



جامعة المجمعة
Majmaah University



كلية الهندسة
College of Engineering

Basic Engineering Sciences Course Specifications

Approved by the department council no. 1 on
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on December 3, 2014

المملكة العربية السعودية
وزارة التعليم
جامعة المجمعة
كلية الهندسة

Kingdom of Saudi Arabia
Ministry of Education
Majmaah University
College of Engineering



جامعة المجمعة
Majmaah University



كلية الهندسة
College of Engineering

Basic Engineering Sciences
Course Specifications

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MATH 105

Course Specification

Institution: Majmaah University
College/Department: Faculty of Engineering-Basic Science Department

A Course Identification and General Information

1. Course title and code: Math 105
2. Credit hours: 3 (3, 1, 0)
3. Program(s) in which the course is offered: college requirement
4. Name of faculty member responsible for the course: Dr. Ilyas Khan
5. Level/year at which this course is offered: freshman year, fall semester
6. Pre-requisites for this course (if any):
7. Co-requisites for this course (if any):
8. Location if not on main campus: Faculty of Engineering buildings

B Objectives

Set of numbers (real numbers), Average rate of change,
Limit, Continuity, Derivatives: (definition, properties)
Chain rule, implicit differentiation, Higher order derivatives, Equations of tangent and normal lines
Differentiation of (trigonometric, logarithmic, exponential, hyperbolic, inverse of trigonometric, inverse of hyperbolic) functions
Local extrema, concavity
Related rates, horizontal and vertical asymptotes
Applications of derivatives (Mean Value Theorem, Rolle's Theorem).
Function into two or three variables: their limits, their continuity
Partial derivatives

C. Course Description (Note: General description in the form to be used for the Bulletin or Handbook should be attached)

1 Topics to be Covered		
List of Topics	No of Weeks	Contact hours
Set of numbers (real numbers), Average rate of change, Limit, Continuity, Derivatives: (definition, properties)	3	9
Chain rule, implicit differentiation, Higher order derivatives,	2	6
Differentiation of (trigonometric, logarithmic, exponential, hyperbolic, inverse of trigonometric, inverse of hyperbolic) functions.	2	6
Local extrema, concavity	2	6
Related rates, horizontal and vertical asymptotes, Applications of derivatives (Mean Value Theorem, Rolle's Theorem).	3	9
Function into two or three variables: their limits, their continuity, Partial derivatives.	4	12

2 Course components (total contact hours per semester):				
Lecture: 45	Tutorial: 15	Laboratory:---	Practical/Field work/Internship	Other: Office hours 30 hours (2 hours per week)

3. Additional private study/learning hours expected for students per week. (This should be an average: for the semester not a specific requirement in each week)
3 lectures and 1 exercise hour per week

<p>4. Development of Learning Outcomes in Domains of Learning</p> <p>For each of the domains of learning shown below indicate:</p> <ul style="list-style-type: none"> • A brief summary of the knowledge or skill the course is intended to develop; • A description of the teaching strategies to be used in the course to develop that knowledge or skill; • The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned. 	
<p>a. Knowledge</p>	
<p>(i) Description of the knowledge to be acquired</p> <ol style="list-style-type: none"> 1. Calculate the derivatives of different types of functions. 2. Determine the property and formulation of academic derivatives. 3. Use some techniques of derivatives to solve different differential problems 4. Use derivative to find equations of normal and tangent lines. 5. Use Differential calculus in engineering applications 6. Use derivatives to find extreme values of a function. 7. Several variables function, Limit and continuity and their derivatives. 	
<p>(ii) Teaching strategies to be used to develop that knowledge</p> <p>Lectures using smart board. Discussions. Handout of lecture notes for each topic</p>	
<p>(iii) Methods of assessment of knowledge acquired</p> <p>Continuous feedback, oral. Quizzes. Major exams and final exam.</p>	
<p>b. Cognitive Skills</p>	
<p>(i) Description of cognitive skills to be developed</p> <p>Each student is expected to prepare a topic related to the course and present it for the whole class.</p> <p>Frequent assignments during the term.</p>	
<p>(ii) Teaching strategies to be used to develop these cognitive skills</p> <p>Topics are to be selected by the lecturer, then to be distributed for the students, and each student is to prepare the material for each topic and to present it for the whole class.</p> <p>Students are required to deliver a summary for some topics related to the course.</p>	

(iii) Methods of assessment of students cognitive skills

Evaluation of the topics prepared by students according to the content, arrangement, and covering of the topic.

Evaluation of the student presentation according to certain criteria.

Evaluation of the student preparations.

c. Interpersonal Skills and Responsibility

(i) Description of the interpersonal skills and capacity to carry responsibility to be developed

Students are expected to develop certain teamwork activities regarding the theoretical part.

(ii) Teaching strategies to be used to develop these skills and abilities

Part of some lectures will be specified for group discussions. At least students will be distributed into groups once monthly for discussing certain issues in the theoretical part.

(iii) Methods of assessment of students interpersonal skills and capacity to carry responsibility

Observe students during their interactions and discuss with them their point of view regarding the issues under discussion.

Evaluating students interactions in the lab as well as in the classroom

d. Communication, Information Technology and Numerical Skills

(i) Description of the skills to be developed in this domain.

Encourage students to use internet for searching certain electronic journals regarding topics of the course.

Students are required to prepare and present subjects using different educational strategies (power point presentations,)

(ii) Teaching strategies to be used to develop these skills

Students will be asked for delivering a summary regarding certain topics related to the course.

Each student is expected to prepare and present one issue regarding to the course for about 15 minutes.

At the end of each week, students are to submit a log regarding their practice in that week.

(iii) Methods of assessment of students numerical and communication skills

Part of the grade is put for students written participations.

<p>About 10 grades are put for the presentation (written and way of presentation)</p> <p>Each log delivered by the student will be objectively evaluated.</p>
<p>e. Psychomotor Skills (if applicable)</p>
<p>(i) Description of the psychomotor skills to be developed and the level of performance required</p> <p>Students are expected to measure different mathematical quantities related to the course.</p> <p>Students are expected to prepare small useful projects related to the course.</p>
<p>(ii) Teaching strategies to be used to develop these skills</p> <p>All skills that are required from the student will be performed for the student in the section.</p>
<p>(iii) Methods of assessment of students psychomotor skills</p> <p>Part of the final evaluation will be performed by the supervisor in the section.</p>

5. Schedule of Assessment Tasks for Students During the Semester			
Assessment	Assessment task	Week due	Proportion of Final Assessment
1	First exam	7	20
2	Second exam	13	20
3	Quizzes	During the term	10
4	Exercises	During the term	5
5	Activities	During the exam	5
6	Final written exam		40

D. Student Support

<p>1. Arrangements for availability of teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)</p> <p>Two office hours per day for student consultations and academic advice.</p>

E. Learning Resources

<p>1. Required Text(s): Thomas, G. B. and Finney, R. L., " Calculus and Analytic Geometry", Addison Wesley, (11th edition)</p>
<p>2. Essential References Essential References: Calculus: Early Transcendentals, J. Stewart, Brooks Cole</p>
<p>3- Recommended Books and Reference Material (Journals, Reports, etc) (Attach List)</p> <ol style="list-style-type: none"> Howard Anton, "Calculus with Analytical geometry" John Wiley & Sons, Latest edition. References: Calculus: Early Transcendentals, J. Stewart, Brooks Cole The first course of calculus for science and engineering students, by Abd Wahid Md Raji et al. 2013.

4-Electronic Materials, Web Sites etc

5- Other learning material such as computer-based programs/CD, professional standards/regulations

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Lecture rooms, laboratories, etc.)

Lecture rooms

2. Computing resources

One computer in the Lecture.

Smart board. in Lecture

Data show. in Lecture rooms

3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list)

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching

Asking question before, during and after each lecture.

Perform a quiz after each unit.

The exams and student participations

2 Other Strategies for Evaluation of Teaching by the Instructor or by the Department

Oral and written questions and questioner forms.

3 Processes for Improvement of Teaching

Continuous updating of the course content.

Looking for more clarifying examples.

Continuous assessment of student's acquiring of knowledge and skills.

4. Processes for Verifying Standards of Student Achievement (eg. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

Discussion of the course objectives, teaching strategies, exams, students learning abilities and achievements, with another colleague in the same field.

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

Continuous evaluation of the students during the term, and frequent updating of the course content.

MATH 106

Course Specification

Institution: Majmaah University
College/Department: Faculty of Engineering - Basic Science Department

A Course Identification and General Information

1. Course title and code: Math 106
2. Credit hours: 3 (3, 1, 0)
3. Program(s) in which the course is offered: College Requirement
4. Name of faculty member responsible for the course: Dr. Ilyas Khan
5. Level/year at which this course is offered: freshman year, spring semester
6. Pre-requisites for this course (if any): Math 105
7. Co-requisites for this course (if any):-----
8. Location if not on main campus: Faculty of Engineering buildings

B Objectives

Summary of the main learning outcomes for students enrolled in the course.

- 1- Calculate the integral of functions which admit an usual primitives.
- 2- Determine the property and formulation of academic integrals.
- 3- Use some techniques of integration to solve different integration problems
- 4- Improper integration and its different types
- 5- Use integration calculus in engineering applications: calculus of areas, volumes, lengths,
- 6- Use double integral calculus, areas and volumes. Double integrals in polar coordinates
- 7- Use triple integral in cylindrical and spherical coordinates calculus volume, moment and center of mass, moment of inertia and centroids, Vector fields, line integrals, surface integrals, Green's theorem, the divergence theorem and Stokes' theorem

2. Briefly describe any plans for developing and improving the course that are being implemented. (eg increased use of IT or web based reference material, changes in content as a result of new research in the field)

- 1- Add some of the examples (applications) in the science of engineering.
- 2- Add some new references.

C. Course Description (Note: General description in the form to be used for the Bulletin or Handbook should be attached)

1 Topics to be Covered		
List of Topics	No of Weeks	Contact hours
The definite integral, fundamental theorem of calculus, the indefinite integral, change of variable, numerical integration.	2	6
Area, volume of revolution, work, arc length.	2	6
Integration of inverse trigonometric functions, of logarithmic and exponential functions, of hyperbolic and inverse hyperbolic functions.	2	6
Techniques of integration: substitution, by parts, trigonometric substitutions, partial fractions, miscellaneous substitutions, indeterminate forms, improper integrals	3	9
Double integral, areas and volumes. Double integrals in polar coordinates.	2	6
Triple integral in cylindrical and spherical coordinates, volume, moment and center of mass. Vector fields, line integrals, surface integrals, Green's theorem, the divergence theorem, Stokes' theorem.	4	12

2 Course components (total contact hours per semester):

Lecture: 45	Tutorial: 15	Laboratory:----- -	Practical/Field work/Internship	Other: Office hours 30 hours (2 hours per week)
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3. Additional private study/learning hours expected for students per week. (This should be an average: for the semester not a specific requirement in each week)

3 lectures and 1 exercise hour per week

<p>4. Development of Learning Outcomes in Domains of Learning</p> <p>For each of the domains of learning shown below indicate:</p> <ul style="list-style-type: none"> • A brief summary of the knowledge or skill the course is intended to develop; • A description of the teaching strategies to be used in the course to develop that knowledge or skill; • The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.
<p>a. Knowledge</p>
<p>(i) Description of the knowledge to be acquired</p> <ol style="list-style-type: none"> 1- Calculate the integral of functions which admit an usual primitives. 2- Determine the property and formulation of academic integrals. 3- Use some techniques of integration to solve different integration problems 4-Improper integration and its different types 5- Use integration calculus in engineering applications: calculus of areas, volumes, lengths, etc 6-Use double integral calculus, areas and volumes. Double integrals in polar coordinates 7-Use triple integral in cylindrical and spherical coordinates calculus volume, moment and center of mass, Vector fields, line integrals, surface integrals, Green's theorem, the divergence theorem and Stokes' theorem
<p>(ii) Teaching strategies to be used to develop that knowledge</p> <p>Lectures using smart board. Discussions. Handout of lecture notes for each topic</p>
<p>(iii) Methods of assessment of knowledge acquired</p> <p>Continuous feedback, oral. Quizzes. Major exams and final exam.</p>
<p>b. Cognitive Skills</p>
<p>(i) Description of cognitive skills to be developed</p> <p>Each student is expected to prepare a topic related to the course and present it for the whole class.</p> <p>Frequent assignments during the term.</p>
<p>(ii) Teaching strategies to be used to develop these cognitive skills</p>

Topics are to be selected by the lecturer, then to be distributed for the students, and each student is to prepare the material for each topic and to present it for the whole class.

Students are required to deliver a summary for some topics related to the course.

(iii) Methods of assessment of students cognitive skills

Evaluation of the topics prepared by students according to the content, arrangement, and covering of the topic.

Evaluation of the student presentation according to certain criteria.

Evaluation of the student preparations.

c. Interpersonal Skills and Responsibility

(i) Description of the interpersonal skills and capacity to carry responsibility to be developed

Students are expected to develop certain team work activities regarding the theoretical part.

(ii) Teaching strategies to be used to develop these skills and abilities

Part of some lectures will be specified for group discussions. At least students will be distributed into groups once monthly for discussing certain issues in the theoretical part.

(iii) Methods of assessment of students interpersonal skills and capacity to carry responsibility

Observe students during their interactions and discuss with them their point of view regarding the issues under discussion.

Evaluating students interactions in the lab as well as in the classroom

d. Communication, Information Technology and Numerical Skills

(i) Description of the skills to be developed in this domain.

Encourage students to use internet for searching certain electronic journals regarding topics of the course.

Students are required to prepare and present subjects using different educational strategies

(PowerPoint presentations,
<p>(ii) Teaching strategies to be used to develop these skills</p> <p>Students will be asked for delivering a summary regarding certain topics related to the course.</p> <p>Each student is expected to prepare and present one issue regarding to the course for about 15 minutes.</p> <p>At the end of each week, students are to submit a log regarding their practice in that week.</p>
<p>(iii) Methods of assessment of students numerical and communication skills</p> <p>Part of the grade is put for students written participations.</p> <p>About 10 grades are put for the presentation (written and way of presentation)</p> <p>Each log delivered by the student will be objectively evaluated.</p>
e. Psychomotor Skills (if applicable)
<p>(i) Description of the psychomotor skills to be developed and the level of performance required</p> <p>Students are expected to measure different Maths quantities related to the course.</p> <p>Students are expected to prepare small useful projects related to the course.</p>
<p>(ii) Teaching strategies to be used to develop these skills</p> <p>All skills that are required from the student will be performed for the student in the section.</p>
<p>(iii) Methods of assessment of students psychomotor skills</p> <p>Part of the final evaluation will be performed by the supervisor in the section.</p>

5. Schedule of Assessment Tasks for Students During the Semester			
Assessment	Assessment task	Week due	Proportion of Final Assessment
1	First exam	7	20

2	Second exam	13	20
3	Quizzes	During the term	10
4	Exercises	During the term	5
5	Activities	During the exam	5
6	Final written exam		40

D. Student Support

1. Arrangements for availability of teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

Two office hours per day for student consultations and academic advice.

E Learning Resources

1. Required Text(s): Calculus with analytical geometry, Howard Anton, John Wiley & Sons.

2. Essential References

Essential References: Calculus: Early Transcendentals, J. Stewart, Brooks Cole

3- Recommended Books and Reference Material (Journals, Reports, etc) (Attach List)

1. Howard Anton, "Calculus with Analytical geometry" John Wiley & Sons, Latest edition.
2. References: Calculus: Early Transcendentals, J. Stewart, Brooks Cole
3. The first course of calculus for science and engineering students, by Abd Wahid Md Raji et al. 2013.

4- Electronic Materials, Web Sites etc

<http://www.sciencedirect.com>

<http://www.SCOPUS.com>

<http://journals.aip.org>

<http://gateway.ovid.com>

5- Other learning material such as computer-based programs/CD, professional standards/regulations

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Lecture rooms, laboratories, etc.) Lecture rooms
2. Computing resources One computer in the classroom Smart board in the classroom Projector in the classroom
3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list)

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching Asking question before, during and after each lecture. Perform a quiz after each unit. The exams and student participations
2 Other Strategies for Evaluation of Teaching by the Instructor or by the Department Oral and written questions and questioner forms.
3 Processes for Improvement of Teaching Continuous updating of the course content. Looking for more clarifying examples. Continuous assessment of student's acquiring of knowledge and skills.
4. Processes for Verifying Standards of Student Achievement (eg. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution) Discussion of the course objectives, teaching strategies, exams, students learning abilities and achievements, with another colleague in the same field.
5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. Continuous evaluation of the students during the term, and frequent updating of the course content.

MATH 107

Course Specification

Majmaah University
College of Engineering / Department of Basic Engineering Sciences

A. Course Identification and General Information

1. Course title and code: Algebra and Analytical Geometry Math 107
2. Credit hours: 3
3. Program(s) in which the course is offered: college requirement
4. Name of faculty member responsible for the course: Dr. Mukhtar Salah Dr. Tareq Nabeel
5. Year at which this course is offered: freshman year, spring semester
6. Pre-requisites for this course: none
7. Co-requisites for this course: none
8. Location if not on main campus: main campus

B. Objectives

<p>1. Summary of the main learning outcomes for students enrolled in the course.</p> <ul style="list-style-type: none"> • Matrices: introduction and properties • System of linear equations: introduction and method of solving • Determinants and Cramer's rule • Vectors in 2 and 3 dimensions, scalar and vector product • Eigenvalues and eigenvectors: introduction and properties • Partial fractions • Vector valued functions • Directional derivatives • Conic sections • Infinite series: convergence and divergence • Test of convergence: integral, ratio, comparison • Conditional and absolute convergence • Equation of lines and planes in space, Power series
<p>2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)</p> <ul style="list-style-type: none"> • Illustrate to students the use of software packages such as MathCad.

C. Course Description

Course Contents		
N	Short Description	Week
1	Matrices: introduction and properties	1
2	System of linear equations: introduction and method of solving	2,3
3	Determinants and Cramer's rule	4
4	Vectors in 2 and 3 dimensions, scalar and vector product	5,6
5	Eigenvalues and eigenvectors: introduction and properties	7
6	Partial fractions	8
7	Vector valued functions	9
8	Directional derivatives	10
9	Conic sections	11
10	Infinite series: convergence and divergence	12
11	Test of convergence: integral, ratio, comparison	13
12	Conditional and absolute convergence	14
13	Equation of lines and planes in space, Power series	15

1. Course components:				
Lecture: 45	Tutorial: 15	Laboratory: 0	Practical/Field work/Internship: 0	Other: Office hours (30 hours per semester)

2. Additional private study/learning hours expected for students per week. (This should be an average for the semester not a specific requirement in each week): none

<p>3. Development of Learning Outcomes in Domains of Learning</p> <p>For each of the domains of learning shown below indicate:</p> <ul style="list-style-type: none"> • A brief summary of the knowledge or skill the course is intended to develop; • A description of the teaching strategies to be used in the course to develop that knowledge or skill; • The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.
<p>a. Knowledge</p>
<p>(i) Description of the knowledge to be acquired</p> <ul style="list-style-type: none"> • Use matrices in solving Engineering problems • Convert some Engineering problems to linear system and solve it • Partial fraction and it's use • Series, sequences and there convergent.
<p>(ii) Teaching strategies to be used to develop that knowledge</p> <ul style="list-style-type: none"> • Lectures • Exercises • Homework assignments
<p>(iii) Methods of assessment of knowledge acquired</p> <ul style="list-style-type: none"> • Homework assignments • Quizzes • Exams
<p>b. Cognitive Skills</p>
<p>(i) Description of cognitive skills to be developed: the ability to</p> <ul style="list-style-type: none"> • Define the operation on matrices and its applications • Convert a linear system to matrix equation and solve application problems • Give meaning to series and sequences • Define the various types of the conic sections • Scientific thinking through problems solving. • Teams work.
<p>(ii) Teaching strategies to be used to develop these cognitive skills</p> <ol style="list-style-type: none"> a. Classrooms Lectures and discussions through it. b. Solution of numerous Examples during the lecture c. Tutorial
<p>(iii) Methods of assessment of students cognitive skills</p> <ol style="list-style-type: none"> a. Class participation b. Homework assignments c. Computer Lab: MathCad
<p>c. Interpersonal Skills and Responsibility</p>

(i) Description of the interpersonal skills and capacity to carry responsibility to be developed
<ul style="list-style-type: none">a. Work in groups and independentlyb. Manage resources, time and other members of the groupc. Communicate results of work to othersd. Help the student to solve the problem by asking questions during the office hour.
(ii) Teaching strategies to be used to develop these skills and abilities
<ul style="list-style-type: none">• Solve the problems by asking sequential questions,• Conducting group experiments and writing group reports,• Work in groups for solving certain problems.
(iii) Methods of assessment of students interpersonal skills and capacity to carry responsibility
<ul style="list-style-type: none">a. Homework Discussion and Evaluation,b. Assessing communicative Skills.
d. Communication, Information Technology and Numerical Skills
(i) Description of the skills to be developed in this domain:
<ul style="list-style-type: none">• Basic arithmetic operations on matrices• Differentiations
(ii) Teaching strategies to be used to develop these skills
<ul style="list-style-type: none">• Lecture• Exercise
(iii) Methods of assessment of students numerical and communication skills
<ul style="list-style-type: none">• Homework assignments• Quizzes• Exams
e. Psychomotor Skills (if applicable)
(i) Description of the psychomotor skills to be developed and the level of performance required: None
(ii) Teaching strategies to be used to develop these skills
(iii) Methods of assessment of students psychomotor skills

4. Development of Learning Outcomes in Domains of			
Assessment	Assessment task	Week due	Proportion of Final Assessment
1	First Exam	8	20 points
2	Second Exam	15	20 points
3	Quiz and homework assignments	Throughout the semester	20 points
4	Final Exam	Final exams period	40 points

D. Student Support

Arrangements for availability of teaching staff for individual student consultations and academic advice (include amount of time teaching staff are expected to be available each week): weekly office hours

E. Learning Resources

Required Text:
1- Anton, H. and Rorres, C., " Elementary linear algebra: Application version", Wiley, 10 th edition, 2010.
1. 2- Anton, H., " Calculus: Anew Horizon ", Wiley, 6 th edition
2. Essential Reference: Kolman, B. and Hill, D., "Elementary linear algebra with applications", Wiley, 9 th edition, 2007
3. Recommended Books and Reference Material (Journals, Reports, etc): None
4. Electronic Materials, Web Sites etc: None
5. Other learning material such as computer-based programs/CD, professional standards/regulations
• MathCad.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Lecture rooms, laboratories, etc.):
• Classroom
2. Computing resources:
• Computer lab
3. Other resources:
• MathCad.

G. Course Evaluation and Improvement Processes

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching:
• End of semester student evaluation
2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department: None
3. Processes for Improvement of Teaching:
• Student evaluation and course report will be assessed and studied by the department academic committee.
• Any approved changes to the course will appear in the course specification.
4. Processes for Verifying Standards of Student Achievement (eg. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution): None
5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- The course report will be examined by the department academic committee; any recommendations must be approved by the department council and will be introduced to the course specification.

MATH 204

Course Specification

Majmaah University
College of Engineering / Department of Basic Engineering Sciences

A. Course Identification and General Information

1. Course title and code: Math 204
2. Credit hours: 3
3. Program(s) in which the course is offered: college requirement
4. Name of faculty member responsible for the course: Dr. Tarek Nabil Ahmed Dr. Mukhtar Salah
5. Level/year at which this course is offered: sophomore year, fall semester
6. Pre-requisites for this course (if any): Math 106 and Math 107
7. Co-requisites for this course (if any)
8. Location if not on main campus: Faculty of Engineering buildings

B. Objectives

Summary of the main learning outcomes for students enrolled in the course.

1. Resolution of first order and first-degree differential equations: equations with separable variables, homogeneous and non-homogeneous equations, exact and non-exact equations, and linear and non linear equations.
2. Solution of first order differential equations of higher degree and linear second order differential equations, by different methods: direct deduction, comparison theorems, variation of parameters and the inverse differential operator.
3. Use of Laplace transform and Fourier series techniques to solve linear differential equations.
4. Applying various mathematical operations and analyzing its results correctly.

Briefly describe any plans for developing and improving the course that are being implemented.

- a- Add some of the examples (applications) in the science of engineering.
- b- Add some new references.

C. Course Description

1 Topics to be Covered		
	No of Weeks	Contact hours
First order and first degree differential equations: equations with separable variables, homogeneous and non homogeneous equations	2	6
Exact and non-exact equations, linear and non linear equations. The linear first order equations of higher degree	3	9
The linear second order equations: direct deduction, comparison theorems,	3	9
Variation of parameters, and the inverse differential operator. Systems of differential equations	2	6
Series Solutions of Linear Differential equations	2	6
Laplace transform and Fourier Series, their applications to solve linear differential equations,	3	9

2 Course components (total contact hours per semester):

Lecture: 45	Tutorial: 15	Laboratory:-----	Practical/Field work/Internship	Other: Office hours 30 hours (2 hours per week)
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3. Additional private study/learning hours expected for students per week.

3 lectures and 1 hour exercise per week

4. Development of Learning Outcomes in Domains of Learning

For each of the domains of learning shown below indicate:

- A brief summary of the knowledge or skill the course is intended to develop;

<ul style="list-style-type: none"> • A description of the teaching strategies to be used in the course to develop that knowledge or skill; • The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.
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a. Knowledge
<p>(i) Description of the knowledge to be acquired</p> <ul style="list-style-type: none"> a- Resolution of first order and first degree differential equations: equations with separable variables, homogeneous and non homogeneous equations, exact and non exact equations, linear and non linear equations b- Resolution of first order differential equations of higher degree and linear second order differential equations, by different methods: direct deduction, comparison theorems, variation of parameters and the inverse differential operator. c- Use of Laplace transform and Fourier Series techniques to solve linear differential equations.
<p>(ii) Teaching strategies to be used to develop that knowledge</p> <ul style="list-style-type: none"> • Lectures • Exercises • Homework assignments
<p>(iii) Methods of assessment of knowledge acquired</p> <ul style="list-style-type: none"> • Homework assignments • Quizzes • Exams
b. Cognitive Skills
<p>Description of cognitive skills to be developed Each student is expected to prepare a topic related to the course and present it for the whole class. Frequent assignments during the term.</p>
<p>(i) Teaching strategies to be used to develop these cognitive skills</p> <ul style="list-style-type: none"> a. Lectures and discussions through it. b. Solution of numerous examples during the lecture c. Tutorial
<p>(ii) Methods of assessment of students cognitive skills</p> <ul style="list-style-type: none"> a. Class participation b. Homework assignments c. Computer Lab: Mathematical packages
c. Interpersonal Skills and Responsibility
<p>(i) Description of the interpersonal skills and capacity to carry responsibility to be developed</p> <ul style="list-style-type: none"> a. Work in groups and independently b. Manage resources, time and other members of the group c. Communicate results of work to others d. Help the student to solve the problem by asking questions during the office hour.

(ii) Teaching strategies to be used to develop these skills and abilities <ul style="list-style-type: none"> • Solve the problems by asking sequential questions, • Conducting group experiments and writing group reports, • Work in groups for solving certain problems.
(iii) Methods of assessment of students interpersonal skills and capacity to carry responsibility <ul style="list-style-type: none"> a. Homework Discussion and Evaluation, b. Assessing communicative Skills.
d. Communication, Information Technology and Numerical Skills
Description of the skills to be developed in this domain: Encourage students to use internet for searching certain electronic journals regarding topics of the course. Students are required to prepare and present subjects using different educational strategies (PowerPoint presentations,)
(i) Teaching strategies to be used to develop these skills <ul style="list-style-type: none"> • Lecture • Exercise
(ii) Methods of assessment of students numerical and communication skills <ul style="list-style-type: none"> • Homework assignments • Quizzes • Exams
e. Psychomotor Skills (if applicable)
(i) Description of the psychomotor skills to be developed and the level of performance required: None
(ii) Teaching strategies to be used to develop these skills
(iii) Methods of assessment of students psychomotor skills

5. Development of Learning Outcomes in Domains of			
Assessment	Assessment task	Week due	Proportion of Final Assessment
1	First Exam	8	20 points
2	Second Exam	15	20 points
3	Quiz and homework assignments	Throughout the semester	20 points
4	Final Exam	Final exams period	40 points

D. Student Support

Arrangements for availability of teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week): weekly office hours

E. Learning Resources

1. Required Text: Boyce, W and DiPrima, R., Elementary Differential Equations and Boundary Value Problems, Wiley, 9 th edition, 2009.
2. Essential Reference: Kreyszig, E., Kreyszig, H. and Norminton, E. Advanced Engineering Mathematics, Wiley, 10 th edition, 2011.
3. Recommended Books and Reference Material (Journals, Reports, etc): None
4. Electronic Materials, Web Sites etc: None
5. Other learning material such as computer-based programs/CD, professional standards/regulations: none

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Lecture rooms, laboratories, etc.): <ul style="list-style-type: none"> • Classroom
2. Computing resources: <ul style="list-style-type: none"> • Computer lab
3. Other resources (specify -eg. If specific laboratory equipment is required, list requirements or attach list)

G. Course Evaluation and Improvement Processes

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching: <ul style="list-style-type: none"> • End of semester student evaluation
2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department: None
3. Processes for Improvement of Teaching: <ul style="list-style-type: none"> • Student evaluation and course report will be assessed and studied by the department academic committee. • Any approved changes to the course will appear in the course specification.
4. Processes for Verifying Standards of Student Achievement (eg. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution): None
5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. <ul style="list-style-type: none"> • The course report will be examined by the department academic committee; any recommendations must be approved by the department council and will be introduced to the course specification.

MATH 254

Course Specification

Majmaah University
College of Engineering / Department of Basic Engineering Sciences

A. Course Identification and General Information

1. Course title and code: Numerical Analysis Math 254
2. Credit hours: 3
3. Program(s) in which the course is offered: college requirement
4. Name of faculty member responsible for the course: Dr. Mukhtar Salah
5. Year at which this course is offered: junior year, spring semester
6. Pre-requisites for this course: Math 204
7. Co-requisites for this course: none
8. Location if not on main campus: main campus

B. Objectives

Summary of the main learning outcomes for students enrolled in the course.

- Solve algebraic and transcendental equations numerically
- Solve linear system of equations numerically
- Perform a numerical integration
- Perform a numerical differentiation
- Perform Curve fitting of experimental data
- Perform interpolation of a set of data
- Solve ordinary differential equations numerically

Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

- Illustrate to students the use of software packages such as Mathematica 6.0.1 and C++

C. Course Description (Note: General description in the form to be used for the Bulletin or Handbook should be attached)

1. Course Contents		
N	Short Description	Week
1	Mathematical Preliminaries and Error Analysis	1
2	Solution of Equations in One Variable	2
3	Interpolation and Polynomial Approximation	2
4	Direct Method for Solving Linear Systems	2
5	Iterative Techniques in Matrix Algebra	2
6	Approximation Theory	2
7	Numerical Differentiation and Integration	2
8	Initial-Value Problems for Ordinary Differential Equations	1

2. Course components (total contact hours per semester):				
Lecture: 45	Tutorial: 15	Laboratory: 0	Practical/Field work/Internship: 0	Other: Office hours (30 hours per semester)

3. Additional private study/learning hours expected for students per week. (This should be an average for the semester not a specific requirement in each week): none

<p>4. Development of Learning Outcomes in Domains of Learning</p> <p>For each of the domains of learning shown below indicate:</p> <ul style="list-style-type: none"> • A brief summary of the knowledge or skill the course is intended to develop; • A description of the teaching strategies to be used in the course to develop that knowledge or skill; • The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.
<p>a. Knowledge</p>
<p>(i) Description of the knowledge to be acquired</p> <ul style="list-style-type: none"> • Cover the common numerical methods for solving algebraic and transcendental equations • Cover the methods of Solving linear system of equations • Cover the common methods used for interpolation • Cover the common methods of Curve fitting • Cover the common methods of solving ordinary differential equations
<p>(ii) Teaching strategies to be used to develop that knowledge</p> <ul style="list-style-type: none"> • Lectures • Exercises • Homework assignments
<p>(iii) Methods of assessment of knowledge acquired</p> <ul style="list-style-type: none"> • Homework assignments • Quizzes • Exams
<p>b. Cognitive Skills</p>
<p>(i) Description of cognitive skills to be developed: the ability to</p> <ul style="list-style-type: none"> • Scientific thinking through problems solving. • Teams work.
<p>(ii) Teaching strategies to be used to develop these cognitive skills</p> <ol style="list-style-type: none"> a. Classrooms Lectures and discussions through it. b. Solution of numerous Examples during the lecture c. Tutorial
<p>(iii) Methods of assessment of students cognitive skills</p> <ol style="list-style-type: none"> a. Class participation b. Homework assignments c. Computer Lab: Excel and Minitab software reports.
<p>c. Interpersonal Skills and Responsibility</p>
<p>(i) Description of the interpersonal skills and capacity to carry responsibility to be developed</p> <ol style="list-style-type: none"> a. Work in groups and independently b. Manage resources, time and other members of the group c. Communicate results of work to others

d. Help the student to solve the problem by asking questions during the office hour.
(ii) Teaching strategies to be used to develop these skills and abilities <ul style="list-style-type: none"> • Solve the problems by asking sequential questions, • Conducting group experiments and writing group reports, • Work in groups for solving certain problems.
(iii) Methods of assessment of students interpersonal skills and capacity to carry responsibility <ul style="list-style-type: none"> a. Homework discussion and evaluation, b. Assessing communicative skills.
d. Communication, Information Technology and Numerical Skills
(i) Description of the skills to be developed in this domain: <ul style="list-style-type: none"> • Basic arithmetic operations • Integration and differentiation
(ii) Teaching strategies to be used to develop these skills <ul style="list-style-type: none"> • Lecture • Exercise
(iii) Methods of assessment of students numerical and communication skills <ul style="list-style-type: none"> • Homework assignments • Quizzes • Exams
e. Psychomotor Skills (if applicable)
(i) Description of the psychomotor skills to be developed and the level of performance required: None
(ii) Teaching strategies to be used to develop these skills
(iii) Methods of assessment of students psychomotor skills

5. Development of Learning Outcomes in Domains of			
Assessment	Assessment task	Week due	Proportion of Final Assessment
1	First Exam	8	20 points
2	Second Exam	15	20 points
3	Quiz and homework assignments	Throughout the semester	20 points
4	Final Exam	Final exams period	40 points

D. Student Support

Arrangements for availability of teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week): weekly office hours

E. Learning Resources

1. Required Text: Burden, R. L., and Faries, J. D, <i>Numerical Analysis</i> , 9 th edition. Brooks/Cole Cengage Learning, 2011.
2. Essential Reference: Steven Chapra and Raymond Canale, <i>Numerical Methods for Engineers</i> , 6 nd edition. McGraw Hill, 2010.
3. Recommended Books and Reference Material (Journals, Reports, etc): None
4. Electronic Materials, Web Sites etc: None
5. Other learning material such as computer-based programs/CD, professional standards/regulations <ul style="list-style-type: none"> • Mathematica 6.0.1 • C++

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Lecture rooms, laboratories, etc.): <ul style="list-style-type: none"> • Classroom
2. Computing resources: <ul style="list-style-type: none"> • Computer lab
3. Other resources (specify -eg. If specific laboratory equipment is required, list requirements or attach list) <ul style="list-style-type: none"> • Mathematica 6.0.1 • C++

G. Course Evaluation and Improvement Processes

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching: <ul style="list-style-type: none"> • End of semester student evaluation
2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department: None
3. Processes for Improvement of Teaching: <ul style="list-style-type: none"> • Student evaluation and course report will be assessed and studied by the department academic committee. • Any approved changes to the course will appear in the course specification.
4. Processes for Verifying Standards of Student Achievement (eg. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution): None
5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. <ul style="list-style-type: none"> • The course report will be examined by the department academic committee; any recommendations must be approved by the department council and will be introduced to the course specification.

PHY 103

Course Specification

Majmaah University
College of Engineering / Basic Engineering Sciences Department

A. Course Identification and General Information

1. Course title and code: General Physics PHY 103
2. Credit hours: 4
3. Program(s) in which the course is offered: college requirement
4. Name of faculty member responsible for the course:
5. Year at which this course is offered: freshman year, fall semester
6. Pre-requisites for this course: none
7. Co-requisites for this course: none
8. Location if not on main campus: main campus

B. Objectives

Summary of the main learning outcomes for students enrolled in the course.
The goal of this course is to provide the student with fundamentals and basic physical concepts which directly related to the engineering sciences. The main learning outcomes for students include:

- Distinguish between different wave motions like sound and light.
- Employing wave equations in different applications.
- Application of thermodynamics relations on some physical concepts.
- Identification of the properties of light and its applications.
- Constructing an electric circuit using basic circuit elements.
- Training on the correct method for thinking and solving simple and complicated problems.

Briefly describe any plans for developing and improving the course that are being implemented. (eg increased use of IT or web based reference material, changes in content as a result of new research in the field)

- Continuous updating of the information, knowledge and skills included in the course through continuous search for new knowledge and skills available in recent publications (references, books, researches, magazines, internet...).
- Verifying the information resources.
- Continuous evaluation of the course content, student level, and develop plans accordingly.

C. Course Description (Note: General description in the form to be used for the Bulletin or Handbook should be attached)

1. Topics to be Covered		
List of Topics	No of Weeks	Contact hours
Wave Motion: Propagation of a Disturbance, Traveling Wave, The Speed of Waves on Strings, Reflection and Transmission, Rate of Energy Transfer by Sinusoidal Waves on Strings, The Linear Wave Equation.	2	6
Sound Waves: Pressure Variations in Sound Waves, Speed of Sound Waves, Intensity of Periodic Sound Waves, The Doppler Effect.	2	6
The Nature of Light and the Principles of Ray Optics: The Nature of Light, Measurements of the Speed of Light, The Ray Approximation in Ray Optics, Wave Under Reflection, Wave Under Refraction, Total Internal Reflection.	1	3
Wave Optics: Young's Double-Slit Experiment, Waves in Interference, Intensity Distribution of the Double-Slit Interference Pattern, Change of Phase Due to Reflection, Interference in Thin Films.	2	6
Diffraction Patterns and Polarization: Diffraction Patterns from Narrow Slits, The Diffraction Grating, Polarization of Light Waves.	1	3
Thermodynamics: Temperature, Thermometers and the Celsius Temperature Scale, The Constant-Volume Gas Thermometer and the Absolute Temperature Scale, Thermal Expansion of Solids and Liquids, Macroscopic Description of an Ideal Gas.	1	3
The First Law of Thermodynamics: Heat and Internal Energy, Specific Heat and Calorimetry, Latent Heat, Work and Heat in Thermodynamic Processes, The First Law of Thermodynamics, Some Applications of the First Law of	2	6

Thermodynamics.		
Current and Resistance: Electric Current, Resistance, A Model for Electrical Conduction, Resistance and Temperature, Superconductors, Electrical Power.	1	3
Direct-Current Circuits: Electromotive Force, Resistors in Series and Parallel, Kirchhoff's Rules, RC Circuits, Household Wiring and Electrical Safety.	2	6

2. Course components (total contact hours per semester):				
Lecture: 45	Tutorial: 16	Laboratory: 32	Practical/Field work/Internship	Other: Office hours 64 hours (4 hours per week)

3. Additional private study/learning hours expected for students per week. (This should be an average for the semester not a specific requirement in each week)

<p>4. Development of Learning Outcomes in Domains of Learning</p> <p>For each of the domains of learning shown below indicate:</p> <ul style="list-style-type: none"> • A brief summary of the knowledge or skill the course is intended to develop; • A description of the teaching strategies to be used in the course to develop that knowledge or skill; • The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.
<p>a. Knowledge</p>
<p>(i) Description of the knowledge to be acquired</p> <ul style="list-style-type: none"> • Knowing the different scales and measurements of heat. • Learning the basic concepts of thermodynamics. • Mastering the nature of waves and its properties. • Learning the basic concepts that describe sound waves. • Understanding the nature of light and its properties. • Learning the basic concepts of electric circuits. • Knowing basic Electric circuit elements.
<p>(ii) Teaching strategies to be used to develop that knowledge</p> <ul style="list-style-type: none"> • Lectures using power point presentations, smart board, and projectors. • Discussions. • Handout of lecture notes for each topic.

(iii) Methods of assessment of knowledge acquired

- Continuous feedback, oral.
- Quizzes.
- Major exams and final exam.

b. Cognitive Skills

(i) Description of cognitive skills to be developed

- Each student is expected to prepare a topic related to the course and present it for the whole class.
- Frequent assignments during the term.

(ii) Teaching strategies to be used to develop these cognitive skills

- Topics are to be selected by the lecturer, then to be distributed for the students, and each student is to prepare the material for each topic and to present it for the whole class.
- Students are required to deliver a summary for some topics related to the course.

(iii) Methods of assessment of students cognitive skills

- Evaluation of the topics prepared by students according to the content, arrangement, and covering of the topic.
- Evaluation of the student presentation according to certain criteria.
- Evaluation of the student preparations.

c. Interpersonal Skills and Responsibility

(i) Description of the interpersonal skills and capacity to carry responsibility to be developed

- Students are expected to develop certain teamwork activities regarding the theoretical part.
- Students are distributed into groups in the physics lab; each group has to work in harmony and has certain responsibilities.

(ii) Teaching strategies to be used to develop these skills and abilities

- Part of some lectures will be specified for group discussions. At least students will be distributed into groups once monthly for discussing certain issues in the theoretical part.
- Students will undergo physics experiments as groups in the physics lab.

<p>(iii) Methods of assessment of students interpersonal skills and capacity to carry responsibility</p> <ul style="list-style-type: none"> • Observe students during their interactions and discuss with them their point of view regarding the issues under discussion. • Evaluating students interactions in the lab as well as in the classroom.
<p>d. Communication, Information Technology and Numerical Skills</p>
<p>(i) Description of the skills to be developed in this domain.</p> <ul style="list-style-type: none"> • Encourage students to use internet for searching certain electronic journals regarding topics of the course. • Students are required to prepare and present subjects using different educational strategies (power point presentations,).
<p>(ii) Teaching strategies to be used to develop these skills</p> <ul style="list-style-type: none"> • Students will be asked for delivering a summary regarding certain topics related to the course. • Each student is expected to prepare and present one issue regarding to the course for about 15 minutes. • At the end of each week, students are to submit a log regarding their practice in that week.
<p>(iii) Methods of assessment of students numerical and communication skills</p> <ul style="list-style-type: none"> • Part of the grade is put for students written participations. • About 10 grades are put for the presentation (written and way of presentation) • Each log delivered by the student will be objectively evaluated.
<p>e. Psychomotor Skills (if applicable)</p>
<p>(i) Description of the psychomotor skills to be developed and the level of performance required</p> <ul style="list-style-type: none"> • Students are expected to measure different physical quantities related to the course. • Students are expected to prepare small useful projects related to the course.
<p>(ii) Teaching strategies to be used to develop these skills</p> <p>All skills that are required from the student will be performed for the student in the lab.</p>

(iii) Methods of assessment of students psychomotor skills

Part of the final evaluation will be performed by the supervisor in the physics lab.

5. Development of Learning Outcomes in Domains of

Assessment	Assessment task	Week due	Proportion of Final Assessment
1	First exam	7	20
2	Second exam	13	20
3	Lab	During the term	10
4	Exercises	During the term	5
5	Quizzes	During the term	5
6	Final written exam	End of semester	40

D. Student Support

1. Arrangements for availability of teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

Two office hours per day for student consultations and academic advice.

E. Learning Resources

1. Required Text(s)

Physics for Scientists and Engineers, Raymond A. Serway and John W. Jewett, Thomson Brooks/Cole, 2010; 8th Edition.

2. Essential References

Fundamental of Physics by Halliday & Resnick, John Wiley & Sons, 2008.

3. Recommended Books and Reference Material (Journals, Reports, etc) (Attach List)

Schaum's Outline of College Physics, F. J. Bueche and E. Hechet, McGraw-Hill, 1997.

4. Electronic Materials, Web Sites etc

<http://science.pppst.com/physics.html>

<http://physwiki.ucdavis.edu>

<http://www.physics.org>

<http://www.physicsclassroom.com/>

<http://www.phys4arab.net/>

5. Other learning material such as computer-based programs/CD, professional standards/regulations
 - Crocodile Physics: a powerful simulator that lets you model a range of electricity, motion and forces, optics and waves.
 - Electronic Work Bench: is used for circuit simulation in electronics labs. The software allows the students to quickly verify the operation of an analog or digital electronic circuits.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Lecture rooms, laboratories, etc.)
 - Lecture rooms.
 - Physics laboratory.
2. Computing resources
 - One computer in the Lecture rooms, and another in the lab.
 - Smart board. (In both Lecture rooms and lab)
 - Data show. (In both Lecture rooms and lab)
3. Other resources (specify -eg. If specific laboratory equipment is required, list requirements or attach list)

G. Course Evaluation and Improvement Processes

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching
 - Asking question before, during and after each lecture.
 - Perform a quiz after each unit.
 - The exams and student participations.
2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department

Oral and written questions and questioner forms.
3. Processes for Improvement of Teaching
 - Continuous updating of the course content.
 - Looking for more clarifying examples.
 - Continuous assessment of student's acquiring of knowledge and skills.

4. Processes for Verifying Standards of Student Achievement (eg. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

Discussion of the course objectives, teaching strategies, exams, students learning abilities and achievements, with another colleague in the same field.

5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

Continuous evaluation of the students during the term, and frequent updating of the course content.

GE 105

Course Specification

Majmaah University
College of Engineering / Department of Basic Engineering Sciences

A. Course Identification and General Information

1. Course title and code: Engineering Chemistry GE 105
2. Credit hours: 3
3. Program(s) in which the course is offered: college requirement
4. Name of faculty member responsible for the course: Dr. Mohammad Kashif Uddin
5. Year at which this course is offered: freshman year, spring semester
6. Pre-requisites for this course: none
7. Co-requisites for this course: none
8. Location if not on main campus: main campus

B. Objectives

Summary of the main learning outcomes for students enrolled in the course.

The goal of this course is to provide the student with fundamentals and basic chemical engineering concepts which directly related to the engineering sciences. the main learning outcomes for students includes :

1. Ability to apply mathematics, science and engineering principles.
2. Ability to design and conduct experiments, analyze and interpret data.
3. An ability to use the techniques, skills to solve engineering problems and for professional engineering practice.
4. An ability to communicate effectively.
5. The broad education necessary to understand the impact of engineering solutions in a global and societal context.

Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

- Continuous updating of the information, knowledge and skills included in the course through continuous search for new knowledge and skills available in recent publications (references, books, researches, magazines, internet...).
- Verifying the information resources.
- Continuous evaluation of the course content, student level to develop plans accordingly.

C. Course Description (Note: General description in the form to be used for the Bulletin or Handbook should be attached)

1. Topics to be Covered		
List of Topics	No of Weeks	Contact hours
<u>Fundamentals of Chemistry</u> : Stoichiometry, Atomic structure, Chemical bonding, Chemical kinetics, Chemical equilibrium and Fundamentals of organic chemistry.	4	12
<u>Materials Science</u> : Introduction to materials science. Metals, building materials, Steel, Aluminum, Corrosion and corrosion resistance.	2	6
<u>Non-metallic Materials</u> : Polymers- structure, physical properties and applications of polymers. High performance ceramics and glasses. Chemistry of cement.	2	6
<u>Electrochemistry</u> : Electrical conduction, basic theories of metallic and electrolytic conduction. Electrolytic cells, Electrodes and standard electrode potentials. Electronic materials and semiconductor properties.	2	6
<u>Fuel and petrochemicals</u> : Coal, oil and natural gas. Petrochemical industry	1	3

2. Course components (total contact hours per semester):				
Lecture: 45	Tutorial: 15	Laboratory: 0	Practical/Field work/Internship: 0	Other: 0

3. Additional private study/learning hours expected for students per week. (This should be an average for the semester not a specific requirement in each week): none

4. Development of Learning Outcomes in Domains of Learning	
For each of the domains of learning shown below indicate:	
<ul style="list-style-type: none"> • A brief summary of the knowledge or skill the course is intended to develop; • A description of the teaching strategies to be used in the course to develop that knowledge or skill; • The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned. 	
a. Knowledge	
(i) Description of the knowledge to be acquired	
<ul style="list-style-type: none"> • Learning the basic concepts and fundamentals of Engineering Chemistry. • Understanding the basic terms and laws of chemical thermodynamics. • Learning about gas laws and states of matter. • Understanding the nature of chemical equilibrium and its properties. • Knowing about Electrochemistry. • Knowing basic Materials Science, Fuel and petrochemical industry concepts. 	
(ii) Teaching strategies to be used to develop that knowledge	
<ul style="list-style-type: none"> • Lectures using power point presentations, smart board, and projectors. • To listen the students problem and resolve it • Discussions • Handout of lecture notes for each topic. 	
(iii) Methods of assessment of knowledge acquired	
<ul style="list-style-type: none"> • Continuous feedback, oral questions during class. • Homework, Quizzes. • Major exams and final exam. 	
b. Cognitive Skills	
(i) Description of cognitive skills to be developed: the ability to	
<ul style="list-style-type: none"> • Each student is expected to prepare a topic related to the course and present it for the whole class. • Frequent assignments during the term. 	

(ii) Teaching strategies to be used to develop these cognitive skills

- Topics are to be selected by the lecturer, then to be distributed for the students, and each student is to prepare the material for each topic and to present it for the whole class.
- Students are required to deliver a summary for some topics related to the course.

(iii) Methods of assessment of students cognitive skills

- Evaluation of the topics prepared by students as according to the contents, arrangement and covering of the topics.
- Evaluation of the student's preparation.
- Also encouraged and appreciated the student's curiosity and questions, who thought beyond the scope of topic.

c. Interpersonal Skills and Responsibility

(i) Description of the interpersonal skills and capacity to carry responsibility to be developed

- Students are expected to develop certain team work activities.
- They involved communication ability with others, confidence, listen and understand problem solving, decision making abilities.
- Perceive as more calm, confident and charismatic, qualities that are often endearing or appealing to others.
- Being more aware of interpersonal skills can help you improve and develop them.
- Provide an extensive library of articles to help the student learn and improve interpersonal skills.

(ii) Teaching strategies to be used to develop these skills and abilities

- Encourage students to engage in communication use appropriate questioning to develop understanding among each other.
- In certain phases of class the students should be given small individual tasks which make students focus on the topic (problem).
- Sometimes it is possible to organize a debate (discussion) about a certain topic. This is especially convenient where there are different approaches to a topic, i.e. different views and methodologies.
- Homework and quizzes is always be a good strategy to analyze their growth.

(iii) Methods of assessment of students interpersonal skills and capacity to carry responsibility

- Observe students during their interactions and discuss with them their point of view regarding the issues and problems related to the course.

<ul style="list-style-type: none"> Evaluating students performance in the classroom.
d. Communication, Information Technology and Numerical Skills
(i) Description of the skills to be developed in this domain: <ul style="list-style-type: none"> Encourage students to use internet for searching certain electronic journals regarding topics of the course. Students are required to prepare and present subjects using different educational strategies (power point presentations,) Use the electronic material from various web resources related to this course
(ii) Teaching strategies to be used to develop these skills <ul style="list-style-type: none"> Students will be asked for delivering a basic summary regarding certain topics related to the course. To teach the certain topic again and again with extra time with those students who have the problem in understanding the topic. Give the different types of questions for each student so that they can be able to imply the rules and get the results.
(iii) Methods of assessment of students numerical and communication skills <ul style="list-style-type: none"> Clearing the methods and rules to solve the numerical Part of the grade is put for students written participations. Each log delivered by the student will be objectively evaluated. Quizzes and exams
e. Psychomotor Skills (if applicable)
(i) Description of the psychomotor skills to be developed and the level of performance required: None
(ii) Teaching strategies to be used to develop these skills
(iii) Methods of assessment of students psychomotor skills

5. Development of Learning Outcomes in Domains of			
Assessment	Assessment task	Week due	Proportion of Final Assessment
1	First exam	7	20
2	Second exam	13	20
3	Quizzes, Homework	During the term	15
4	Exercises	During the term	5
5	Final written exam		40

D. Student Support

Arrangements for availability of teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week): weekly office hours

- Two office hours per day for student consultations and academic advice.

E. Learning Resources

1. Required Text(s) Text Book: 1. General Chemistry, Atoms First, <i>John McMurry, Robert C. Fay</i> , 4 th . Ed. Prentice Hall, February 2009. 2. Engineering Chemistry, Extended Edition, Wiley India, ISBN: 9788126536337
2. Essential Reference: Engineering Chemistry, P.R.Vijayasathy, 2 th . Ed. EasternEconomy.
3. Recommended Books and Reference Material (Journals, Reports, etc): Schaum's Outline Bigining Chemistry, David E. Goldberg, PhD, McGraw-Hill, 1997.
4. Electronic Materials, Web Sites etc: http://science.pppst.com/chemistry.html http://www.sciencegeek.net/Chemistry/Powerpoints2.shtml http://www.chem1.com/chemed/genchem.shtml http://www.wiredchemist.com/chemistry/instructional/intro_chem_contents.html http://chemwiki.ucdavis.edu/Wikitexts http://www.chem1.com/acad/webtext/virtualtextbook.html http://wiki.chemeddl.org/index.php/Collections:Texts:Chemistry
5. Other learning material such as computer-based programs/CD, professional standards/regulations

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Lecture rooms, laboratories, etc.): • Classroom, Experimental labs, New dusters for white boards
2. Computing resources: • Computer lab, One computer in the lecture room
3. Other resources (specify -eg. If specific laboratory equipment is required, list requirements or attach list)

- MS Excel
- Minitab

G. Course Evaluation and Improvement Processes

<p>1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching:</p> <ul style="list-style-type: none"> • End of semester student evaluation • Asking question before, during and after each lecture. • Perform a quiz after each unit. • The exams and student participations. • Focus group discussion with small group of students.
<p>2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department: None</p>
<p>3. Processes for Improvement of Teaching:</p> <ul style="list-style-type: none"> • Continuous updating of the course content. • Looking for more clarifying examples. • Continuous assessment of student's acquiring of knowledge and skills.
<p>4. Processes for Verifying Standards of Student Achievement (eg. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution):</p> <ul style="list-style-type: none"> • Discussion of the course objectives, teaching strategies, exams, students learning abilities and achievements, with another colleague in the same field.
<p>5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.</p> <ul style="list-style-type: none"> • The course report will be examined by the department academic committee; any recommendations must be approved by the department council and will be introduced to the course specification. • Continuous evaluation of the students during the term, and frequent updating of the course content.

GE 306

Course Specification

Majmaah University
College of Engineering / Department of Basic Engineering Sciences

A. Course Identification and General Information

Course title and code: Engineering Technical Writing GE 306
1. Credit hours: 2
2. Program(s) in which the course is offered: college requirement
3. Name of faculty member responsible for the course: Dr. C. Raza Mirza
4. Year at which this course is offered: junior year, fall semester
5. Pre-requisites for this course: STAT 201
6. Co-requisites for this course: none
7. Location if not on main campus: Main Campus

B. Objectives

Summary of the main learning outcomes for students enrolled in the course.
<ul style="list-style-type: none"> • Students should be able to write a technical report that is both efficient and comprehensive • Students should learn how to write problems, express their thoughts and make problems and results analysis • Students should be able to write technical reports in a clear and correct manner in terms of grammar and standard reports parts • Students should learn how to write a problem statement report in a top down manner or in a task oriented manner
Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)
<ul style="list-style-type: none"> • None

C. Course Description

1. Topics to be Covered		
List of Topics	No of Weeks	Contact hours
Teach different types of reports and their purposes by examples	1,2	8
Explain the full length technical report structure and the purpose of each section	3,4	8
Explain the structure of Cover page and selection criteria of report title	5	4
Explain the structure of Abstract and writing criteria with examples	6	4
Explain the structure of Acknowledgement, Table of Contents, List of Tables, Figure, Nomenclature, Acronyms and their writing criteria	7,8	8
Explain the structure of Introduction, hypothesis , Body of report, their results and conclusions, references and their writing criteria with exercises	9,10,11	12
Final project report (written in a specified format) training and drafting	12,13,14,15	16

2. Course components (total contact hours per semester):				
Lecture: 30	Tutorial: 0	Laboratory: 0	Practical/Field work/Internship: 0	Other: 0

3. Additional private study/learning hours expected for students per week. (This should be an average for the semester not a specific requirement in each week): None

<p>4. Development of Learning Outcomes in Domains of Learning</p> <p>For each of the domains of learning shown below indicate:</p> <ul style="list-style-type: none"> • A brief summary of the knowledge or skill the course is intended to develop; • A description of the teaching strategies to be used in the course to develop that knowledge or skill; • The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.
<p>a. Knowledge</p>
<p>(i) Description of the knowledge to be acquired</p> <ul style="list-style-type: none"> • Understanding of the types and purposes of technical reports • Organization of reports and plan the sections and subsections you need. • Fully understanding of the steps in writing a report • Write up of clear and concise technical reports • Clear understanding of principles of clear and concise writing • How to identify technical problems and their solutions • How to collect, organize, analyze and evaluate information • How to keep technical terms to a minimum – avoiding jargon, acronyms and abbreviations • Best ways to transfer technical information into graphs, flowcharts and tables • How to translate technical documents into compelling oral presentations
<p>(ii) Teaching strategies to be used to develop that knowledge</p> <ul style="list-style-type: none"> • Lectures • Exercises • Homework assignments
<p>(iii) Methods of assessment of knowledge acquired</p> <ul style="list-style-type: none"> • Homework assignments • Quizzes • Report writing
<p>b. Cognitive Skills</p>
<p>(i) Description of cognitive skills to be developed: the ability to None</p>
<p>(ii) Teaching strategies to be used to develop these cognitive skills</p>
<p>(iii) Methods of assessment of students cognitive skills</p>
<p>c. Interpersonal Skills and Responsibility</p>
<p>(i) Description of the interpersonal skills and capacity to carry responsibility to be developed</p>

None
(ii) Teaching strategies to be used to develop these skills and abilities
(iii) Methods of assessment of students interpersonal skills and capacity to carry responsibility
d. Communication, Information Technology and Numerical Skills
(i) Description of the skills to be developed in this domain: None
(ii) Teaching strategies to be used to develop these skills
(iii) Methods of assessment of students numerical and communication skills
e. Psychomotor Skills (if applicable)
(i) Description of the psychomotor skills to be developed and the level of performance required: None
(ii) Teaching strategies to be used to develop these skills
(iii) Methods of assessment of students psychomotor skills

5. Development of Learning Outcomes in Domains of		
Assessment	Assessment task (e.g. essay, test, group project, examination etc.)	Proportion of Final Assessment
1	Weekly reports with introducing an engineering problem	10%
2	Weekly reports with problem factor analysis and results presentation	10%
3	Monthly reports with different sections introduction background and Problem statement	20%
4	Monthly reports with presentation tools in a top down approach (outline, introduction, background)	20%
5	Final project report (written in a specified format)	20%
6	Final presentation along with discussion of literature data	20%

D. Student Support

Arrangements for availability of teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week): weekly office hours

E. Learning Resources

<ul style="list-style-type: none"> A Guide to Writing as an Engineer, David Beer and David McMurrey, Wiley 4th edition Engineering Report Writing, John, F. Brown, United Western Pr.
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F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Lecture rooms, laboratories, etc.): • Classroom
2. Computing resources: N/A
3. Other resources (specify -eg. If specific laboratory equipment is required, list requirements or attach list) None

G. Course Evaluation and Improvement Processes

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching: • End of semester student evaluation
2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department: None
3. Processes for Improvement of Teaching: • Student evaluation and course report will be assessed and studied by the department academic committee. • Any approved changes to the course will appear in the course specification.
4. Processes for Verifying Standards of Student Achievement (eg. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution): None
5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. • The course report will be examined by the department academic committee; any recommendations must be approved by the department council and will be introduced to the course specification.

GE 407

Course Specifications

Institution: Majmaah University	Date of Report: March 4, 2015
College/Department: College of Engineering	

A- Course Identification and General Information

1. Course title and code: Engineering Economics GE 407		
2. Credit hours: 2		
3. Program(s) in which the course is offered: College requirement		
4. Name of faculty member responsible for the course:		
5. Level/year at which this course is offered: Senior year		
6. Pre-requisites for this course: None		
7. Co-requisites for this course: None		
8. Location: main campus		
9. Mode of Instruction (mark all that apply)		
a. Traditional classroom	<input checked="" type="checkbox"/> What percentage?	<input type="text" value="90"/>
b. Blended (traditional and online)	<input checked="" type="checkbox"/> What percentage?	<input type="text" value="5"/>
c. e-learning	<input checked="" type="checkbox"/> What percentage?	<input type="text" value="5"/>
d. Correspondence	<input type="checkbox"/> What percentage?	<input type="text"/>
f. Other	<input type="checkbox"/> What percentage?	<input type="text"/>
Comments:		

B- Objectives

1. What is the main purpose for this course?

Introduction to engineering economy, the time value of money, analysis of break-even point (BEP), assessment of the benefit/cost, decision-making and the choice between alternatives, laws of return and the effective rate of return (ERR), economic analysis, replacement policy, depreciation rates, fundamentals of inflation, introduction to cost accounting

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

Using built-in functions in Excel such as FV, IRR, NPV, PMT, PV.

C- Course Description

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
Introduction to engineering economic decision, time value of money, cash flow diagram	2	4
Interest rate, economic equivalence	3	6
Present worth analysis	2	4
Annual cash flow analysis	1	2
Rate of return analysis	1	2
Project uncertainty	2	4
Replacement decision and benefit-cost analysis	2	4
Inflation and price change	1	2
Cost accounting	1	2

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	30	15				45
Credit	02					

3. Additional private study/learning hours expected for students per week.

02

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	Knowledge		
1.1	Learning of economic equivalence	Emphasis on hand on practice based learning	Conducting quizzes, home work
1.2	Cost benefit analysis	Examples of real life problems are discussed to create interest	Term exams and final exams
1.2	Project uncertainties, accounting and inflation	Interactive teaching learning and exercises	Performance in exercises
2.0	Cognitive Skills		
2.1	Recognizing the applicability of economic principles in the field of engineering	Solving real life economic problems	Examinations
2.2	Solving complex economic problem	Involving students to solve descriptive problems during exercise sessions	Assignments, Final, and term exams
3.0	Interpersonal Skills & Responsibility		
3.1	Collecting necessary data and applying economic principles for a project	Allocating group based assignment	Evaluation of report
3.2	Participating in group discussions	Interactive teaching learning session	Performance in discussions
4.0	Communication, Information Technology, Numerical		
4.1	Defending the results and analysis of the assigned economic problem	Individual presentation	Assessing oral presentation and submitted document
4.2	Application of IT tools in solving the economic problem	Use of MS Excel built function	The correctness of formulation, codes and functions used in MS excel spread sheet
5.0	Psychomotor		
5.1			
5.2			

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task	Week Due	Proportion of Total Assessment
1	First Major Exam	8th	20
2	Second Major Exam	12th	20
3	Final Exam	Final exam week	40
4	Quiz	7th and 11th week	10
5	Homework assignments	9th an 13th week	10

D- Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)	
a- Weekly office hours	1hrs
b- Meetings and discussions on Blackboard/D2L	1hr

E- Learning Resources

1. List Required Textbooks 1. Newnan, Eschenbach, Lavelle, Engineering Economic Analysis, 11 th edition, 2011, Oxford University Press
2. List Essential References Materials (Journals, Reports, etc.)
3. List Recommended Textbooks and Reference Material (Journals, Reports, etc) a. Leland Blank, P.E., and Anthony Tarquin, P.E., “Engineering Economy”, McGraw-Hill, 6 Ed., 2005 b. Sullivan, W. G., Bontadelli, J. A. and Wicks, E. M., “Engineering Economy”, 11th ed., Prentice Hall, Upper Saddle River, New Jersey, 2001.
4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.) a. Wikipedia b. youtube
5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

F- Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) a- Classroom b- Computer laboratory
2. Computing resources (AV, projector, Smart board, software, etc.) Projector
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) NO

G- Course Evaluation and Improvement Processes

<p>1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching</p> <p>Course Evaluation Survey filled by students</p>
<p>2. Other Strategies for Evaluation of Teaching by the Program/Department Instructor</p> <p>Faculty Peer Assessment</p>
<p>3. Processes for Improvement of Teaching</p> <ol style="list-style-type: none">1. Plan: The instructor will develop a strategy for teaching.2. Do: The strategy will be implemented for one semester.3. Study: The experiences of the students will be collected through a survey.4. Act: Effective teaching strategies will be implemented and revised as more experiences are gained.
<p>4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)</p> <p>Samples of student works will be reviewed by another instructor assigned by the department.</p>
<p>5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.</p> <p>The Improvement Loop details the steps of course and program improvement. The course reports will be reviewed every two years by the Course Report Committee and the recommendations will be passed to the department council for review and possible adaptation.</p>

GE 408

Course Specifications

Institution: College of Engineering	Date of Report: 5/5/2014
College/Department : Engineering/ Civil and Environmental Engineering	

A. Course Identification and General Information

1. Course title and code: Engineering Project Management GE 408			
2. Credit hours: 2 (2,1,0)			
3. Program(s) in which the course is offered. college requirement			
4. Name of faculty member responsible for the course Dr. Abdullah Mohammed Alshehri			
5. Level/year at which this course is offered: senior year, spring semester			
9. 6. Pre-requisites for this course (if any): None			
7. Co-requisites for this course (if any): None			
8. Location if not on main campus			
9. Mode of Instruction (mark all that apply)			
a. Traditional classroom	<input checked="" type="checkbox"/>	What percentage?	<input type="text" value="90"/>
b. Blended (traditional and online)	<input type="checkbox"/>	What percentage?	<input type="text"/>
c. e-learning	<input type="checkbox"/>	What percentage?	<input type="text"/>
d. Correspondence	<input type="checkbox"/>	What percentage?	<input type="text"/>
f. Other	<input checked="" type="checkbox"/>	What percentage?	<input type="text" value="10"/>
Comments:			
The course involves exercises and laboratory parts, teaching these two parts depends on explaining, reports, home works and assignments.			

B Objectives

<p>1. What is the main purpose for this course?</p> <p>The purpose of this course is to familiarize students with some of the project management concepts and principles. Students will gain as result a sound understanding to deal with the management challenging associated with complexity nature of the large projects and that by providing related topics of how projects can be managed more effectively. The course address not special focuses on one type of project but basic nature of managing general projects. It is also provide topics of how projects can be managed under tight schedules and limited resources. The students to assimilate the course knowledge will apply relevant tools and techniques taken in the class by simulation exercises using examples of project case studies.</p>
<p>2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)</p> <ul style="list-style-type: none"> • Solving problems through assignments and tutorials on each topic. • Emphasis on understanding concepts and illustrating applications to problems. • Written notes are provided, in addition to reference and power point presentations. • Emphasis in classroom is on understanding concepts. • Placing before the class mind provoking and thinking questions.

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered		
List of Topics	No. of Weeks	Contact Hours
Introduction to Project Management	1	2
Project Planning	2	4
Project Scheduling	1	4
Exam 1	1	1:30
Network Scheduling Technique	1	1:30
Activity-On-Arrow (AOA): Using Critical Path method (CPM)	2	10
Using Program Evolution & Review Technique (PERT)	1	5
Exam 2	1	1:30
Scheduling Resources (Resource Leveling and Allocation)	2	10
Time-Cost Trade Off (Crashing a Schedule)	1	5
Project Controlling	1	2
Risk Monitoring and Control	1	2
Project Management Computer Applications	1	2
Total	16	51

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	2	1	0			3
Credit	2	1	0			3

10. Additional private study/learning hours expected for students per week.
3-4 hours per week on an average for self-study and problem solving

2-3

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	Knowledge		
1.1	Development of an engineering project plan.	<ul style="list-style-type: none"> - Course delivery by citing real life examples and problems. - Emphasis on understanding concepts and illustrating applications to problems. - Placing before the class mind provoking and thinking questions. 	<ul style="list-style-type: none"> • Regularly asking questions on different topics and concepts. • Major and final exams that will enable the student to think and apply the knowledge. • Reports and discussions.
1.2	Preparing and applying project schedules using AON, AOA, PERT and Bar chart methods.		
1.3	Determine project schedule for purpose of resource levelling and allocation and time-cost trade-off.		
1.4	Time and cost monitoring and controlling for an engineering project assessment and management of project risks		
2.0	Cognitive Skills		
2.1	Be able to do project plan and schedule.	<ul style="list-style-type: none"> - Solving problems through assignments on each topic. - Assignment problems, Exercise / tutorial problems for applications that will force the students to think and apply the knowledge gained. - Asking to students to suggest a solution before giving them the correct answer. - Asking the students to explain the steps adopted in the problem and ensures that they understand the problem. - Asking searching questions on topic fundamentals. - Setting M-1 and M-2 + quizzes and mini projects so that students can apply the knowledge gained. 	<ul style="list-style-type: none"> • Asking the student to solve the problems on white board guiding him when required. • Quizzes and Exams. • Asking students to participate in oral discussion during the class. • Setting assignment problems or mini project which will apply principles and concepts. • Questions in quiz, major and final exams which will enable the student to think and apply concepts and principles learnt.
2.2	Learn how to break down the project works into work packages.		
2.3	Learn to make Time and Cost trade-off in case if want to make project time reduction.		
2.4	How how to make resources management of a project		
2.5	During exercise sessions: determine, estimate, draw diagrams, design, conduct, evaluate and comment.		
3.0	Interpersonal Skills & Responsibility		

3.1	Help the student to solve the problem by asking questions during the office hours.	- Solve the problems by asking sequential questions.	• Group work to do assignment activity.
3.2	Different access to the student to be close with the teacher using, email, website and even phone calls in urgent.	- Paying personal attention to each student and caring about his situation.	• Bonus marks to those who are improving and participating effectively in the class.
4.0	Communication, Information Technology, Numerical		
4.1	Developing the computer skills in preparing presentation.	- Asking students to solve problems in the class by guiding him.	• Discussion, Questioning during topics.
4.2	Developing the communication skills through interactive discussing during the seminar		• Highlighting the concepts and principles through real life problems
4.3	Students have to be familiar with using the modern information technology such as interment, and smart board.		• Asking the students to solve the numerical part and check that the answers are tallying with notes. • Asking the students to participate in evaluating their mates.
5.0	Psychomotor		
5.1	Questioning the students on solving the problem in a reverse manner.	- Make the class attractive and full of activations by raising questions and discussions that requires straight thinking and also reverse thinking.	• Questioning

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	First exam	5	20
2	Second exam	10	20
3	Quizzes	7,12	10
4	Report, and homework assignments	7-10	10
5	Final Exam	16	40
6	Total		100

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

Every day one hour is marked as Office Hour in the Time Table of teaching staff. During this hour the students can consult the teacher individually on a one to one basis for academic advice. In all,

teaching staff is available for more than 7 hours per week for academic advice beyond lectures and tutorials.

E. Learning Resources

1. List Required Textbooks Gray, Clifford F. and Erik W. Larson. 2011. Project Management: The Managerial Process. 5 th edition. McGraw-Hill Irwin Publishers.
2. List Essential References Materials (Journals, Reports, etc.)
3. List Recommended Textbooks and Reference Material (Journals, Reports, etc) Kerzner, Harold (2003) Project Management: A Systems Approach to Planning, Scheduling, and Controlling, 8th Edition, John Wiley & sons, USA.
4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.) Selected Papers, and video clips from U-tube and trustable web sites.
5. Other learning material such as computer-based programs/CD, professional standards or regulations and software. Seeking soil mechanics software's.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) - Lecture room available – (25 students/class) to avoid student movement. It is necessary to keep lectures for one course / level in the same classroom.
2. Computing resources (AV, data show, Smart Board, software, etc.) Available for students in the computer labs. Better to add more in other areas so the students can use them during the break time.
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching Importance of feedback should be first explained. Only then the feedback should be taken. Have a question as to how the teaching can be improved – speed, more problems etc. Still we depend on the evaluation of previous semesters. However, I intend to do assessment at the middle of each semester.
2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor - Ask the students if the speed of teaching and the approach is helping the students in learning the subject. - Students are free to report any difficulties to the Head of the department.
3 Processes for Improvement of Teaching - Review of strategy of at the mid-semester after assessment of M-1 answer papers. - Group discussion and using different ways in teaching (white board, seminars, Power point, reading, conducting lab works, etc...)

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

- Independent checking of end-semester assessment (another faculty member)
- Checking of course files by the Quality Centre Nominee and give suggestions for improvement in writing.

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- Mid Semester review of Course files.
- End Semester review of Course files.
- Student feedback at end of the semester.
- Feedback of the assessment at the beginning of the next semester.
- Departmental meeting at the beginning of the next semester on improvements suggested.

STAT 201

Course Specification

Majmaah University
College of Engineering / Department of Basic Engineering Sciences

A. Course Identification and General Information

1. Course title and code: Statistics and Probability STAT 201
2. Credit hours: 3
3. Program(s) in which the course is offered: college requirement
4. Name of faculty member responsible for the course: Dr Muhammad Al-Salamah Dr Mukhtar Salah
5. Year at which this course is offered: sophomore year, spring semester
6. Pre-requisites for this course: none
7. Co-requisites for this course: none
8. Location if not on main campus: main campus

B. Objectives

Summary of the main learning outcomes for students enrolled in the course.
Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)
<ul style="list-style-type: none"> Illustrate to students the use of specialized statistics and graphing software packages such as statistical functions in MS Excel and Minitab

C. Course Description (Note: General description in the form to be used for the Bulletin or Handbook should be attached)

1. Topics to be Covered		
List of Topics	No of Weeks	Contact hours
Introduction to engineering experiments, statistics and data classifications	1/3	1
Graphical presentations of observations	2/3	2
Measures of Central Tendency and Dispersion and Positions for ungrouped data	2,3	6
Probability: sample space, event, Axioms of Probability, conditional probability and independence	4,5	6
Random variable: Discrete and continuous	6	3
Common Distributions: Bernoulli, Binomial, Poisson, Normal and Exponential distribution	7,8	6
Confidence Intervals CI: Large and small sample CI for population mean, CI for proportion, CI for the difference between two means	9,10	6
Testing Hypothesis: Large and small sample test for population mean, test for a population proportion, large and small sample test for difference between two means	11,12,13	9
Correlation and simple linear regression	14,15	6

2. Course components (total contact hours per semester):				
Lecture: 45	Tutorial: 15	Laboratory: 0	Practical/Field work/Internship: 0	Other: 0

3. Additional private study/learning hours expected for students per week. (This should be an average for the semester not a specific requirement in each week): none

<p>4. Development of Learning Outcomes in Domains of Learning</p> <p>For each of the domains of learning shown below indicate:</p> <ul style="list-style-type: none">• A brief summary of the knowledge or skill the course is intended to develop;• A description of the teaching strategies to be used in the course to develop that knowledge or skill;• The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.
<p>a. Knowledge</p>
<p>(i) Description of the knowledge to be acquired</p> <ul style="list-style-type: none">• Graphical presentation and summary of collected observations• Calculation of the probability from probability distribution functions• Making statistical inferences about a population based on a sample drawn from it
<p>(ii) Teaching strategies to be used to develop that knowledge</p> <ul style="list-style-type: none">• Lectures• Exercises• Homework assignments
<p>(iii) Methods of assessment of knowledge acquired</p> <ul style="list-style-type: none">• Homework assignments• Quizzes• Exams
<p>b. Cognitive Skills</p>
<p>(i) Description of cognitive skills to be developed: the ability to</p> <ul style="list-style-type: none">• Give meaning to the central tendency and dispersion•
<p>(ii) Teaching strategies to be used to develop these cognitive skills</p>
<p>(iii) Methods of assessment of students cognitive skills</p>
<p>c. Interpersonal Skills and Responsibility</p>
<p>(i) Description of the interpersonal skills and capacity to carry responsibility to be developed</p>
<p>(ii) Teaching strategies to be used to develop these skills and abilities</p>

(iii) Methods of assessment of students interpersonal skills and capacity to carry responsibility
d. Communication, Information Technology and Numerical Skills
(i) Description of the skills to be developed in this domain: <ul style="list-style-type: none"> • Basic arithmetic operations • Integration
(ii) Teaching strategies to be used to develop these skills <ul style="list-style-type: none"> • Lecture • Exercise
(iii) Methods of assessment of students numerical and communication skills <ul style="list-style-type: none"> • Homework assignments • Quizzes • Exams
e. Psychomotor Skills (if applicable)
(i) Description of the psychomotor skills to be developed and the level of performance required: None
(ii) Teaching strategies to be used to develop these skills
(iii) Methods of assessment of students psychomotor skills

5. Development of Learning Outcomes in Domains of			
Assessment	Assessment task	Week due	Proportion of Final Assessment
1	First Exam	8	20 points
2	Second Exam	15	20 points
3	Quiz and homework assignments	Throughout the semester	20 points
4	Final Exam	Final exams period	40 points

D. Student Support

Arrangements for availability of teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week): weekly office hours

E. Learning Resources

1. Required Text: William Navida , Statistics for Engineers and Scientists, 3rd edition. McGraw-Hill, 2011. ISBN 978-0-07-337633-2
2. Essential Reference: Prem S. Mann and Christopher J. Lacke, Introductory Statistics, 7th edition, Wiley, 2010.
3. Recommended Books and Reference Material (Journals, Reports, etc): None
4. Electronic Materials, Web Sites etc: None
5. Other learning material such as computer-based programs/CD, professional standards/regulations <ul style="list-style-type: none"> • MS Excel • Minitab

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Lecture rooms, laboratories, etc.): <ul style="list-style-type: none">• Classroom
2. Computing resources: <ul style="list-style-type: none">• Computer lab
3. Other resources (specify -eg. If specific laboratory equipment is required, list requirements or attach list) <ul style="list-style-type: none">• MS Excel• Minitab

G. Course Evaluation and Improvement Processes

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching: <ul style="list-style-type: none">• End of semester student evaluation
2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department: None
3. Processes for Improvement of Teaching: <ul style="list-style-type: none">• Student evaluation and course report will be assessed and studied by the department academic committee.• Any approved changes to the course will appear in the course specification.
4. Processes for Verifying Standards of Student Achievement (eg. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution): None
5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. <ul style="list-style-type: none">• The course report will be examined by the department academic committee; any recommendations must be approved by the department council and will be introduced to the course specification.



