out of 5.00

Good

If the cumulative average is (2.75 - 3.75) out of 5.00

Pass

If the cumulative average is (2.00 - 2.75) out of 5.00

Honor degree:

The student can gained the honor degree as follows:

1. First degree from (4.75 – 5.00) out of 5.00 or (3.75 – 4.00) out of 4.00
2. Second degree from (4.25 – 4.75) or (3.25 – 3.75)

First and second honor degree required:

1. Student did not fail in any course taught in the university or other university.
2. The student complete the graduation requirements in a maximum period between the min and max period of being in the college.
3. The student study at least 60% of the graduation requirements in the university from which she will graduate.

Examinations :

1. No allowance to enter the final exam after half an hour from the beginning, and no allowance to exit from the examination hall before the half time from the beginning of the appointed exam time.
2. Cheating In the exam or attempted it and contrary of the instructions and rules of conducting the exam punished the student according to the student disciplinary issued from the university council.
3. The council of the college where the courses are studied can decided in necessary cases, and accept the re-check of the exam answering papers in a period not more than the beginning of the next term examination according to the following rules:

1. The student may submit a request for re-check her answering paper to the program which teaching the course.
2. The request held on to the college council in a period not more than one month from the end of the final examination period for the term she want the re-check of one of its

course paper.

3. There is a form includes the student's name, university code number, course number and symbol, section, code, term number, absence rate, cumulative average, warnings, teaching staff name, test date,justifications of re-check and a pledge from her for the trust of these information .

In case of the acceptance of re-check college council consult a committee of at least three teaching staff for re-check and held a report .The college council decides and that will be the final decision.

Transfer from a university to another university:

from the approval of the Dean of the college to which the student desires to transfer her request may accepted according to the following rules:

1. The student studied in a college or an accredited university and she has an academic record(with cumulative average) for at least two terms.

2. The student was not dismissed from the university which transferred from because of disciplinary reasons.

3. The transfer rules specified by the College council is applicable in her case.

4. The number of studied credit units that are required from the student who transfer is not less than (61%) in Majmaah University out of the total units required for the bachelor degree in the university.

5. The council of the college in which the course is studied qualified the courses passed by the student outside the university on the recommendation of the programmes that teach these courses, and demonstrated in her academic record, but it will not include in her cumulative average unless the course specification of both passed and qualified courses are the same.

6. If after the transfer the council find that the student dismissed because of disciplinary reasons she dropped out at the date of her transfer acceptance appointment.

7. After the approval of the dean of the college student may transfer from one specification to another inside the college if her cumulative average allow that.

8. Demonstrate in the academic record of the transferred student from one specification to another all the courses she had studied.

Visiting student:

Visiting student is a student who study some courses in other university or at a branch of her university without transfer,

Her courses qualified according to the following rules:

First: A student at Majmaah University and would like to study as a visitor in another university:

1. A previous approval from the student college to allow her to study as a visiting student after determining courses to be studied, and the college can require particular average when qualifying a certain course, and send an official letter from the dean of Admission and Registration to the student.
2. The study must be in accredited college or university.
3. The course which she want to study outside the university must qualify -in specification - a course of the graduation requirements.
4. The maximum level of the credit units which accepted from outside the university must be (21%) out of the total units of the graduation from Majmaah University.
5. Courses averages which qualified for the visitor student do not included in her cumulative average, but registered in her academic record
6. The visitor student must support Admission and Registration Deanship by her results during two weeks from the beginning of the sequential term and if she does not attend her result she treated as a dropped out student (not including summer term).
7. The monthly reward are paid for the visiting student by hand if she deserves if after providing the Deanship of Admission and Registration by her remarks.

Second: Student from another university and wants to study as a visitor student in Majmaah University:

1. The student has academic record (with cumulative average) at least for one term from the university she has accepted in.
2-Gained previous written approval from her university to study as a visiting student in Majmaah University, and mentioned in the letter which courses she want to study.
3. The maximum terms that allows to the visiting student to be studied are two terms and the dean of Admissions and Regression may have exception from that.
4. The visiting student from another university doesn't have monthly reward from Majmaah University.
5. Record courses for the student from the deanship of Admission and Registration with regard to all rules of the courses' registration.

Students rewards:

Monthly reward is paid for the students according to following rules:

1. The student average is not less than two(2).

2. Studying hours are not less than twelve hours (12).

Note: Deanship of the Admission and Registration is response about following-up and giving the rewards.

General program Committees

The Supervisor Committee of the program:

Its roles are:

1. Supervise the implementation of the Action Plan Programme.
2. Select the advisor who assist in the rehabilitation of the programme according to the accreditation standards and in coordination of Quality and Development Committee.
3. Complete all academic accreditation requirements in the programme according to the National Commission for Adoption and **Accreditation Standards (NCAAA).**
4. Follow-up and coordination with the Development and Quality Committee in the college and held reports to it.

Evaluation and Accreditation Committee:

Its roles are:
1. Supervision, follow-up, preparation and collection of (the programme and courses) specification and reports.
2. Follow-up the preparation of the program self-study (SSR) and specialization as well as to visit the residents during periods of programmatic Calendar.
3. Present a periodic report about the extent of completion of Academic Accreditation requirements.
4. Supervise the preparation of exams and its modeling Answers for all courses.
5. Supervising the availability of teaching and learning for students in coordination with the committees concerned department.

Development and Quality Committee:

Its roles are:
1. Follow-up, management and development processes of quality adjustment.
2. Choose the standard reference for the program.
3. Supervision and follow-up the future development and planning plans.
4. Follow-up the current trends in the methodology and techniques of teaching.
5. Identification of training courses for the development of teaching, research and technical skills.
6. Prepare, distribute, collect and analyze the Quality and Devolvement questionnaires.

Academic Supervision Committee:

Its roles are:
1. Held on periodic supervision meeting.
2. Activate the role of the academic supervisor in directing the student for the future academic planning.
3. Prepare, distribute, collect and analyze the academic supervision questionnaires
4. Receiving and answering questions, suggestions and complaints of the students.
5. Awareness the students about the supporting services.

Graduates and Employment Commission:

Its roles are:
1. Collect and compile personal data and means of contact with students.
2. Collect and tabulate employer's data and means of contact.
3- Prepare, distribute, collect and analyze the graduates' questionnaires.
6. Activate ways of communication with the graduates.

Society Service Committee:

Its roles are:
1. collection and tabulation of programs and projects carried out by the teaching staff in this field.
2. Encouraging and developing the students initiative sight towards the society service.
3. Deepness the communication between the college and those who response of developmental plans in Saudi Arabia.
4. Develop practical programs to strengthen the relationship between the program and the local society and follow up their implementation.

Postgraduates and Scientific Research Committee:

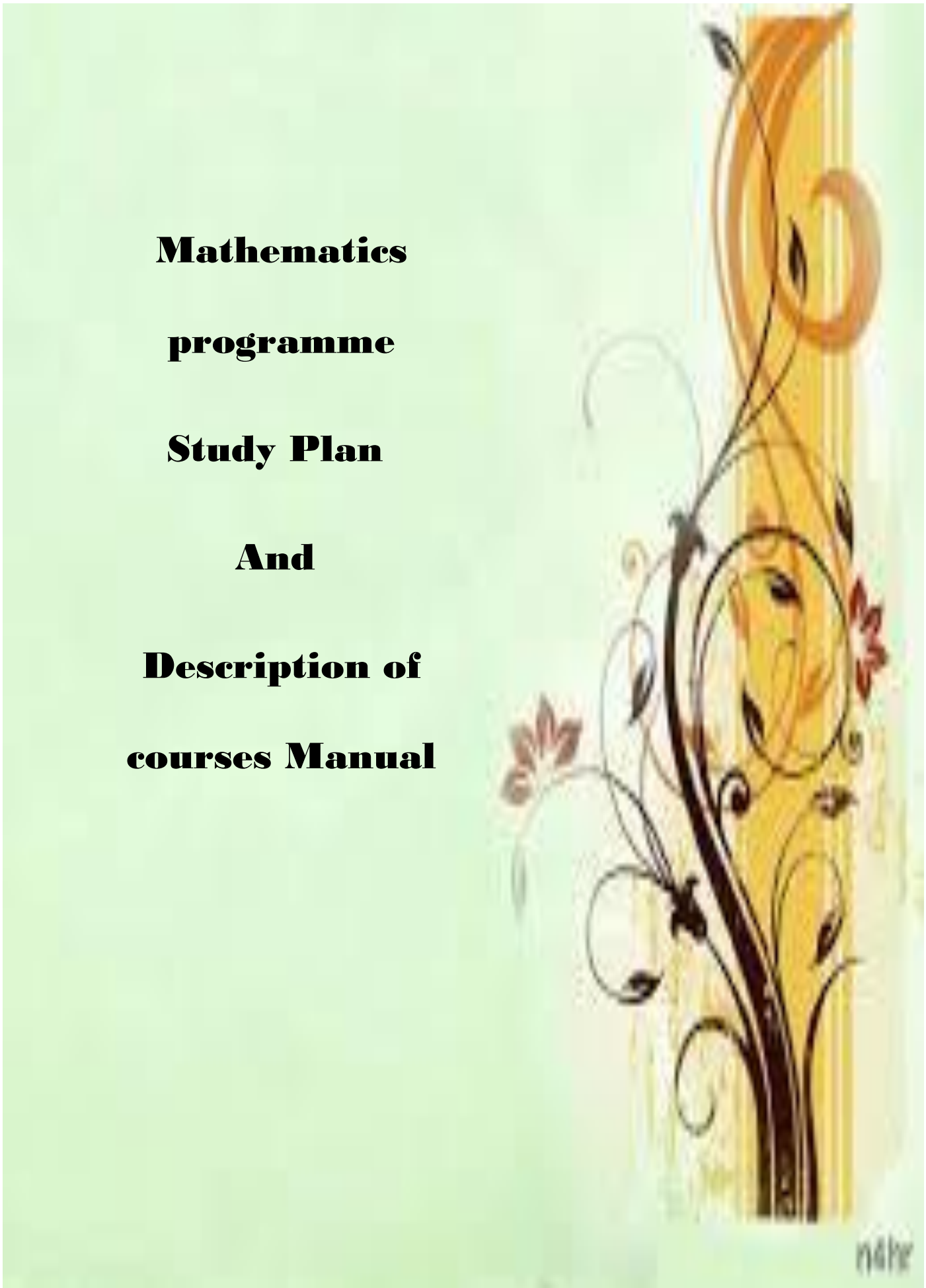
Its roles are:
1. Determination, documentation and publishing the academic research data .
2. Create and update research data base and published projects by teaching staff.
3. Urge teaching staff to scientific publishing in the international scientific journals (ISI).
4. Held a list of researches for teaching staff on the website of the programme and updated it annually.
6-Prepare the periodic report of the scientific research and held the suggestions and recommendations to the college.

Mathematics programme

Study Plan

And

Description of courses Manual



Mathematics department								
First level								
Course Number	Course Code	Course Name	Distribution modules				Number and code Prerequisite (Utilities)	Prerequisite name (Facilities)
			Theoretical	Practical	Tutorial (Exercises)	Total Credit hours		
*	*	University requirement	2	0	0	2		
*	*	University requirement	2	0	0	2		
*	*	University requirement	2	0	0	2		
111	MATH	Calculus (1)	1	0	2	2		
111	PHYS	General Physics (1)	1	2	0	2		
111	CHEM	General Chemistry (1)	1	2	0	2		
116	EDU	Teaching techniques and Communication skills	2	0	0	2		
117	EDU	Fundamentals of Islamic Education	2	0	0	2		
118	EDU	The System and Policy of Education in KSA	2	0	0	2		
Total						18 hours		
Second Level								
Course Number	Course Code	Course Name	Distribution modules				Number and code Prerequisite (Utilities)	Prerequisite name (Facilities)
			Theoretical	Practical	Tutorial (Exercises)	Total Credit hours		
*	*	University requirement	2	0	0	2		
121	MATH	Calculus (2)	3	0	2	4	MATH 111	Calculus (1)
122	MATH	The Foundations of mathematics	2	0	2	3		
124	MATH	Analytical Geometry (flat and stereoscopic)	3	0	2	4		
123	STAT	Principles of Statistics and Probability	2	0	2	3		
126	EDU	Developmental Psychology	2	0	0	2	EDU 116	
Total						18 hours		
Third level								

Course Number	Course Code	Course Name	Distribution modules				Number and code Prerequisite (Utilities)	Prerequisite name (Facilities)
			Theoretical	Practical	Tutorial (Exercises)	Total Credit hours		
*	*	University requirement	2	0	0	2		
212	Math	Calculus in several variables	3	0	2	4	Math 121	Calculus (2)
213	Math	Vector analysis	3	0	2	4	Math 212	Calculus (2)
214	Math	Linear algebra	3	0	2	4	Math 122	The foundations of mathematics
216	EDU	Psychological Health	2	0	0	2		
217	EDU	Principles of Educational Research	2	0	0	2	EDU 126	
Total						18 hours		
Fourth level								
Course Number	Course Code	Course Name	Distribution modules				Number and code Prerequisite (Utilities)	Prerequisite name (Facilities)
			Theoretical	Practical	Tutorial (Exercises)	Total Credit hours		
*	*	University requirement	2	0	0	2		
222	MATH	Number Theory	2	0	2	3	MATH 122	The Foundations of mathematics
224	MATH	Introduction to Differential Equations	3	0	2	4	MATH 212	Calculus in several variables
225	MATH	Statics	3	0	2	4	MATH 213	Vector analysis
223	STAT	Principles of the theory of probability distributions	2	0	2	3	STAT 123	Principles of Statistics and Probability
226	EDU	Educational Psychology	2	0	0	2		EDU 126
Total						18 hours		
Fifth level								
Course Number	Course Code	Course Name	Distribution modules				Number and code Prerequisite (Utilities)	Prerequisite name (Facilities)
			Theoretical	Practical	Tutorial (Exercises)	Total Credit hours		

311	MATH	Numerical Analysis	3	0	2	4	MATH 224	Introduction to Differential Equations
312	MATH	Real Analysis (1)	3	0	2	4	MATH 213	Calculus in several variables
313	Math	Mathematical Applications	3	0	2	4	MATH 213	Calculus in several variables
314	MATH	Mathematics Laboratory	1	0	2	2		
316	EDU	Management and planning of educational	2	0	0	2		
317	EDU	Production and electronic learning resources	2	0	0	2		
Total						18 hours		

Sixth Level								
Course Number	Course Code	Course Name	Distribution modules				Number and code Prerequisite (Utilities)	Prerequisite name (Facilities)
			Theoretical	Practical	Tutorial (Exercises)	Total Credit hours		
327	MATH	Mathematical Applications on the Computer	2	0	2	3	MATH 311	Numerical Analysis
322	MATH	Group Theory	2	0	2	3	MATH 222 + MATH 214	Number Theory + linear algebra
323	MATH	Introduction to Topology	3	0	2	4	MATH 312	Real Analysis (1)
324	MATH	Mathematical methods	3	0	2	4	MATH 224	Introduction to Differential Equations
321	EDU	Teaching strategies	2	0	2	2		Rapporteur of educational
322	EDU	studies programs	2	0	2	2		Rapporteur of educational
Total						18 hours		
Seventh Level								

Course Number	Course Code	Course Name	Distribution modules				Number and code Prerequisite (Utilities)	Prerequisite name (Facilities)
			Theoretical	Practical	Tutorial (Exercises)	Total Credit hours		
412	MATH	Real Analysis (2)	3	0	2	4	MATH 312	Real Analysis (1)
413	MATH	Complex Analysis	2	0	2	3	MATH 312	Real Analysis (1)
414	MATH	Rings and fields	2	0	2	3	MATH 322	Group Theory
415	MATH	Introduction to Partial Differential Equations	3	0	2	4	MATH 324	Mathematical methods
416	EDU	Modern trends in teaching strategies	2	0	0	2		EDU 326
417	EDU	Educational Evaluation	2	0	0	2		
Total						18 hours		

Eighth Level								
Course Number	Course Code	Course Name	Distribution modules				Number and code Prerequisite (Utilities)	Prerequisite name (Facilities)
			Theoretical	Practical	Tutorial (Exercises)	Total Credit hours		
421	MATH	Differential Geometry	3	0	2	4	MATH 224	Introduction to Differential Equations
425	MATH	Functional Analysis	2	0	2	3	MATH 323	Introduction to Topology
424	MATH	Project Research	2	0	0	2		Complete 108 credit hours of specialization
423	STAT	Introduction to statistical inference	2	0	2	3	STAT 223	Principles of the theory of probability distributions
428	EDU	Training course(MATH) Practicum	-	-	12	6		EDU 326 EDU 416
Total						18 hours		

Model (5)

Summary Course Description

Scheduled Information:

Module Information

Important Notes:

For credit hours:

Each 1 lecture hour = 1 credit hour

each 2 tutorial hours = 1 credit hour

Model (5)

Summary Course Description

Scheduled Information:

Module Information

Course Name	Calculus (1)
Course Number	111
Prerequisite name and number:	----
Course level:	1
Credits:	2 (1 lecture +2 tutorial)
:Module Title	Calculus (1)
:Module ID	MATH 111
:Prerequisite	---
:Level	1
:Credit Hours (lecture + tutorial)	2 (1 + 2)

Course description:

Module Description

	A general review on real numbers - inequalities - functions - functions and its inverse - definition of limits - continuity - Properties of functions defined on an interval- derivatives - Methods of Differentiation - critical points - the maximum values of the absolute - the local maximum values - the average value theory - increasing and decreasing - test of first Derivative – second derivative - concavity - critical points - drawing curves.

Objectives of the course:

Module Aims

1	**To improve the basic mathematical skills which are essential for all mathematical branches.**
2	**To improve the ability of mathematical thinking and analysising to solve problems .**
3	**To know the relationship between limits , Continuity and differentiation .**
4	**Knowledge of differentiation rules and its applications.**
5	**Develop the ability of sketching curves by using all information that have been studied**
6	**To improve the basic mathematical skills which are essential for all mathematical branches.**

Education Outcomes: (understanding, knowledge and skills and the mental process)

1	Definition and types of functions.
2	Understand limits and their relation with continuity.
3	Understand the concept of continuity and its relation with differentiation .
4	The ability of understanding differentiation and its rules – find the derivative of trigonometric functions and trigonometric inverse.
5	Use all concepts that have been studied to sketch curves - solve the application problems of maximum and minimum value .
6	Distinguish between mathematical concepts.
7	Contact her class mates.

Course Content:

Teaching hours (Hours)	Number of weeks (Weeks)	The list of topics (Subjects)
3	1	Real Numbers systems and inequalities .
3	1	Functions.
9	3	Limits.
9	3	Continuity.
9	3	Differentiation.
12	4	Applications of Differentiation.
45	15	Total

:Textbook and supporting References

Textbook title	The principles of calculus (1st Edition)
Author's Name	Kamal. E. Abdulrahman , Salih Elsanosi , Maaroof Samhan
Publisher	Nogom AlMaref Press
Publishing Year	1422
Reference (1)	Calculus with a practical application using Mathematica program
Author's Name	Huda Elkhurasani
Publisher	Dar Elzakhair
Publishing Year	2005\1426
Reference(2)	Calculus with analytic Geometry
Author's Name	Swokowski
Publisher	Olinick and Pence
Publishing Year	1994

(Model) 5

Summary Course Description

Module Information

Course Name	Calculus (2)
Course Number	MATH 121
Name and number Prerequisite:	MATH 111
Course level:	2
Credits:	4(theoretical 3 + exercises 2)
Module Title:	Calculus (2)
Module ID:	MATH 121
Prerequisite:	MATH 111
Level:	2
Credit Hours(Lecture + exercises):	4 (3 + 2)

Module Description

Course description:

The course contain the following topics:

.Definition of Definite Integral: Using Riemannian summation and its properties, The Mean Value Theorem in the integration, The main theorem in calculus, The original function, Definition of indefinite integral.

Integration of Transcendental Functions: Integration of trigonometric functions and their inverse, definition of Exponential, Logarithmic, Hyperbolic, Hyperbolic inverse functions. Integration of Exponential, Logarithmic, Hyperbolic, Hyperbolic inverse functions.

Indefinite Integral and its Integration Methods: Integration by substitution. Integration by parts, Integration of the trigonometric functions exponents, Integration by trigonometric substitution, Integration of quadratic forms, Integration by part fractions , another substitutions.
The Indeterminate Forms: Definition of the indeterminate forms, L' hospital rule – application in the Improper Integrals.
Applications of Integration: Find Areas, Rotated surfaces, Rotated volumes and lengths of curves.
Polar coordinates: Polar coordinates, Relationship between Polar and Cartesian coordinates, Curves in Polar coordinates, evaluating Areas using Polar coordinates.

Module Aims

Objectives of the course:

1	Knowledge of mathematical principles and concepts which are essential to all mathematical branches.
2	To know the importance of integration and its applications.
3	To know the concept of the indeterminate forms and their related topics.
4	Study the methods of finding integration and how to use the suitable one.
5	Study the methods of finding Areas in Polar coordinates .

(**Education Outcomes**: (**understanding**, **knowledge and skills and the mental process**

1	To know the concept of definite integration.
2	The ability of finding the integration of some transcendental functions.
3	Training students to the integration methods and how to select the suitable one .
4	Study the concept The Indeterminate Forms and their related basic concepts .
5	To know the applications of the indefinite integration.
6	The ability of finding Areas by using the Polar Coordinates.
7	Introduce a micro-teaching lesson for one topic related to the school.
8	Contact her class mates.

Course Content

(Hours)	(Weeks)	(Subjects)
10	2	**Definition of Definite Integral:** Using Riemannian summation and its properties, The Mean Value Theorem in the integration, The main theorem in calculus, The original function, Definition of indefinite integral.

15	3	**Integration of Transcendental Functions:** Integration of trigonometric functions and their inverse, definition of Exponential, Logarithmic, Hyperbolic, Hyperbolic inverse functions. Integration of Exponential, Logarithmic, Hyperbolic, Hyperbolic inverse functions.
20	4	**Indefinite Integral and its Integration Methods:** Integration by substitution, Integration by parts, Integration of the trigonometric functions exponents, Integration by trigonometric substitution, Integration of quadratic forms, Integration by part fractions , another substitutions.
10	2	**The Indeterminate Forms :** Definition of the indeterminate forms , L'ohbital rule – application in the Improper Integrals .
10	2	**Applications of Integration:** Find Areas, Rotated surfaces, Rotated volumes and lengths of curves.
10	2	**Polar coordinates:** Polar coordinates, Relationship between Polar and Cartesian coordinates, Curves in Polar coordinates, evaluating Areas using Polar coordinates.
75	15	Total

:Textbook and supporting References

Textbook title	Principles of calculus, 2nd edition
Author's Name	Kamal Hadi Abdul Rahman and others
Publisher	King Saud University
Publishing Year	-
Reference (1)	Calculus with Practical Application using Mathematica program
Author's Name	Huda Khorasani
Publisher	Dar Elzakhair
Publishing Year	1426/2005.
Reference (2)	Calculus with analytic Geometry
Author's Name	Swokowski
Publisher	Olinick and Pence
Publishing Year	1994

(Model) 5

Summary Course Description

Module Information

Scheduled Information:

Course Name	Analytical Geometry
Course Number	MATH 124

Name and number Prerequisite:	-
Course level:	2
Credits:	4 (3 theoretical +2 exercises)
Module Title:	Analytic Geometry
Module ID:	MATH 124
Prerequisite:	–
Level:	2
Credit Hours (Lecture + exercises):	4 (3 + 2)

Module Description

	The course covers the following topics: The general methods of determining a point in the space: Cartesian, cylindrical and Spherical coordinates. Line and plane in the space: Parametric equation, Cartesian equation, study of Cartesian equation of the plane. General equation of second degree: Analyzing the equation of second degree curves. Intersection of straight line of parametric representation with the second degree curves. Surfaces of second degree equations: cylinder, sphere, cone, paraboloid; their general equation and definitions.

Module Aims

Objectives of the course

1	To know the basic concepts like: Coordinates, straight line and plane equations.	
2	Develop the skills of identifying types of coordinates.	
3	Simplify the second degree curves equation.	
4	Know the surfaces of second degree equations	
5	Develop the ability to deal with problems related to analytic geometry.	

Education Outcomes: (**understanding**, **knowledge**, **skills and the mental process**)

1	.Memorize basic concepts of Analytic Geometry	
2	Induce the equations of the straight line and the plane in the space .	
3	Knowledge of how to simplify the general equation of the second degree.	
4	Induce the equations of some surfaces of the second degree equation .	
5	Introduce a micro-teaching lesson for one topic related to the school	
6	Solve oral questions and share discussion and dialogues at the class	

Course Content

(Hours)	(Weeks)	(Subjects)
20	**4**	The general methods of determining a point in the space.
20	**4**	Line and plane in the space.
20	**4**	General equation of second degree.
15	**3**	.Surfaces of second degree equations
75	15	Total

Textbook and supporting References

Textbook title	Analytic Geometry
Author's Name	Abdulla J. Elsoos and Anwar J. Elnajaar
Publisher	ElRosid Stationary
Publishing Year	1427
Reference (1)	Analytic Geometry for the first years in the University
Author's Name	Mohamed AbdulAti Maaty
Publisher	Al Rushed Library
Publishing Year	-
Reference(2)	The modern foundations of Analytic Geometry
Author's Name	Khader Hamid Elakhder
Publisher	Elresalaa Institution,
Publishing Year	1421

(Model) 5

Summary Course Description

Module Information

Scheduled Information:

Course Name	The foundations of mathematics
Course Number	MATH 122
Name and number Prerequisite:	-
Course level:	2
Credits:	3 (2 Lecture + 2 exercises)
Module Title:	Foundations of Mathematics
Module ID:	MATH 122
Prerequisite:	-
Level:	2
Credit Hours (Lecture + exercises):	3 (2 + 2)

Module Description

The course contain the following topics:
Principles of mathematical logic - Methods of proof - mathematical induction.
Sets - operations onsets.
Cartesian product on Sets - The binary relations – Partitioning of Sets - Equivalence classes.
Applications (functions) and the Equivalence Sets – Finite Sets - Countable Sets - The main numbers.
Homeomorphisms - Group: Definitions and examples - Rings and fields: Definitions and examples.
Polynomials - Partial fractions.

Module Aims

Objectives of the course

1	The ability to formulate mathematics sentences.	
2	Understand the principles of mathematical logic.	
3	The ability to understand methods of proof and choose the most appropriate one when solving mathematical problems.	
4	Knowledge of applications (functions) - their types and properties.	
5	Understand the basic concepts in algebra.	
6	Introduce a micro-teaching lesson for one topic related to the school	

Education Outcomes: (**understanding**, **knowledge**, **skills and the mental process**)

1	Knowledge of the principles of mathematical logic.	

2	Interested on understanding methods of mathematical proof and how to use them .	
3	Understand Sets and operations on them.	
4	Understand the concept (Relations) and study how to create and find them.	
5	Distinguish between the types of applications (functions).	
6	Understand the concept (the Main Number) and the equivalence Sets.	
7	Understanding the concepts (Homomorphism, Groups and Rings).	

Course Content

(Hours)	(Weeks)	(Subjects)
8	2	Principles of mathematical logic - Methods of proof - mathematical induction.
8	2	Sets - operations onsets .
12	3	Cartesian product on Sets - The binary relations – Partitioning of Sets - Equivalence classes.
12	3	Applications (functions) and the Equivalence Sets – Finite Sets - Countable Sets - The main numbers.
12	3	Homeomorphisms - Group: Definitions and examples - Rings and fields: Definitions and examples.
8	2	Polynomials - Partial fractions.
60	15	Total

:Textbook and supporting References

Textbook title	The foundations of mathematics, 2nd Edition
Author's Name	Maroof Samhan, Fadwa Abu Marifa
Publisher	Dar Khuraiji for Publishing and Distribution
Publishing Year	2006
Reference (1)	Discrete Mathematics
Author's Name	Maroof Samhan and Ahmed Shrari
Publisher	Al Khuraiji Prints
Publishing Year	2005
Reference (2)	Classical Abstract Algebra
Author's Name	R. A. Dean
Publisher	Harper and Row.Inc.
Publishing Year	1990

(Model) 5

Summary Course Description

Module Information

Scheduled Information:

Course Name	Principles of Statistics and Probability
Course Number	STAT 123
Name and number Prerequisite:	-
Course level:	2
Credits:	3 (2 theory + 2 exercises)
Module Title:	Principles of Statistics and Probability
Module ID:	STAT 123
Prerequisite:	-
Level:	2
Credit Hours(lecture + exercises):	3 (2 + 2)

Module Description

	Introduction to statistics: the definition of some statistical terminology and classification of data in the distribution frequency table and the most important ways to represent it graphically. Measures of central tendency (mean, median, mode) simple and classified data. Dispersion measures: (range, contrast, and standard deviation) Simple and classified data. The sample space and the traditional definition of the probability of an incident - axioms possibility. Conditional probability and the law of independency - the independence event - drawing tree - count procedures, permutations and combinations. Discrete random variable and distribution of probability - mathematical expectation and variance. Repetition of continuous variable curve (density function) - the cumulative distribution function. Binomial distribution law and Poisson Central Limit Theorem natural curve and spaces under the density curve - the standard normal distribution table - approximation to the binomial distribution of the normal distribution. Correlation between two variables: (Pearson coefficient, Spearman's rank correlation coefficient). And some sports programs in some parts as a program scheduled SPSS, EXCEL.

Module Aims

Objectives of the course

1	Identify the descriptive statistics and the basic concepts and principles.	
2	Knowledge of basic concepts of probability and probabilistic rules.	
3	Recognize the importance of statistics and its applications in various life issues.	
4	Using counting procedures, permutations and combinations.	
5	Identify some distributions.	
6	.The ability to use some mathematical software used in the development of this area	

Education Outcomes: (**understanding**, **knowledge**, **skills and the mental process**)

1	Accommodate the concept of descriptive statistics and basic principles.	
2	Organize data and know the most important ways to display and represent classification of Data.	
3	Knowledge of the basic concepts and rules in prospect.	
4	Recognize the count procedures, permutations and combinations.	
5	Proficiency in the use of probability distributions for some distributions tables.	
6	Recognize the relationship between correlation and regression.	
7	Application use some mathematical programs in some parts as a program scheduled EXCEL, SPSS.	
8	Introduce a micro-teaching lesson for one topic related to the school	

Course Content

(**Hours**)	(**Weeks**)	(**Subjects**)
8	2	Introduction to statistics: the definition of some statistical terminology and classification of data in the distribution frequency table and the most important ways to represent it graphically.
8	2	Measures of central tendency (average, median, vein) simple and classified data.
8	2	Measures of dispersion (range, contrast, and standard deviation) Simple and classified data.
4	1	The sample space and the traditional definition of the probability of an incident - axioms possibility.
8	2	Conditional probability and the law of the goats - the independence of accidents - drawing tree - count the ways and permutations and combinations.

4	1	Discrete random variable and distribution of probability - mathematical expectation and variance.
4	1	Repetition of continuous variable curve (density function) - the cumulative distribution function.
4	1	Binomial distribution - medium and variability law – Boison distribution and variability.
8	2	Central Limit Theorem - the natural curve and spaces under the density curve - standard normal distribution table - approximation to the binomial distribution of the normal distribution.
4	1	Correlation between two variables: Pearson coefficient, Spearman's rank correlation coefficient.
60	15	Total

:Textbook and supporting References

Textbook title	Introduction to Statistics
Author's Name	Mohamed Sobhi Abu Saleh
Publisher	Dar march for publishing, printing and distribution
Publishing Year	2007
Reference (1)	Principles of Statistics and solution possibilities with examples using Microsoft Excel
Author's Name	Adnan Majid Berri and d. Mahmoud Mohammed Hindi
Publisher	Shaqri, i library. 4
Publishing Year	1424
Reference (2)	Introductory Statistics
Author's Name	Perm S. Mann
Publisher	John wiley and sons, Inc
Publishing Year	2001

(Model) 5

Summary Course Description

Module Information

Scheduled Information:

Course Name	Calculus in several variables

Course Number	MATH 213
Name and number Prerequisite:	MATH 121
Course level:	3
Credits:	4 (3 lecture +2 exercises)
Module Title:	Calculus in Several Variables
Module ID:	MATH 213
Prerequisite:	MATH 121
Level:	3
Credit Hours (lecture + exercises):	4 (3 + 2)

Module Description

	Numerical Sequences and Series: Numerical Sequences – convergence and divergence Sequences – Limit of Sequences – Standard Cauchy convergence – infinite numerical series – convergence and divergence series – famous series – convergence tests – absolute convergence Power Series: convergence and divergence, representation of functions by power series –Taylor Series, McLaurin Series, and binomial Series. Partial derivation: Functions of several variables – limits and partial derivatives – chain rule – implicit differentiation – maximum and minimum values of functions in two variables – Lagrange factors. Multiple Integrals: double integral and its applications – double integral in polar coordinates – triple integral and its applications – triple integral in cylindrical and spherical coordinates – applications to find area and plane surfaces and volumes.

Module Aims

Objectives of the course

1	Studying sequences and series,	
2	Studying functions in several variables	
3	The ability to deductive logical development to solve problems.	
4	The distinction between mathematical concepts in the case of variable function or more.	
5	Understanding the concept of multiple integration and triple in polar coordinates, cylindrical and spherical coordinates.	

Education Outcomes: (**understanding**, **knowledge**, **skills and the mental process**)

1	Knowledge of the concept: infinite sequences and series.
2	The ability of representing functions by power series and Taylor - Maclaurin series.
3	Knowledge of the concept: limits and continuity of functions with two and three variables.
4	Distinguish between the differentiation of function with one variable and more.
5	Understand the concept: double and triple integrals in polar, cylindrical and spherical coordinates.

Course Content

(**Hours**)	(**Weeks**)	(**Subjects**)
20	4	Chapter 1: Numerical Sequences and Series
15	3	Chapter 2: Power Series
20	4	Chapter 3: Real Functions of Real Several Variables
20	4	Chapter 4: Multiple Integrals
75	**15**	

Reference	Calculus (Part III), 4th edition
Author's Name	Hassan benign and others
Publisher	King Saud University
Publishing Year	-
Reference (1)	Calculus, Sixth Edition
Author's Name	Swokowski, Olinick, and Pence
Publisher	John Wiley& Sons, New York
Publishing Year	1994
Reference (2)	Calculus & Analytical Geometry
Author's Name	H. Anton
Publisher	John Wiley & sons, New York,

Publishing Year	1992

(Model) 5

Summary Course Description

Module Information

Scheduled Information:

Course Name	Vector analysis
Course Number	MATH 212
Name and number Prerequisite:	MATH 121
Course level:	4 (3 lecture + 2 exercises)
Credits:	3
Module Title:	Vector Analysis
Module ID:	MATH 212
Prerequisite:	MATH 121
Level:	3
Credit Hours (lecture + exercises):	4 (3 + 2)

Module Description

	Basic concepts of vectors: Representation of vectors in double and triple space – .Vector algebra Vector Calculus: normal derivatives of vectors – curves in space – limits, continuity and portability calculus – calculus formula – partial differentiation – .Vector Calculus – geometry of differentiations.

	Directional functions: definition of vector – functions differentiation and integration – differential factor – include the convergence and divergence of .function (grad, div, curl) – formulas involved consistency. The ribs curve coordinates: transformation of coordinates – the ribs curve orthogonal coordinates – and the unit vector in the ribs curve – systems arc length and volume elements – slope and spacing and turn around and influential Laplace – coordinates special orthogonal systems (cylindrical coordinates – .spherical coordinates) Integration and theories of integration: integration of the curve – integrals on a curve in terms of the vector – properties of curve integration – closed curves – Green theory in the plane – the independence of curve trace – the integration on the surface – Gaussian theory – Stokes theorem.

Module Aims

1	have the ability to deal with vectors and their differentiation	
2	The development of student skills in how to use vectors in a straight line and plane equation.	
3	Know the generalized coordinates specially cylindrical and spherical	
4	Understand and accommodate different types of integrations, such as linear and surface, and to study the theories of integration, and training students on how to apply.	

Education Outcomes: (**understanding**, **knowledge**, **skills and the mental process**)

1	Acquire the ability to deal with vectors and distinguish between scalar quantities and vectors.	
2	The ability of student of how to use vectors in finding the equation of the straight line and plane.	
3	Knowledge of the generalized coordinates and as a special case cylindrical and spherical.	
4	Understand and accommodate different types of integrations such as linear and surface studying the integration theorems and training the student in how to use them.	
5	**Account the various integration and understanding of the theories of integration and how they are applied and used to calculate the various integration.**	
6	Solve more tutorials to be familiar with vector differentiation and integration methods	

Course Content

(**Hours**)	(**Weeks**)	(**Subjects**)
15	3	Basic Concepts of Vectors - Find the Equations of a Straight line and a Plane by many ways.
15	3	Vectors differentiation

10	2	Directional functions
10	2	Coordinates of the curved sides
25	5	Integration and the Theories of Integrations:
75	15	Total

Textbook and supporting References

Textbook title	سلسلة ملخصات شوم: نظريات ومسائل في تحليل المتجهات ومقدمة لتحليل الكميات الممتدة
Author's Name	د.موراى ر.شبيجل، ترجمة د. سميرة عبد الحفيظ رستم
Publisher	الدار الدولية للنشر والتوزيع – القاهرة – مصر (الطبعة العربية الخامسة)
Publishing Year	1999م
Reference (1)	Schaum's Outline Series: Theories and Problems in Vector Analysis and an Introduction to the Analysis of Tensors, The Arabic 5 th Edition,
Author's Name	Murray R. Spiegel
Publisher	McGraw-Hill International Book Company
Publishing Year	1999
Reference (2)	Schaum's Outline Series: Theories and Problems of Advanced Mathematics for Engineers and Scientists
Author's Name	Murray R. Spiegel
Publisher	Dar Al Arabi
Publishing Year	1984.
Reference (3)	Calculus, Sixth Edition
Author's Name	Swokowski, Olinick, and Pence
Publisher	John Wiley & Sons, New York
Publishing Year	1994

(Model) 5

Summary Course Description

Module Information

Scheduled Information:

Course Name	Linear Algebra
Course Number	MATH 214
Name and number Prerequisite:	MATH 122
Course level:	3
Credits:	4 (3 lecture +2 exercises)

Module Title:	Linear Algebra
Module ID:	MATH 214
Prerequisite:	MATH 122
Level:	3
Credit Hours (lecture + exercises):	4 (3 + 2)

Module Description

	Matrices: operations on them - types of matrices - transformations classes Determinants: Some simple ways to calculate properties of determinants - inverse matrix – rank of a matrix. Linear equations homogeneous and non- homogeneous systems and methods to solve: how Gauss – Gauis-Gordan – Kramer rule. Vector spaces: subspace - linear combinations of Independence and the linear correlation - the foundation and the dimension of the space – matrix rank - a matrix transfer basis - coordinates and change the bases - the direct combination of the sub-spaces. Linear transformations: the kernel and the image of the linear conversion and dimension theorem - linear transformations structure and their properties - the concept of symmetry between the vector spaces - linear and linear impressive conversion matrix. Inner product: the internal space of the beating - length of orthogonal vector - the angle between orthogonal bases and complementary vertical and vertical projection. Eigen values and Eigen vectors: their properties - how to calculate the Eigen values and Eigen vectors - square matrix - viability of the matrix of the distillation - Eigen values and Eigen vectors for linear transformations and how to calculate it.

Module Aims

Objectives of the course

1	Knowledge of the basic concepts of matrices.	
2	The ability to apply and develop all algebraic concepts under study.	
3	Ability to formulate algebraic expressions and substantiated.	
4	The ability to use the concepts of this course in resolving many issues of life development.	

Education Outcomes: (**understanding**, **knowledge**, **skills and the mental process**)

1	The use of matrices and determinants in solving systems of linear equations.
2	Study beaten Vector resolve issues it.
3	The study of the internal battery and the application it.
4	Accommodate the concept of linear transformations and solving applications on them.
5	Understand the eigenvalues and distinctive vector solving the issues.
6	Introduce a micro-teaching lesson for one topic related to the school

Course Content

(**Hours**)	(**Weeks**)	(**Subjects**)
10	2	Matrices: and operations on them - the types of matrices - Initial transfers classroom - the matrix in the form of classroom Featured (DRI).
10	2	Determinants: Some simple ways to calculate properties of selectors - inverse matrix - rank.
10	2	Linear equations homogeneous and heterogeneous systems and methods to solve: how Gauss - Jaos_jordan -kramer.
15	3	Vector spaces: subspace - linear fixtures - Independence linear correlation - the foundation and the dimension of the vacuum - rank matrix - basically transfer - coordinates and change the foundation - the direct combination of the partial spaces.
10	2	Linear transformations: the kernel and the image of the linear conversion and dimension theorem then provide linear transformations structure and their properties - the concept of symmetry between the vector spaces - linear and linear impressive conversion matrix.
10	2	Inner product: the internal space of the beating - and the length of orthogonal vector - the angle between the heading and foundations titer orthogonal and complementary vertical and vertical projection.
10	2	Characteristic values and vectors and their properties: how to calculate the characteristic values and vectors square matrix and discuss the viability of the matrix of the distillation - and finally to identify the characteristic values and vectors for moving linear and how to calculate it.
75	**15**	Total

:Textbook and supporting References

Textbook title	Linear Algebra and its Applications - Second Edition
Author's Name	Maaroof Samhan, Ali Asheibani and Fawzi Alzukair
Publisher	Obeikan Publishing
Publishing Year	-
Reference (1)	Linear Algebra simplified (interpreter)
Author's Name	Howard Anton
Publisher	John Wiley & Sons, second edition
Publishing Year	1982
Reference (2)	Finite Dimensional Vector Spaces
Author's Name	Paul Thomson
Publisher	Springer Verlag
Publishing Year	-

(Model) 5

Summary Course Description

Module Information

Scheduled Information:

Course Name	Statics
Course Number	MATH 225
Name and number Prerequisite:	MATH 212
Course level:	4
Credits:	4 (3 lecture +2 exercises)
Module Title:	Statics
Module ID:	MATH 225
Prerequisite:	MATH 212
Level:	4
Credit Hours (lecture + exercises):	4 (3 + 2)

Module Description

	The course contain the following topics:

	Definition of vectors – scalar product and vector product - applications on vectors: use of vectors in solving some of the plane geometry issues. Principles of statics - the resulted force of the connected and disconnected forces - applications. Plane Forces: the force of determination on the point about an axis - the outcome of a set of joint forces in points (graphically and analytically) and Study the equilibrium of some bodies and the joints with friction and without it. Center of gravity.

Module Aims

Objectives of the course

1	Use the concepts of vectors and operations on them and apply them to forces as one of the types of vectors.	
2	Analyze the study and installation of force and poise terms of a rigid body or group of objects with flat identify the centers of gravity of the bodies of the dominant processes.	
3	Understanding of the principles of statics, including a parallelogram rule and Lamy rule.	
4	Develop the student's ability on how to collect a set of planar forces and steric convergent and non convergent.	
5	the student be familiar to the concept of the center of gravity and calculated using integration by taking some examples.	

Education Outcomes: (**understanding**, **knowledge**, **skills and the mental process**)

1	ability to use vectors in solving some of the plane geometry issues.	
2	It enables the student to study the analysis and installation of force's operations, the terms of rigid body or group of flat objects, with the identification of centers of gravity of objects.	
3	understanding of the concept of equilibrium and how to resolve some of problems.	
4	Application of the concept and the laws of center of gravity to find the weight of some of the objects and curves and space center.	

Course Content

(**Hours**)	(**Weeks**)	(**Subjects**)
10	2	Applications on Vector.
15	3	Planar forces.
15	3	Poise ideal mechanical systems.

15	3	Poise real mechanical systems (friction).
10	2	Introduction poise steric forces (screw) definition.
10	2	Blocs center (center of gravity).
75	**15**	Total

:Textbook and supporting References

General mechanics (1) statics	Textbook title
Fuad Zain Arabs	Author's Name
Dar university salary, Beirut, Lebanon.	Publisher
-	Publishing Year
Mechanics for Engineers (1) statics	Reference (1)
Farooq Ahmed wire	Author's Name
Dar university salary, Beirut, Lebanon	Publisher
-	Publishing Year
Statics	Reference (2)
Amjad Ibrahim Shahatha	Author's Name
Dawn House Publishing and Distribution	Publisher
2000	Publishing Year
Basics of Statics	Reference (3)
Dr.. Adel Taha Younis	Author's Name
Rushd Library	Publisher
1428/2007	Publishing Year
Statics	Reference (4)
J.L Merriam	Author's Name
John Wiley and Sons, Inc.	Publisher
1959	Publishing Year

(Model 5)

Summary Course Description

Module Information

Scheduled Information:

Course Name	Introduction to Ordinary Differential Equations

Course Number	MATH 224
Name and number Prerequisite:	MATH 213
Course level:	4
Credits:	4 (3 lecture +2 exercises)
Module Title:	Introduction to Ordinary Differential Equations
Module ID:	MATH 224
Prerequisite:	MATH 213
Level:	4
Credit Hours (lecture + exercises):	4 (3 + 2)

Module Description

	Definition of differential equations: (classified - and composition). Methods of solving differential equations of the first order: Methods of solving differential equations of the first order and first class: separation of variables - homogeneous equations - the full differential equations - equations reduced to complete using the integration factor - linear equations - rates reduced to linear (Bernoulli's equation and Recartti) - applications on differential equations (orthogonal tracks). Differential equations of the first order and higher degree: Methods of solution of linear higher orders differential equations: With constant coefficients: the general solution of the homogeneous equation and solving the equation using heterogeneous effective - way to change the parameters. Variable transactions: the Euler- Cauchy equation - solving equations manner influential analysis. Systems with constant coefficients of linear differential equations of the first order: homogeneous and non homogeneous equation. Laplace transformations: and their use in solving differential equations initial conditions.

Module Aims

Objectives of the course

1	define the differential equation.	
2	distinguish between the methods of solving differential equations of the first order.	

3	Skill development on how to solve linear higher-order differential equations.	
4	solve systems of linear differential equations with constant coefficients.	
5	solving differential equations using Laplace transformation.	

Education Outcomes: (**understanding**, **knowledge**, **skills and the mental process**)

1	Knowledge of different ways to solve differential equations of the first order and first degree.	
2	Understand the ways of solving linear equations homogeneous and non homogeneous higher-order constant and variable factors.	
3	Distinguish between methods of solution of linear differential equations homogeneous and non homogeneous equations systems.	
4	Using the method of Laplace transformation to solve differential equations.	

Course Content

(**Hours**)	(**Weeks**)	(**Subjects**)
10	2	Definition of differential equations
20	4	Methods of solving differential equations of the first order
20	4	Methods of solution of linear higher-order Differential Equations
15	3	Linear systems of differential equations
10	2	Laplace transformation
75	**15**	Total

:Textbook and supporting References

Textbook title	المعادلات التفاضلية (الجزء الأول – الجزء الثاني)
Author's Name	Hassan Alaweida and others
Publisher	Rushed Library
Publishing Year	1427/2006
Reference (1)	differential equations
Author's Name	Ayers francs
Publisher	**Dar Makjroheel Publishing**
Publishing Year	1976
Reference (2)	Advanced Mathematics for Engineers (Part II)

Author's Name	Abdel Muti al-Badawi
Publisher	Dar university salary
Publishing Year	1421
Reference (3)	Elementary Differential Equations
Author's Name	Earl. D.Rainvillem and Philip E.Bedient
Publisher	8th edition
Publishing Year	1974

(Model) 5

Summary Course Description

Module Information

Scheduled Information:

Course Name	Number Theory
Course Number	MATH 222
Name and number Prerequisite:	MATH 122
Course level:	4
Credits:	3 (2 lecture + 2 exercises)
Module Title:	Number Theory
Module ID:	MATH 222
Prerequisite:	MATH 122
Level:	4
Credit Hours (lecture + exercises):	3 (2 + 2)

Module Description

	The first principle and the second extrapolation of mathematics - the principle arrangement Hassan – division portability - Euclidean algorithm - primes and some properties - bijectives and their properties - linear bijectives – remainder Chinese theory - matches the non-linear solutions - Fermat's Little Theorem – Euler theorem - theorem and age - some numerical functions - Pythagorean triples - some cases of Fermat's last theorem - Simplified continued fractions.

Module Aims

Objectives of the course

1	Use the principles of mathematical induction to proof mathematical expressions.	
2	Using scalability division and Euclidean algorithm to resolve the problems.	
3	Matching definition linear and non-linear bijectives and resolve problems on them.	
4	Use the Pythagorean theorem to solve problems.	
5	Give examples of continuous fractions simplified.	

Education Outcomes: (**understanding**, **knowledge**, **skills and the mental process**)

1	Learn some mathematical principles.	
2	use the principles of mathematical induction to proof mathematical expressions.	
3	solve linear and non-linear bijectives.	
4	Giving students the skills to deal with the numbers.	
5	Giving students the knowledge of new relationships between numbers.	
6	Giving students the ability to communicate to stimulate mathematical thinking, understand and solve mathematical problems.	

Course Content

(**Hours**)	(**Weeks**)	(**Subjects**)
12	3	The first principle and the second extrapolation in math - the principle arrangement Hassan.
12	3	Scalability division - Euclidean algorithm - primes and some of their properties.
12	3	linear equations - bijectives and their properties - bijectives linear theory - the rest of Sino matches nonlinear solutions.
8	2	Fermat's Little Theorem - Euler's theorem - theorem and age.
8	2	Some numerical functions - Pythagorean triples.
8	2	Some cases of Fermat's last theorem - Simplified fractures.
60	**15**	Total

الكتاب المقرر والمراجع المساندة:

Textbook title	Introduction to number theory and its applications
Author's Name	Fawzi Thukair and Samhan unknown

Publisher	Dar al Khuraiji distribution and publishing
Publishing Year	1431
Reference (1)	Introduction to Number Theory
Author's Name	Prof. Hassan Mustafa Alaweida
Publisher	Rushd Library
Publishing Year	1429
Reference (2)	Elementary Number theory
Author's Name	D. Burton
Publisher	Allyn and Bacon , Inc
Publishing Year	1980

(Model) 5

Summary Course Description

Module Information

Scheduled Information:

Course Name	Principles of probability distributions theory
Course Number	STAT 223
Name and number Prerequisite:	STAT 123
Course level:	4
Credits:	3 (2 lecture + 2 exercises)
Module Title:	Principles of Probability Distributions Theory
Module ID:	STAT 223
Prerequisite:	STAT 123
Level:	4
Credit Hours (lecture + exercises):	3 (2 + 2)

Module Description

	Discrete Probability: probability mass function and their properties - mathematical expectation and variance, standard deviation, moment generating functions of discrete distributions.

	Continuous probability distributions: probability density function and their properties - mathematical expectation and variance, standard deviation, moment generating functions of the distributions related. Dividend small sampling includes: chi-squared distribution - the distribution of the sum of squares and the distribution of a sample taken from a normal distribution of variability - the distribution or the Student t-distribution and its applications - distribution and its application to infer the distribution ratio Differential two independent samples of natural distribution. Bilateral discrete random variables and their related properties: the expectation of a random variable dual-covariance (covariance) - the correlation coefficient of the random variable duo - the contrast of the total or the difference between two variables - generating functions of the moments of the random variable duo - mixed chipyshif. Distributions of two variables: the marginal distributions and conditional joint - the independence of random variables - conditional expectation.

Module Aims

Objectives of the course

1	distingue between the generating functions of the moments of the distributions and discrete probability.	
2	Accommodate binary random discrete variables related to the most important properties.	
3	Identify the variables distributions.	
4	distinguish between types of random samples.	
5	use some mathematical software used in the development of this area.	

Education Outcomes: (**understanding**, **knowledge**, **skills and the mental process**)

1	separate between the generating functions of the moments of the distributions and related discrete.	
2	Knowledge of the characteristics of discrete and continuous random variables.	
3	Understand the concept of dividend distributions and bivariate functions.	
4	Knowledge of the types of random samples and some related concepts exponential.	
5	Application use some mathematical programs in some parts as a program scheduled EXCEL, SPSS.	

Course Content

(Hours)	(Weeks)	(Subjects)
8	2	Discrete Probability: probability mass function and their properties - mathematical expectation and variance, standard deviation, moment generating functions of discrete distributions.
8	2	Continuous probability distributions: probability density function and their properties - mathematical expectation and variance, standard deviation, moment generating functions of the distributions related.
12	3	Dividend small sampling includes: chi-squared distribution - the distribution of the sum of squares and the distribution of a sample taken from a normal distribution of variability - the distribution or the distribution of Student and its applications - distribution and its application to infer the distribution ratio Differential two independent samples of natural distribution.
20	5	Bilateral discrete random variables and their properties related to: the expectation of a random variable duo - covariance (covariance) - the correlation coefficient of the random variable duo - the contrast of the total or the difference between two variables - generating functions of the moments of the random variable.
12	3	Distributions of two variables: the marginal distributions and conditional joint - the independence of variables- conditional expectation.
60	**15**	Total

:Textbook and supporting References

Textbook title	probability theory
Author's Name	DJalal fisherman
Publisher	Dar Hafez Publishing
Publishing Year	1429
Reference (1)	Theories and applications in basic possibilities and probability distributions
Author's Name	Amin Ibrahim Adam
Publisher	King Fahd National Library

Publishing Year	-
Reference (2)	Statistics and Probability
Author's Name	Anis Ismail Kangoo
Publisher	Obeikan Library
Publishing Year	2000
Reference (3)	An Introduction to Probability and its Applications
Author's Name	Larson, Marx
Publisher	Prentice Hall
Publishing Year	1985

(Model) 5

Summary Course Description

Module Information

Scheduled Information:

Course Name	Mathematical Applications
Course Number	MATH 313
Prerequisite name and number:	MATH 224
Course level:	5
Credits:	4 (3 lecture +2 tutorials)
Module Title:	Mathematical Applications
Module ID:	MATH 313
Prerequisite:	MATH 224
Level:	5
Credit Hours(lecture + tutorial):	4 (3 + 2)

Module Description:

Chapter 1: Kinematic (basic principles of movements)
Chapter 2 :movement of a particle in a straight line
Chapter 3 : **movement of a particle in** a plane Part 1 : **movement of a physical point in** a plane using Cartesian coordinates Part 1 : **movement of a particle in** a plane using Polar

coordinates Part 1 : Centripetal forces
Chapter 4 : the plane movement of the (Rigid body) Part 1 : the concept of moment of inertia of the rigid body Part 1 : movement of the rigid body in a plane under the influence of a specific force

Module Aims

Objectives of the course

1	Knowledge of basic concepts of applied mathematics and understanding of Newton laws for movement and their applications	
2	Induce the equations of an article in a plane and how to applied it to the projectiles movement	
3	Develop the ability of using the concept of moving on a circle and know the concept of central movement by using suitable coordinates	
4	Definition of moment of inertia for some bodies .	
5	The ability of understanding types of movements for the rigid body description and analysis of the difference between the rotated movement for different bodies .	

Education Outcomes: (**understanding**, **knowledge**, **skills and the mental process**)

1	apply Newton laws for movement on a movement of a particle in a straight line and the movement of a particle in a plane , distinguish between movement in 1-dimension and 2- dimensions .
2	Study of Projectiles movement and their application in the life
3	Distinguish between types of movements which use Cartesian coordinates or Polar coordinates , Distinguish between the movement of a particle in a straight line and in a circle .
4	Knowledge of the moment of inertia and calculating it for some special bodies and other bodies
5	Understanding types of movements for the rigid body and the application of different types of circular Movement of the body in some problems
6	Distinguish between mathematical concepts.
7	Induce suitable mathematical equations for the studied statement.
8	Contact her class mates to solve tutorials in a team work.

Course Content

(Hours)	(Weeks)	(Subjects)
15	3	Chapter 1: Kinematic (basic principles of movements)
15	3	Chapter 2 :movement of a particle in a straight line
25	5	Chapter 3 : **movement of a particle in** a plane Part 1 : **movement of a physical point in** a plane using Cartesian coordinates Part 1 : **movement of a particle in** a plane using Polar coordinates Part 1 : Centripetal traces
20	4	Chapter 4 : the plane movement of the (Rigid body) Part 1 : the concept of moment of inertia of the rigid body Part 1 : movement of the rigid body in a plane under the influence of a specific force
75	**15**	

:Textbook and supporting References

- Fundamentals of Dynamics science , Adil Taha Yonis , Al Roshid stationary ,1427/2005 .
- Principles of Dynamics , Mohammed Hilmi Mahran AL Adawi, Al Roshid stationary, 1428/2007 .
- Schoum sereis : series and problems in general mechanics and its application , Moray.R .Spigil , Mc-Graw hill. INC ,1967 .
- The Elements of Static and Dynamic, S. L. Loney, CAMBRIDGE AT THE UNIVERSITY PRESS, Internet Archive, 1932.

List Electronic Materials :

- www.Maktabat.mu.edu.sa

(Model) 5

Summary Course Description

Module Information

Scheduled Information:

Course Name	Numerical Analysis
Course Number	MATH 311
Name and number Prerequisite:	MATH 214
Course level:	5
Credits:	4 (3 lecture +2 exercises)
Module Title:	Numerical Analysis
Module ID:	MATH 311
Prerequisite:	MATH 214
Level:	5
Credit Hours(lecture + exercises):	4 (3 + 2)

Module Description

	Error types and methods of appreciating and calculating it. Numerical methods of solving nonlinear equations: Road graphs - repeated bisection method - and Newton (Newton - rafsson) - static mode - cutouts (tendons) - successive approximations - study and analysis of errors related to these methods and discuss the convergence rates. Solving systems of linear equations using: Direct methods (deletion of the Gauss - Analysis LU) - indirect methods (Jacobi and Gauss -sidal) - Determination of errors related to these methods - the conclusion matrices repeatability and discuss the convergence of iterative methods. Interpolation and approximation by polynomials: Lagrange - Newton's divided differences and the front and rear with analysis of the resulting errors in every way. Numerical methods for calculus: numerical methods for calculus - discuss the accuracy and estimation errors - numerical methods for calculating discuss integration with estimation accuracy and estimation errors in each method (trapezoidal way -Simpson - quadratic Gaussian). Solving differential equations of the first order numerically.

Module Aims

Objectives of the course

1	Knowledge of error types and methods of their account.	
2	solve the nonlinear equations numerically by different ways.	
3	Giving students the skill of interpolation and approximation polynomials.	
4	The ability to use numerical methods for calculus.	
5	Absorb the importance of resorting to the use of some numerical methods to find some integrals values and estimate the error rate.	

مخرجات التعليم: (الفهم والمعرفة والمهارات الذهنية والعملية)

1	Apply ways to solve non-linear equations, study and analysis errors related to these methods and discuss the convergence rates.	
2	Accommodating ways to solve linear equations using direct methods and systems estimation errors related to these methods infer arrays repeatability.	
3	Find interpolation and approximation by polynomials with errors resulting analysis.	
4	Study of numerical methods for calculus with a discussion of estimation accuracy and estimation errors.	
5	Search solutions of differential equations of the first order numerically.	

Course Content

(Hours)	(Weeks)	(Subjects)
5	1	Error types and methods of appreciation and calculated.
10	2	Numerical methods of solving nonlinear equations: Road graphs - repeated bisection method - and Newton (Newton - rafsson) - static mode - cutouts (tendons) - successive approximations - study and analysis of errors related to these methods and discuss the convergence rates.
20	4	Solving systems of linear equations using: Direct methods (deletion of the Gauss - Analysis LU) - indirect methods (Jacobi and Jaos_sidal) - Determination of errors related to these methods - the conclusion matrices repeatability and discuss the convergence of iterative methods.
15	3	Interpolation and approximation by polynomials: Lagrange - Newton's divided differences and the front and rear with analysis of the resulting errors in every way.
15	3	Numerical methods for calculus: numerical methods for calculus - discuss the accuracy and estimation errors - numerical methods for calculating discuss integration with estimation accuracy and estimation errors in each method

		(Trapezoidal polygon - Simpson's way - quadratic Gaussian).
10	2	Solving differential equations of the first order numerically.
75	**15**	Total

:Textbook and supporting References

Textbook title	Numerical Analysis
Author's Name	Abu Bakr Ahmad
Publisher	Dar pen
Publishing Year	1409
Reference (1)	Numerical Analysis
Author's Name	Nasser Abdel Kader Solar
Publisher	Rushed Library
Publishing Year	2007
Reference (2)	Numerical Analysis
Author's Name	Mahmoud Abou El Ezz , Mohammed Salah Uddin, Metwally and Fathi Abdel-Salam
Publisher	Rushed Library
Publishing Year	1427
Reference (3)	Numerical Analysis
Author's Name	R.L. Burden and J.D.Faires
Publisher	Brooks Cole Co. - 6th Edition
Publishing Year	2000

(Model) 5

Summary Course Description

Module Information

Scheduled Information:

Course Name	Mathematics Laboratory
Course Number	MATH314
Name and number Prerequisite:	-
Course level:	5
Credits:	2 (1 lecture +2 practical)
Module Title:	Mathematics Lab
Module ID:	MATH314
Prerequisite:	-

Level:	5
Credit Hours(lecture + exercises):	2 (1 + 2)

Module Description

	Introduction to Mathematica. Use Mathematica program: in solving algebraic equations Statistics - second-degree equations - polynomial - matrices - complex numbers - totals and outcomes beatings - limits and calculus - drawing of lines and curves in the bilateral dimension - drawing curves in the triple dimension. use of scientific research and learn how to write reports using Scientific Program Work Place. Writing projects using latex program.

Module Aims

Objectives of the course

1	Definition of the importance of certain sports programs and applications.
2	Development skill to use some Mathematical programs in many branches of mathematics and its applications.
3	The development of student skills in using Mathematica and applications software.
4	The development of student skills in ways to use the Internet for scientific research and the basics of writing reports and scientific research and projects.
5	Give an overview of work place program (Scientific Work Place) and learn presentation skills and writing reports.
6	Give an overview of Latex editing program and learn presentation skills and report writing projects.

Education Outcomes: (**understanding**, **knowledge**, **skills and the mental process**)

1	Being able to use some of the mathematical programs in many branches of mathematics and its applications.	
2	The ability to use scientific research skills, diction and application.	
3	using mathematical work place Editor programs (Scientific Work Place).	
4	mathematical silk of using Latex editor.	
5	The ability to deliver text as Power Point presentations.	

Course Content

(Hours)	(Weeks)	(Subjects)
3	1	Introduction to Mathematica.
18	6	Use Mathematica program: in solving simple algebraic equations - the equations of the second degree - polynomial - matrices - totals and outcomes beatings - limits and calculus - drawing of lines and curves in the bilateral dimension - drawing curves in the triple dimension.
6	2	search an internet procedure for writing math research using Scientific Program (Scientific Work Place).
18	6	Writing projects using latex program.
45	**15**	Total

:Textbook and supporting References

Textbook title	Essential PTC Mat lap
Author's Name	Brent Maxfield, P.E.
Publisher	Elsevier Inc
Publishing Year	2014
Reference (1)	Essential Mat lap for Engineering, Science and Math
Author's Name	Brent Max field, P.E.
Publisher	Elsevier Inc
Publishing Year	2009
Reference (2)	More Math Into LaTeX: A Guide for Documentation and Presentation
Author's Name	G.Gratzer
Publisher	Springer
Publishing Year	2007

(Model) 5

Summary Course Description

Module Information

Scheduled Information:

Course Name	(1) Real Analysis
Course Number	MATH 312
Name and number Prerequisite:	MATH 213
Course level:	5
Credits:	4 (3 lecture +2 exercises)
Module Title:	Real Analysis (1)
Module ID:	MATH 312
Prerequisite:	MATH 213
Level:	5
Credit Hours(lecture + exercises):	4 (3 + 2)

Module Description

	The real numbers: natural numbers and the correct relative arrangement and cosine Muslim groups and the innumerable. Sequences and Convergence: convergent sequences and sequences steady, Bulzano-Weirstras theory and standard Cauchy, partial sequences, the basic properties of real numbers Topologia. Continuity: end of the function, function steady, function and properties related to Continuity, regular Continuity, compact and Continuity groups. Differentiation: derivative of a function and properties of real derivation, mean value theorem, L'Hospital's rule, the theory of Taylor.

Module Aims

Objectives of the course

1	Gain the ability to understand the basic properties of the field of real numbers related axioms and cosine.	
2	dealing with sequences and sequences convergence and divergence.	

3	understand the theory and Bulzano-firaction, standard Cauchy sequences and partial open and closed and basic properties of the real Topological groups.	
4	Training students on the study limits and continuous functions and properties and regular continuity, and groups of compact, communication, and the derivation and properties.	
5	Know the importance of the mean value theorem and the theory and the theory of L'Hospital's and Taylor.	

Education Outcomes: (**understanding**, **knowledge**, **skills and the mental process**)

1	Understand the basic properties of the field of real numbers.	
2	Understand the most important theories field of real numbers.	
3	The ability to find function limits .	
4	Continuity properties and regular Continuity.	
5	Ends of functions and compact groups, Continuity, derivative and properties.	

Course Content

(**Hours**)	(**Weeks**)	(**Subjects**)
10	2	Real numbers
25	5	Sequences and convergence
20	4	Continuity
20	4	Differentiation
75	**15**	Total

:Textbook and supporting References

Textbook title	Principles of Real Analysis (Part I)
Author's Name	Mohammed Gwaiz and Saleh al-Sanusi
Publisher	King Saud Press
Publishing Year	2002
Reference (1)	Principles of Real Analysis
Author's Name	Mahmoud Mohammed Kutkut
Publisher	Dar Mars Publishing
Publishing Year	1410
Reference (2)	Introduction to Real Analysis
Author's Name	R. Bartle and D.Sherbert

Publisher	John-Wiley & Sons, New York
Publishing Year	2000

(Model) 5

Summary Course Description

Module Information

Scheduled Information:

Course Name	Mathematical methods
Course Number	MATH 324
Name and number Prerequisite:	MATH 224
Course level:	6
Credits:	4 (3 lecture +2 exercises)
Module Title:	Mathematical Methods
Module ID:	MATH 324
Prerequisite:	MATH 224
Level:	6
Credit Hours (lecture + exercises):	4 (3 + 2)

Module Description

The course contain the following topics: Laplace transformation, its inverse and how to be used in solving differential equations. Gamma, Beta and Bessel functions and their properties. Orthogonal Polynomials (Legendre - Luger - Hermite). Fourier Transformation and Integration and their Applications..

Module Aims

Objectives of the course

1	Knowledge of Laplace transformation , its inverse and how to use in solving differential equations.
2	Knowledge of Gamma , Beta and Bessel functions of the first and second type and their properties - the orthogonal formula.
3	Studying of orthogonal polynomials (Legendre - Luger – Hermite).
4	Knowledge of Fourier transformation - Fourier integration and its properties and applications.
5	The ability to find Calculus Fourier.

Education Outcomes: (**understanding**, **knowledge**, **skills and the mental process**)

1	Identify Laplace transformation , its inverse and how to account it for some basic functions.
2	Knowledge of definitions of Gamma, Beta and Bessel functions.
3	Knowledge of some orthogonal Polynomials.
4	Identify Fourier transformation and integration.
5	Distinguish between mathematical concepts.
6	Contact her class mates to solve tutorials as a team work.

Course Content

(**Hours**)	(**Weeks**)	(**Subjects**)
10	2	Giving knowledge about solving differential equations using power series methods.
15	3	Develop the skill to distinguish between the different forms of the question Sturm- to Yeovil.
15	3	The distinction between the different types of functions and special knowledge of their properties.
15	3	The deployment of some skills using orthogonal polynomial functions.
10	2	The use of Fourier transformation to find solutions to some differential equations
10	2	Giving knowledge about solving differential equations using power series methods.
75	**15**	Total

:Textbook and supporting References

Textbook title	Mathematical methods in Fourier analysis
Author's Name	Mohammed bin Abdulrahman Gwaiz
Publisher	Riyadh
Publishing Year	1999
Reference (1)	Private functions and some of its applications
Author's Name	Faleh al-Dossari and Muhammad Abduh
Publisher	Al Qussaim university
Publishing Year	1431
Reference (2)	Differential Equations (Part I - Part II)

Author's Name	Prof. Hassan and others Alaweida
Publisher	Rushd Library
Publishing Year	1427/2006
Reference (3)	Fourier Analysis and its Applications
Author's Name	Geral B. F Fourier Folland
Publisher	Pacific Grove
Publishing Year	1992

(Model) 5

Summary Course Description

Module Information

Scheduled Information:

Course Name	Group Theory
Course Number	MATH 322
Name and number Prerequisite:	MATH 214+ MATH 224
Course level:	6
Credits:	3 (2 lecture + 2 exercises)
Module Title:	Group Theory
Module ID:	MATH 322
Prerequisite:	MATH 214+ MATH 224
Level:	6
Credit Hours(lecture + exercises):	3 (2 + 2)

Module Description

	Definitions and examples - group – partial group – generated group - Circular group - associated groups and the theory of Lagrange - group kernell - group center and centralized and orderly - equivalent classroom - honking division - isomorphism and symmetry - self symmetries - honking permutations - the theory Kayley- direct multiplication of factions (outer and internal) - the impact on the group factions P - Silo theories - Cauchy theorem.

Module Aims

Objectives of the course

1	Understanding some of the group bases and the application.
2	Knowledge of the types of group and resolve issues on them.
3	knowledge of homomorphism and its types.
4	Resolving issues on the symmetries and sequence self-computation
5	Silo use theorem and its applications in the classification of group limits

Education Outcomes: (**understanding**, **knowledge**, **skills and the mental process**)

1	Giving students the skill to distinguish between groups.
2	Giving students the skill to distinguish between homomorphism types.
3	Understand some advanced algebraic concepts and solving their related issues.
4	Giving students the skill of communication and discussion to stimulate mathematical thinking in solving mathematical problems.
5	Giving students the ability to analysis and reasoning and problem-solving method.

Course Content

(**Hours**)	(**Weeks**)	(**Subjects**)
20	5	Basic concepts - groups - partial group- generated group – cyclic group- groups and groups associated with the theory of Lagrange – group kernel - group center and centralized and orderly - equivalent classroom.
12	3	Isomorphism and symmetry - self symmetries - self permutations.
12	3	Kayley theorem - direct multiplication of functions (external and internal).
16	4	The impact of the group factoring P Group - theories Silo - Cauchy theorem.
60	**15**	Total

:Textbook and supporting References

Textbook title	Introduction to Group Theory
Author's Name	Abdullah hungry and Judge Mohammed
Publisher	Rushd Library
Publishing Year	1425
Reference (1)	The entrance to group theory

Author's Name	Faleh al-Dossari and Abdul Hamid Beck
Publisher	Umm Al Qura University
Publishing Year	1997
Reference (2)	Topics in algebra
Author's Name	And Ali Fawzi Thukair Asheibani (interpreter)
Publisher	King Saud University
Publishing Year	1995

(Model) 5

Summary Course Description

Module Information

Scheduled Information:

Course Name	mathematical applications on the computer
Course Number	MATH 327
Name and number Prerequisite:	MATH 311
Course level:	6
Credits:	3 (2 lecture + 2exercises)
Module Title:	Mathematical applications on the Computer
Module ID:	MATH 327
Prerequisite:	MATH 311
Level:	6
Credit Hours (lecture + exercises):	3 (2 + 2)

Module Description

	Introduction to mathematical program Mat lab interface program. Using the command window in Mat lab program - Definition of basic operations - put addresses during programming - linear algebra at the command window - drawing two-dimensional-type M-file files in MAT LAB. Use MAT LAB software to calculate: eigenvalues - critical values of functions - the application of numerical solutions and calculation errors (nonlinear equations - systems of linear equations - interpolation - Numerical methods of calculus integrals numerical - solving differential equations of the first order and three-dimensional painting – modeling.

Module Aims

Objectives of the course

1	Definition of the importance of the Mat lab and the characteristics and advantages program.	
2	The development of student skills in the use of Mat lab program of two thousand many branches of mathematics and its applications.	
3	The development of student skills in programming modes and writing M-file files.	
4	The development of student skills in creating graphics in two-dimensional and triangular control.	

Education Outcomes: (**understanding**, **knowledge**, **skills and the mental process**)

1	It enables students to use Mat lab program of two thousandth all branches of mathematics and its applications.	
2	It enables the student to the application on the Mat lab software to find some numerical solutions in some branches of mathematics.	
3	It enables the student to programming and writing documents are marked as M-file.	
4	Student's ability to create graphics in two-dimensional and triangular control.	

Course Content

(**Hours**)	(**Weeks**)	(**Subjects**)
4	1	Introduction to Mat lab program.
24	6	Use the command window in Mat lab program - Linear Algebra in the window Command-drawing two-dimensional -writing M-file files in MAT LAB.
32	8	Use MATLAB software to calculate: eigenvalues - critical values of functions - the application of numerical solutions and calculation errors - non-linear equations - systems of linear equations - interpolation - Numerical methods of calculus integrals numerical - solving differential equations of the first three-and drawing Rank dimensional -simulation.
60	**15**	Total

:Textbook and supporting References

Textbook title	Matlab for Engineers

Author's Name	Holly Moore
Publisher	Pearson Education Limited
Publishing Year	2013
Reference (1)	Numerical Computing with Matlab
Author's Name	Cleve B.Moler
Publisher	Siam (Society for Industrial and Applied Mathematics)
Publishing Year	2004
Reference (2)	Mat lab an introduction with applications
Author's Name	Amos Gilat
Publisher	SI Version
Publishing Year	2011

(Model) 5

Summary Course Description

Module Information

:Scheduled Information

Course Name	Introduction to topology
Course Number	MATH 323
Name and number Prerequisite:	MATH 312
Course level:	6
Credits:	4 (3 lecture +2 exercises)
Module Title:	Introduction to Topology
Module ID:	MATH 323
Prerequisite:	MATH 312
Level:	6
Credit Hours (lecture + exercises):	4 (3 + 2)

Module Description

The course contain the following topics:
Topological Spaces: Definitions and examples. closure Sets – Sets of partial spaces
Rules – the limited topological product – partial rules
The metric spaces : examples - the metric problem
continuous Functions: Examples - Classification of continuous functions over the topological and metric spaces - topological equivalence, Examples, Topological property.

Compact spaces: Examples, Compactness in, Compactness by the endpoint, Compactness by sequences.

Module Aims

1	Define topological spaces and give examples.	
2	distinguishes between open and closed groups.	
3	Recognize the concept of equivalence topological and topological property.	
4	Identify the continuous functions and the ability of classifying them over the topological and metric spaces.	
5	Knowledge of compactness by a point , sequences and metric spaces.	

Education Outcomes: (**understanding**, **knowledge**, **skills and the mental process**)

1	Usage of the abstract mathematical concepts
2	Improve the ability of formulating a true mathematical proofs
3	Have the ability of making a right mathematical expression
4	Have the ability of analyzing, giving the reasons and solving problems .
5	Distinguish between mathematical concepts.
6	Contact her class mates to proof tutorials' theorem .

Course Content

(**Hours**)	(**Weeks**)	(**Subjects**)
10	2	Topological Spaces: Definitions and examples .
10	2	Sets closure – Sets of partial spaces
10	2	Rules – the limited topological product – partial rules
15	3	The metric spaces : examples - the metric problem
15	3	Continuous Functions: Examples - Classification of continuous functions over the topological and metric spaces - topological Equivalence, Examples, Topological property.

15	3	Compact spaces: Examples, Compactness in R^n ,Compactness by the endpoint, Compactness by sequences.
75	**15**	Total

الكتاب المقرر والمراجع المساندة:

Textbook title	The foundations of the year topology
Author's Name	Ahmed Allam Monsef
Publisher	Dar Al Zaman Publishing
Publishing Year	1423
Reference (1)	Introduction to general topology
Author's Name	Ahmed Mohamed Zahran
Publisher	King Saud University
Publishing Year	-
Reference (2)	General Topology
Author's Name	Kelly. J. , Van Nostrand
Publisher	Princeton New Jersey
Publishing Year	1955

(Model) 5

Summary Course Description

Module Information

Scheduled Information:

Course Name	Introduction to Partial Differential Equations
Course Number	MATH 415
Name and number Prerequisite:	MATH 313
Course level:	7
Credits:	4 (3 lecture +2 exercises)
Module Title:	Introduction to Partial Differential Equations
Module ID:	MATH 415
Prerequisite:	MATH 313
Level:	7
Credit Hours (lecture + exercises):	4 (3 + 2)

Module Description

	The basic concepts of partial differential equations: the origin of partial differential equations – first order partial differential equations - second order partial differential equations and higher-order applications - partial differential equations with constant coefficients Partial Differential Equations rating: hyperbolic equations - bonus equations - wave equation and the equation of heat spread of the Laplace equation and solved by separable variables - solve the heat equation and wave equation and Laplace equation in one dimension. Linear partial differential equations of second order with fixed and variable transaction: methods of solving nonlinear partial differential equations from Class II- Fourier series and Fourier integrals - orthogonal functions and applications of the method of Fourier. Thermal equations and Laplace equation: Ways to solve the Laplace equation - harmonic functions - equation in one and two dimensions - solution using Fourier series - Heat equation in one dimension is limited and unlimited use of the Fourier series and Fourier transformation.

Module Aims

Objectives of the course

1	Giving the student the basic concepts of partial differential equations.
2	Develop the student's ability to classify partial differential equations.
3	Study the methods of solving the linear partial differential equations of second order with constant and variable coefficients.
4	Knowledge of methods of solving linear equation of higher orders with constant and variable coefficients.
5	Knowledge of the importance of the various applications of the linear partial differential equations

Education Outcomes: (**understanding**, **knowledge**, **skills and the mental process**)

1	understand the basic concepts in partial differential equations.
2	The ability to distinguish between the types of partial differential equations of second order.
3	Give the student the ability of analysis, give reasons and solving problems.
4	Acquire the student the skill of expression and conversation to stimulate mathematical thinking and understanding and solving mathematical problems.

5	Acquire the student the ability of distinguishing between different types of partial differential equations.
7	Distinguish between mathematical concepts.
8	Contact her class mates and work as a team work to present course scientific research.

Course Content

(**Hours**)	(**Weeks**)	(**Subjects**)
15	3	The basic concepts of partial differential equations.
20	4	Classification of partial differential equations.
20	4	Linear partial differential equations of second order of transactions and variable.
20	4	Thermal equations and Laplace equation.
75	**15**	Total

:Textbook and supporting References

Textbook title	differential equations
Author's Name	Frank Ayers
Publisher	Dar Makjroheel Publishing - Arabic edition
Publishing Year	1976
Reference (1)	Introduction to Partial Differential Equations and Boundary Value Problems
Author's Name	Rene Den Meyer
Publisher	McGraw-Hill
Publishing Year	-
Reference (2)	Partial Differential Equations: an Introduction
Author's Name	Walter A. Strauss
Publisher	John Wiley & Sons
Publishing Year	1992

(Model) 5

Summary Course Description

Module Information

Scheduled Information:

Course Name	Rings and fields
Course Number	MATH 414
Name and number Prerequisite:	MATH 322
Course level:	7
Credits:	3 (2 lecture + 2 exercises)
Module Title:	Rings and Fields
Module ID:	MATH 414
Prerequisite:	MATH 322
Level:	7
Credit Hours (lecture + exercises):	3 (2 + 2)

Module Description

The course contain the following topics:
Ring , commutative Ring, Ring with the Identity- examples
Partial Ring – Ideals - Divisors Field.
Rings Identity and homomorphism – homomorphism theorems
Prime Ideals – maximum Ideals - Divisors Field
Ring of Polynomial - roots of polynomial fields on a field
Extensions of Fields – simple and limited extensions – Partitioning field - - algebraic closure of a field – principles of Galois theory.

Module Aims

Objectives of the course

1	Knowledge of the basic concepts of Rings, Homomorphism and Fields.
2	Understand the special theorems of Ideals and Fields.
3	Develop the ability of understanding the new algebraic structures.
4	The ability of formulating mathematical sentences skillfully.
5	Develop the ability of analyzing , give reasons and solving problems techniques

Education Outcomes: (**understanding**, **knowledge**, **skills and the mental process**)

1	Definition of the Rings and examples.
2	Definition homomorphism and examples.
3	Resolving exercises on ideals.

4	Definition of polynomials and examples.
5	Definition of limited Fields and solving problems of them.
7	Distinguish between mathematical concepts.
8	Contact her class mates and work as a team work to present course scientific research.

Course Content

(**Hours**)	(**Weeks**)	(**Subjects**)
8	2	Ring, commutative Ring, Ring with the Identity- examples
8	2	Partial Ring – Ideals - Divisors Field.
8	2	Rings Identity and homomorphism – homomorphism theorems
8	2	Prime Ideals – maximum Ideals - Divisors Field
12	3	Ring of Polynomial - roots of polynomial fields on a field
16	4	Extensions of Fields – simple and limited extensions – Partitioning field - - algebraic closure of a field – principles of Galois theory.
60	**15**	Total

:Textbook and supporting References

Textbook title	Ring theory and field extension
Author's Name	Joseph Thursday
Publisher	Publications King Saud University
Publishing Year	1998
Reference (1)	Introduction to the theory of rings and fields
Author's Name	Faleh al-Dossari
Publisher	Umm Al Qura University
ublishing Year	1420
Reference (2)	A first Course in Abstract Algebra.
Author's Name	J.B.Farieigh
Publisher	Addison–Wesley
Publishing Year	1989

(Model) 5

Summary Course Description

Module Aims

Objectives of the course

Course Name	Real Analysis (2)
Course Number	MATH 412
Name and number Prerequisite:	MATH 312
Course level:	7
Credits:	4 (3 lecture +2 exercises)
Module Title:	Real Analysis (2)
Module ID:	MATH 412
Prerequisite:	MATH 312
Level:	7
Credit Hours (lecture + exercises):	4 (3 + 2)

Module Description

Riemann integration: the ability of integration **using** Riemannian procedure - Darbo theory and aggregates Riemannian- fundamental theorem of calculus.
Markov sequences and functions: sequences and Markov duality- regular convergence of sequences and Markov functions - power series.
Lebesgue Measurement: algebra and algebra of Sigma - external Lebesgue measuring - a measure of the Lebesgue and properties - functions measurable on the way to Lebesgue.
Lebesgue Integration: definition of Integration Lebesgue theory - the theory of sequential convergence - convergence - the relationship between integration and integration of Riemann Lebesgue.

Module Aims

Objectives of the course

1	The ability of understanding different definitions and theorems related to Riemann integration.
2	Develop the skills of the student to study the point congruence and the normal convergence.
3	Develop the skills of the student to study algebra and sigma algebra.
4	Training the student to study measurable sets, Lebesgue measure and its properties.
5	Studying of simple functions and measurable functions.
6	Studying of Lebesgue Integration, convergence Theorems , the relationship between the Riemann integration and Lebesgue integration

Education Outcomes: (**understanding**, **knowledge**, **skills and the mental process**)

1	Understand the basic concepts of Riemann integration and Darbo theorem – the main theorem in calculus
2	Study the sequences and series of functions – point convergence and normal convergence - algebra and sigma algebra
3	Study of limited addition property and countable addition
4	Study the basic extension theorems – external measure – measurable sets.
5	Understand Lebesgue measure and its property - Lebesgue integration – the relation between Riemann integration and Lebesgue integration
7	Distinguish between mathematical concepts.
8	Contact her class mates as a team work to present course scientific research.

Course Content

(**Hours**)	(**Weeks**)	(**Subjects**)
15	3	Riemann integration
20	4	Markov sequences and functions
20	4	Lebesgue Measuring
20	4	Lebesgue Integration
75	**15**	Total

:Textbook and supporting References

Textbook title	Principles of Real Analysis (Part II)
Author's Name	Dr.. Saleh al-Sanusi and d. Mohammed Gwaiz
Publisher	Hla Press
Publishing Year	1419
Reference (1)	Principles of Real Analysis
Author's Name	Mahmoud Mohammed Kutkut
Publisher	Dar Mars
Publishing Year	1410/1990
Reference (2)	Real Analysis
Author's Name	H. L.Royden

Publisher	Macmillan Publishing Co., Inc. New York, 3rd edition
Publishing Year	1988

(Model) 5

Summary Course Description

Module Information

Scheduled Information:

Course Name	Complex Analysis
Course Number	MATH 413
Name and number Prerequisite:	MATH 312
Course level:	7
Credits:	3 (2 lecture + 2 exercises)
Module Title:	Complex Analysis
Module ID:	MATH 413
Prerequisite:	MATH 312
Level:	7
Credit Hours (lecture + exercises):	3 (2 + 2)

Module Description

The course contain the following topics:
Complex numbers system: Algebra of complex numbers - Cartesian representation of complex numbers - Representation of complex numbers in the plane - The polar formula for the complex number - powers and roots of complex numbers.
Functions of complex variable: Function of a complex variable- Powers and roots of complex numbers - The limit, continuity and differentiation of the complex functions - Primary functions and linear transformations and their functional properties - Analytic and harmonic functions - Cauchy conditions - Riemann Integration for the analytical function - Simple functions (exponential, trigonometric and hyperbolic, inverse trigonometric, logarithmic and complex exponents).
Integration of complex functions: Complex integration - Traces and integration on the traces – Independency of traces - Cauchy's theorem of integration and its applications - The basic theorems of Integration - Cauchy Integration formulas for derivatives - Liouville's theory.
Representation of analytic and non-analytical functions by using series: Convergence of sequences and series – Taylor's series – Laurent's series - Power series - The outliers, zeros and poles.
Cauchy's theory of residuals: Cauchy's theory of residuals and its applications in calculating real and improper integrations of functions.

Module Aims

Objectives of the course

1	Acquire the basic concepts and principles of complex analysis.
2	Develop the student skills in differentiation and integration of complex functions.
3	The ability of integrating complex functions using Cauchy theorem of integration.
4	Uunderstand and accommodate the representation of analytic functions by using series.
5	Training the student to calculate Taylor's series and Laurent's series for complex functions.
6	Knowledge of the importance of Complex Numbers and Complex functions in some natural applications.

Education Outcomes: (**understanding**, **knowledge**, **skills and the mental process**)

1	Acquire the basic concepts and principles of complex analysis.
2	Develop the student skills in calculating differentiation and integration of complex functions.
3	The ability of integrating complex functions using Cauchy theorem of integration.
4	Understand and accommodate the representation of analytic functions using series.
5	Training the student to calculate Taylor's series and Laurent's series for complex functions.
6	Knowledge of the importance of Complex Numbers and Complex functions in some natural applications.
7	Distinguish between mathematical concepts.
8	Contact her class mates as a team work to solve course tutorials.

Course Content

(**Hours**)	(**Weeks**)	(**Subjects**)
8	2	**Complex numbers system**: Algebra of complex numbers - Cartesian representation of complex numbers - Representation of complex numbers in the plane - The polar formula for the complex number - powers and roots of complex numbers.
16	4	**Functions of complex variable:** Function of a complex variable- Powers and roots of complex numbers - The limit, continuity and differentiation of the complex functions - Primary functions and linear transformations and their functional properties - Analytic and harmonic functions - Cauchy conditions - Riemann Integration for the analytical function - Simple functions (exponential, trigonometric and hyperbolic, inverse trigonometric, logarithmic and complex exponents).
16	4	**Integration of complex functions:** Complex integration - Traces and integration on the traces – Independency of traces - Cauchy's theorem of integration and its applications - The basic theorems of Integration - Cauchy Integration formulas for derivatives - Liouville's theory.

12	3	**Representation of analytic and non-analytical functions by using series:** Convergence of sequences and series - Taylor's series - Laurent's series - Power series - The outliers, zeros and poles.
8	2	**Cauchy's theory of residuals:** Cauchy's theory of residuals and its applications in calculating real and improper integrations of functions.
60	**15**	Total

:Textbook and supporting References

Textbook title	Principles of Complex Analysis
Author's Name	Mahmoud Mohammed Kutkut
Publisher	Sunrise House
Publishing Year	2008
Reference (1)	Complex Analysis
Author's Name	Hassan Mustafa Alaweida
Publisher	Rushed Library Publishers
Publishing Year	2006
Reference (2)	Basics Complex Analysis
Author's Name	Mahmoud Abu Al Ezz and Fathi Abdel-Salam
Publisher	Hiraa House for Publishing and Distribution - Jeddah
Publishing Year	Principles of Complex Analysis
Reference (3)	Complex Analysis and Applications
Author's Name	Ruel V. Churchill & James Brown
Publisher	McGraw-Hill, 5th Edition
Publishing Year	1990

(Model) 5

Summary Course Description

Module Information

Scheduled Information:

Course Name	Introduction to Differential Geometry
Course Number	MATH 421
Name and number Prerequisite:	MATH 224
Course level:	8
Credits:	4 (3 lecture + 2 exercises)
Module Title:	Introduction to Differential Geometry

Module ID:	MATH 421
Prerequisite:	MATH 224
Level:	8
Credit Hours (lecture + exercises):	4 (3 + 2)

Module Description

The course contain the following topics: Study of internal and external geometry of curves in the space: Curves in the space, definition, properties, arc length, Frenet-frame, helix curve, differential Serett-Frenet formula, Some a special curves. Study of the internal and external geometry of surfaces in 3-dimentional space. Regular surface in the 3-dimentional space..

Module Aims

Objectives of the course

1	Understanding the Concept of the curve and the ability to find the arc length of the curve.	
2	The ability of mathematical skills in differentiating between the tangent , basic normal, binormal lines and plane. Also between concepts of curvature and torsion.	
3	The student's ability to identify the three planes (normal, osculating and the rectifier) and how to take advantage in the appointment equated.	
4	Understand **Serett-Frenet** differential formulas and know their ability to apply them to some of the curves like a helix curve.	
5	Students know some famous curves associated with the space curve.	
6	Grasping the concept of locus of the centers of the circle of curvature the sphere curvature and be able to differentiate between them.	
7	Develop the student's ability to deal with another concept, a surface known as the first student to the basic version and basic version of the second, and their significance.	
8	Knowledge of the student to the concept of normal curvature, Gaussian curvature and medium curvature lines.	

Education Outcomes: (**understanding**, **knowledge**, **skills and the mental process**)

1	Knowledge of the concept: the curve and how to find the length of the arc of the curve.

2	Studying of the tangent vectors, the basic normal line, and binormal line. and defining the concept of curvature and torsion.
3	Applying the definitions of the three planes (normal, osculating and rectifier) to find their equations .
4	Enabling students to use the Serret-Frenet Differential formulas in studying the properties of some famous curves such as the helixial curve.
5	Distinguish between the characteristics of the locus of the centers of the curvature circle and curvature sphere.
6	Understanding the concept: the surface and distinction between it and the concept of the curve –knowledge of the definitions: basic first formula (metric formula) and basic second formula.
7	Knowledge of the concept: the curve and how to find the length of the arc of the curve.
8	Distinguish between mathematical concepts.
9	Contact her class mates as a team work to make course scientific research.

Course Content

(**Hours**)	(**Weeks**)	(**Subjects**)
25	5	Part I: Study of special geometry (internal) of curves in the space: Chapter 1: Curves in the space.
25	5	Chapter 2: Some a special curves.
25	5	Part II: Study of the internal and external geometry of surfaces in the triple space. .Chapter 3: Regular surface in the triple space
75	**15**	

:Textbook and supporting References

Textbook title	Differential Geometry
Author's Name	Hassan Nassar Al salamy
Publisher	Rushd Library
Publishing Year	1429/2008
Reference (1)	Introduction to Differential Geometry
Author's Name	Willmore T. J.

Publisher	Oxford
Publishing Year	1959

(Model) 5

Summary Course Description

Module Information

Scheduled Information:

Course Name	Introduction to Functional Analysis
Course Number	MATH 425
Name and number Prerequisite:	MATH 323
Course level:	8
Credits:	3 (2 lecture + 2 exercises)
Module Title:	Introduction to Functional Analysis
Module ID:	MATH 425
Prerequisite:	MATH 323
Level:	8
Credit Hours(lecture + exercises):	3 (2 + 2)

Module Description

Metric space: complete metric space – discrete Spaces - standard Space (Definition and basic properties - Convergence and completeness - Linear operators).
Banach space: The theory of Banach Han - The weak convergence - Banach algebras.
Hilbert space: The space of inner product and Hilbert space - Orthogonal sets – Conjugate space over Hilbert space - Linear operators on Hilbert space.
Study some examples on: Hilbert spaces and Banach spaces - Lp spaces - the basic theories and basic inequalities.

Module Aims

Objectives of the course

1	Study of the Metric space and the most fundamental concepts related to it.
2	Study of Banach space and most fundamental concepts related to it.
3	Knowledge of Hilbert space and the concepts related to it.
4	Training the student with many examples of Hilbert spaces and Banach spaces.
5	Knowledge of L^p spaces, the basic theories and the basic inequalities

Education Outcomes: (**understanding**, **knowledge**, **skills and the mental process**)

1	Distinguish between different types of spaces.
2	Understand Banach's algebras.
3	Understand the concept of the theory of Banach Han.
4	Understand the concept of a Hilbert space and space accompanying him.
5	Training student by some examples of the different spaces.
6	Introduce students to L^p spaces, the principals theories and inequalities.
7	Distinguish between mathematical concepts.
8	Contact her class mates as a team work to make a course scientific research.

Course Content

(**Hours**)	(**Weeks**)	(**Subjects**)
16	4	Metric space: complete metric space – discrete Spaces - standard Space (Definition and basic properties - Convergence and completeness - Linear operators).
20	5	Banach space: The theory of Banach Han - The weak convergence - Banach algebras.
16	4	Hilbert space: The space of inner product and Hilbert space - Orthogonal sets – Conjugate space over Hilbert space - Linear operators on Hilbert space.
8	2	Study some examples on: Hilbert spaces and Banach spaces - L^p spaces - the basic theories and basic inequalities.
60	**15**	Total

:Textbook and supporting References

Textbook title	Functional Analysis series - first version
Author's Name	Fadwa Mohammed Khamis Al-Ghamdi
Publisher	Safa Press
Publishing Year	1430
Reference (1)	Elements of Functional Analysis
Author's Name	I. J. Maddox
Publisher	Cambridge University Press

Publishing Year	1970
Reference (2)	Functional Analysis
Author's Name	W.Rudin
Publisher	TATA McGraw-Hill Pup. Company LTD, New Delhi
Publishing Year	1973

(Model) 5

Summary Course Description

Course Name	Introduction to statistical inference
Course Number	STAT 423
Name and number Prerequisite:	STAT 223
Course level:	8
Credits:	3 (2 Lecture + 2 exercises)
Module Title:	Introduction to Statistical Inference
Module ID:	STAT 423
Prerequisite:	STAT 223
Level:	8
Credit Hours (Lecture + exercises):	3 (2 + 2)

Module Description

The course contain the following topics:
Random Samples Include: parameters space and sample space – the mean and variance of a sample - the distribution of the mean of a sample taken from a normal society - Law of large numbers from a statistical perspective - The central limit theorem and natural approximation to the binomial distribution.
Distributions of Functions with Random Variables.
Random Samples: The distribution of the sample mean - The large numbers law – the Central limit theorem.
Basic Principles in the Estimation Include: Unbiased estimators - Types of appreciation (by point, Appreciation by interval) - accuracy of Estimation by point (Squares average of the estimated error and the estimated variance) - Consistency – Sufficiency - The effectiveness of the estimation - Fisher Information – Kramer's Inequality - Rao and its use to obtain the unbiased estimator with a regular minimum variance - Method of moments to get an estimation - The greatest possibility method and display the properties of the greatest possibility estimator - The minor squares method – Bayz method.

Confidence Intervals which covers: Coaxial quantity and their use to find confidence intervals - The confidence interval of the mean - The difference between two means – the variance – Ratio of two variances.
Tests of Hypotheses which cover: Test of hypotheses around: the mean of one society - the difference between means of two independent societies.

Module Aims

Objectives of the course

1	Knowledge of the basic concepts of statistical inference.
2	Knowledge of the basic information that lead to move from description to the decision-making.
3	A good understanding, reading and the application of some statistical techniques in several fields.
4	The ability of using estimation theorem in various practical applications.
5	Develop the ability of using some of the mathematical programs needed in this course

Education Outcomes: (**understanding**, **knowledge**, **skills and the mental process**)

1	Dealing with databases and statistical analysis and applied them in the life problems.
2	Data analysis for the given data.
3	Find confidence intervals and testing hypothesis.
4	Estimation of society the parameters according to the samples under study.
5	Understanding the basic methods of analyzing the variance in one and tow directions.
6	Application of using some mathematical programs in some parts of this course as EXCEL, SPSS.
7	Distinguish between mathematical concepts.
8	Contact her class mates.

Course Content

(**Hours**)	(**Weeks**)	(**Subjects**)
8	2	**Random Samples Include:** parameters space and sample space – the mean and variance of a sample - the distribution of the mean of a sample taken from a normal society - Law of large numbers from a statistical perspective - The central limit theorem and natural approximation to the binomial distribution.
8	2	**Distributions of Functions with Random Variables.**

8	2	**Random Samples:** The distribution of the sample mean – The large numbers law – the Central limit theorem.
20	5	**Basic Principles in the Estimation Include:** Unbiased estimators - Types of appreciation (by point, Appreciation by interval) - accuracy of Estimation by point (Squares average of the estimated error and the estimated variance) - Consistency – Sufficiency - The effectiveness of the estimation - Fisher Information – Kramer's Inequality - Rao and its use to obtain the unbiased estimator with a regular minimum variance - Method of moments to get an estimation - The greatest possibility method and display the properties of the greatest possibility estimator - The minor squares method – Bayz method.
8	2	**Confidence Intervals which covers:** Coaxial quantity and their use to find confidence intervals - The confidence interval of the mean - The difference between two means – the variance – Ratio of two variances.
8	2	**Tests of Hypotheses which cover:** Test of hypotheses around : the mean of one society - the difference between means of two independent societies
60	**15**	Total

:Textbook and supporting References

Textbook title	Basics and methods of statistical analysis
Author's Name	Adnan Majid Barre, and Mahmoud Hindi, Husseini
Publisher	Publications King Saud University
Publishing Year	1998
Reference (1)	Introduction to statistical methods
Author's Name	Sayyad Jalal and Mohammed Habib
Publisher	Okaz
Publishing Year	1410
Reference (2)	Introduction to Statistical Inference
Author's Name	E. S. Keeping
Publisher	D. Van Nostrand Company
Publishing Year	1995

(Model) 5

Summary Course Description

Module Information

Scheduled Information:

Course Name	Research Project
Course Number	MATH 424
Name and number Prerequisite:	Complete 108 credit hours
Course level:	8
Credits:	2 (2 Lecture + - practical)
Module Title:	Research Project
Module ID:	MATH 424
Prerequisite:	Complete 108 credit hours
Level:	8
Credit Hours (Lecture + exercises):	2 (2 + –)

Module Description

	Determined according to the students' attended suggestions and Research Project Committee acceptance

Module Aims

Objectives of the course:

Students have the following skills:

1	Write a scientific proposal correctly.	
2	Discussion, analysis, persuasion and flexible to accept the criticism.	
3	Using mathematical and statistical programs to write scientific researches if needed.	
4	Write references, appendices and abstracts correctly	
5	Writing, ordering and presenting the research correctly. .	
6	Training students to use some sports programs when needed.	

Education Outcomes: (**understanding**, **knowledge**, **skills and the mental process**)

1	Discussion, Analysis, persuasion and flexible to accept the criticism
2	Knowledge of writing references, appendices and abstracts correctly.
3	Training students to dialogue, discussion and scientific presentation of the research.
4	Knowledge of writing, ordering and presenting the research correctly.

5	Write a scientific proposal from the supported programs of writing researches correctly.
6	Training the student to use mathematical programs if needed.
7	Contact her class mates and work as a research team work

Course Content

Contact Hours	No. of Weeks	List of Topics
30	15	Determined according to the students' attended suggestions and Research Project Committee acceptance

:Textbook and supporting References

Textbook title	It varies depending on the specialization chosen by the student and the supervisor of the research
Author's Name	-
Publisher	-
Publishing Year	-