Sana'a University
Faculty of Engineering
Electrical Engineering Department
B.Sc. of Computer and Control Engineering

5. Course Specification of Mathematics 1

I. Course Identification and General Information:						
1.	Course Title:	Mathematics 1				
2.	Course Code & Number:	FR001				
3.	Credit hours:	C.H				Total
		Th.	Tu.	Pr.	Tr.	
		2	-	2	-	3
4.	Study level/ semester at which this course is offered:	1st year / 1st semester				
5.	Pre –requisite (if any):	None				
6.	Co –requisite (if any):	None.				
7.	Program (s) in which the course is offered:	Electrical Engineering				
8.	Language of teaching the course:	English and Arabic				
9.	Location of teaching the course:	Faculty of Engineering				
10.	Prepared By:	Asst. Prof. Dr. Adel Mohammed Al-Odhari				
11.	Date of Approval					

II. Course Description:

This course is a prerequisite for engineering programs in faculty of engineering at Sana'a university. This course aims to provide students with mathematical methods for engineers in semester one at first year. In this course, students are learning process and techniques to develop mathematical modules relevant to engineering. Students will apply the essential concepts in algebra and geometry and calculus which contain the followings functions, limits, derivatives, applications of derivatives, moreover, complex numbers with its operations, polar forms, and De Mover's theorem.

Prepared by	Head of Department	Quality Assurance Unit	Dean of the Faculty	Academic Development Center & Quality Assurance
	Asst. Prof. Dr. Adel Ahmed Al-Shakiri	Assoc. Prof. Dr. Mohammad Algorafi	Prof. Dr. Mohammed AL-Bukhaiti	Assoc. Prof. Dr. Huda Al-Emad

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	III. Course Intended learning outcomes (CILOs) of the course	Referenced PILOs
a1	Demonstrate knowledge and understanding of basic concepts of algebra equations, inequalities, geometric shapes, theorems, functions, limits, derivatives complex numbers with its operations, polar forms and De Mover's theorem.	A1, A2
a2	Explain engineering phenomena related to topics examples.	A1, A2
a3	Describe engineering applications related to the mathematical aspect such as, the role of some function in engineering problems corresponding to real valued and complex valued functions.	A1, A2
b1	Analyze the concepts, theorems and principles of geometric shapes, graphs of functions, continuity and discontinuity of functions, derivatives, velocity, acceleration, De Mover's theorem. roots of complex numbers.	B1, B2
b2	Solve mathematical and engineering problems in different contexts.	B1, B2
b3	Practice mathematical reasoning skill in interpreting mathematical theories and linking them in the interpretation of engineering applications.	B1, B2
c1	Use some software programing and calculators to describe the graph of real valued and complex functions and calculating formulas mathematics.	C1
d1	Work of group and individual reports about resources of mechanical engineering problems depend electrical networks, pipe and traffic flow, data fitting.	D1, D4

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies

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a1- Demonstrate knowledge and understanding of basic concepts of algebra equations, inequalities, geometric shapes, theorems, functions, limits, derivatives complex numbers with its operations, polar forms, De Mover's theorem. roots of complex numbers and functions of complex numbers.	▪ Lectures, ▪ Tutorials laboratory, ▪ Seminars	▪ Examinations, ▪ Laboratory reports, ▪ Homework ▪ Presentations
a2- Explain engineering phenomena related to topics examples.	▪ Lectures, ▪ Tutorials ▪ Self-learning	▪ Examinations, ▪ Test, ▪ Course work, ▪ Assignments, ▪ Group and individual reports.
a.3- Describe engineering applications related to the mathematical aspect such as, the role of some function in engineering problems corresponding to real valued and complex valued functions.	▪ Lectures, ▪ Tutorials ▪ Self-learning	▪ Examinations, ▪ Test, ▪ Course work, ▪ Assignments, ▪ Group and individual reports.

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1- Analyze the concepts, theorems and principles of geometric shapes, graphs of functions, continuity and discontinuity of functions, derivatives, velocity, acceleration, De Mover's theorem. roots of complex numbers.	▪ Lectures ▪ Tutorials	▪ Examinations, ▪ Test, ▪ Course work, ▪ Assignments, ▪ Group and individual reports.

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b2- Solve mathematical and engineering problems in different contexts.	▪ Lectures Tutorials	▪ Examinations, ▪ Test, ▪ Course work, ▪ Assignments, ▪ Group and individual reports.
b.3- Practice mathematical reasoning skill in interpreting mathematical theories and linking them in the interpretation of engineering applications.	▪ Lectures ▪ Tutorials	▪ Examinations, ▪ Test, ▪ Course work, ▪ Assignments, ▪ Group and individual reports.

© Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1- Use some software programing and calculators to describe the graph of real valued and complex functions and calculating formulas mathematics.	▪ Lectures ▪ Tutorials	▪ Examinations, ▪ Test, ▪ Course work, ▪ Assignments, Group and individual reports.

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1- Work of group and individual reports about resources of mechanical engineering problems depend	▪ Tutorials, ▪ Laboratory, ▪ Seminars, ▪ Projects,	▪ Presentations, ▪ Reports.

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electrical networks, pipe and traffic flow, data fitting.	▪ Small group	

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IV. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	Contact hours
1.	Essential of Algebra and Geometry	a1, a2, b1, b2	▪ Factorizing polynomial expression and solving polynomial equations. ▪ Solving inequalities. ▪ Solving simultaneous equations. ▪ Partial fractions. ▪ Coordinates of point in Cartesian and polar form, distance and centroid. Straight line, circle, parabola, ellipse and hyperbola.	2	4
2.	Functions	a1, a2, b1, b2,c1	▪ Basic concept of a function ▪ The graphs of a function. ▪ Composition of functions. ▪ One to one functions and inverse functions. ▪ Parametric representation of a function. ▪ Common Engineering Functions: Polynomial, rational, modulus, unit step, impulse. ▪ Even and odd Functions.	1	2

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3.	Trigonometric Functions.	a1, a2, b1, b2,b3	▪ Graph of trigonometric and inverse trigonometric functions ▪ Trigonometric identities and equations. ▪ The amplitude and period of functions. ▪ Engineering waves.	1	2
4.	Logarithms and exponential functions.	a1, a2, b1, b2	▪ Graph of exponential, laws of indices and simplifying expression of exp. ▪ Hyperbolic functions and hyperbolic ▪ identities. ▪ Graph of logarithms function and laws of logarithms. ▪ Solving equation involving logarithms and exponentials. ▪ Application of Engineering: Discharge of a capacitor, decay of a current in circuit, signal ratio and decibels.	1	2
5.	Limits and continuity	a1, a2, b1, b2,c1	▪ Calculating limits of algebraic, trigonometric, exponential and logarithmic by computational Techniques.	1	2

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			▪ Continuity of functions. ▪ Intermediate Value Theorem for Continuous functions.		
6.	Differentiation and its applications	a1, a2, b1, b2,b3, c1, d1,	▪ Techniques of differentiation. ▪ Derivatives of trigonometric, exponential, logarithmic and hyperbolic functions. ▪ Derivatives of inverse trigonometric and hyperbolic functions. ▪ Implicit differentiation. ▪ Parametric differentiation. ▪ velocity, acceleration ▪ Tangents and normal. ▪ Rolle's Theorem and the Mean Value Theorem. ▪ Maxima and minima. ▪ Mclaurin and Taylor series.	4	8
7.	Complex Numbers	a1, a2, b1, b2.c1, d1	▪ The algebra of complex numbers. ▪ Complex variables and the Argand plane. ▪ Multiplication and division in polar form. ▪ Exponential form of complex numbers. ▪ De Mover's theorem.	4	8

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Number of Weeks /and Units Per Semester	**14**	**28**

B - Practical Aspect:

Order	Tasks/ Experiments	Number of Weeks	Contact hours	Learning Outcomes
1.	▪ Factorizing polynomial expression and solving polynomial equations. ▪ Solving equations and finding roots of complex numbers. ▪ Solving inequalities. ▪ Solving simultaneous equations. ▪ Partial fractions. ▪ Coordinates of point in Cartesian and polar form, distance and centroid. ▪ Straight line, circle, parabola, ellipse and hyperbola.	2	4	a1, a2, a3 b1, b2,b3,c1,d1
2.	▪ Basic concept of a function ▪ The graphs of a function. ▪ Composition of functions. ▪ One to one functions and ▪ inverse functions. ▪ Parametric representation of a function. ▪ Common Engineering Functions: ▪ Polynomial, rational, modulus, unit step, impulse. ▪ Even and odd Functions.	1	2	a1, a2, a3 b1, b2,b3,c1,d1
3.	▪ Graph of trigonometric and inverse trigonometric functions ▪ Trigonometric identities and equations.	1	2	a1, a2, a3 b1, b2,b3,c1,d1

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	▪ The amplitude and period of functions. ▪ Engineering waves.			
4.	▪ Graph of exponential, laws of indices and simplifying expression of exp. ▪ Hyperbolic functions and hyperbolic identities. ▪ Graph of logarithms function and laws of logarithms. ▪ Solving equation involving logarithms and exponentials. ▪ Application of Engineering: Discharge of a capacitor, decay of a current in circuit, signal ratio and decibels.	1	2	a1, a2, a3 b1, b2,b3,c1,d1
5.	▪ Calculating limits of algebraic, trigonometric, exponential and logarithmic by computational Techniques of limits. ▪ Distinguish between continuous and discontinuous functions. ▪ Checking a function is it continuous or not. ▪ Checking a function is satisfying intermediate value theorem for continuous functions.	1	2	a1, a2, a3 b1, b2,b3,c1,d1
6.	▪ Solving problems about tangent line and rates of ▪ change. ▪ Finding derivatives of functions by techniques of differentiation. ▪ Finding derivatives of inverse trigonometric and hyperbolic functions. ▪ Computing derivatives of implicit and parametric functions.	2	4	a1, a2, a3 b1, b2,b3,c1,d1

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7.	▪ Finding tangent and normal line equations. ▪ Satisfying Rolle's theorem and the Mean Value Theorem for some functions. ▪ Calculating maximum and minimum points of functions. ▪ Finding Mclaurin and Taylor series.	2	4	a1, a2, a3 b1, b2,b3,c1,d1
8.	▪ Solving problems about operations of complex numbers. ▪ Calculating complex numbers in polar form and finding roots of complex.	4	8	a1, a2, a3 b1, b2,b3,c1,d1
Number of Weeks /and Units Per Semester		**14**	**28**	

V. Teaching strategies of the course:

- Lectures,
- Tutorials
- Self-learning
- Examinations,
- Test,
- Course work,
- Assignments,
- Group and individual reports.

VI. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark

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1.	Oral presentations explaining the following essential mathematical concepts: geometric shapes, graph of functions, engineering patterns of functions, describe points in different coordinates, tangents, normal, rates of change, velocity, acceleration, algebraic of complex numbers and properties of complex functions.	a1, a2, a3 b1, b2,b3,c1,d1	2nd 4th 6th 8th 10th 12th	3
2.	Individual written assignments or in groups to solve Problems of: • Essential of algebra and geometry. • Graph of functions, limits, continuity derivatives and its application. • Trigonometric Functions. • Logarithms and exponential functions. • Algebraic complex numbers. • Evaluation of complex functions. • Engineering problems.	a1, a2, a3 b1, b2,b3,c1,d1	3rd 5th 7th 9th 11th 13th	4
3.	Show solutions to selected problems from engineering applications related to the mathematical aspect.	a1, a2, a3 b1, b2,b3,c1,d1	4th 8th 12th	3
	Total			**10**

VII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1.	Oral presentations of students	3, 5,8,10,12	7.5	5%	a1, a2, a3, b1, 2,b3,c1,d1

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2.	Individual written assignments or in groups	3rd ,5th,7th 9th,11th,13th	7.5	5%	a1, a2,a3,b1, b2,b3,c1,d1
3.	Mid-term Exam	7th	30	20 %	a1, a2,a3,b1, b2,b3,c1,d1
4.	Final Exam	16th	105	60 %	a1, a2,a3,b1, b2,b3,c1,d1
	Total		**150**	**100 %**	

VIII. Learning Resources:

- *Written in the following order: (Author - Year of publication – Title – Edition – Place of publication – Publisher).*

1- Required Textbook(s) (maximum two).

1. David Cherney, Tom Denton, Rohit Thomas and Andrew Waldron- 2013- Linear Algebra- 1st - Edition- Davis California.
2. Dennis G. Zill- 2018- Advance Engineering Mathematics-6th -Edition- Jones & Bartlett Learning, LLC.

2- Essential References.

1. Peter V. O' Neil-2011- Advance Engineering Mathematics-7th -Edition- Cengage.com.
2. Erwin Kreyszig - 2011- Advance Engineering Mathematics-10th -Edition- John Wiley & Sons, Inc.

3- Electronic Materials and Web Sites *etc*.

1. http://joshua.smcvt.edu/linearalgebra
2. https://www.khanacademy.org/math/linear-algebra
3. https://ocw.mit.edu/courses/mathematics/18-06-linear-algebra-spring-2010/

IX. Course Policies:

1. Class Attendance:

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	-A student should attend not less than 75 % of total hours of the subject; otherwise he will not be able to take the exam and will be considered as exam failure. If the student is absent due to illness, he/she should bring an approved statement from university Clinic
2.	**Tardy:** - For late in attending the class, the student will be initially notified. If he repeated lateness in attending class he will be considered as absent.
3.	**Exam Attendance/Punctuality:** - A student should attend the exam on time. He is Permitted to attend an exam half one hour from exam beginning, after that he/she will not be permitted to take the exam and he/she will be considered as absent in exam.
4.	**Assignments & Projects:** - The assignment is given to the students after each chapter; the student has to submit all the assignments for checking on time.
5.	**Cheating**: - For cheating in exam, a student will be considered as failure. In case the cheating is repeated three times during his/her study the student will be disengaged from the Faculty.
6.	**Plagiarism**: Plagiarism is the attending of a student the exam of a course instead of another student. If the examination committee proved a plagiarism of a student, he will be disengaged from the Faculty. The final disengagement of the student from the Faculty should be confirmed from the Student Council Affair of the university.
7.	**Other policies:** - Mobile phones are not allowed to use during a class lecture. It must be closed, otherwise the student will be asked to leave the lecture room - Mobile phones are not allowed in class during the examination. Lecture notes and assignments my given directly to students using soft or hard copy

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Reviewed By	**Vice Dean for Academic Affairs and Post Graduate Studies: Asst. Prof. Dr. Tarek A. Barakat** **President of Quality Assurance Unit: Assoc. Prof. Dr. Mohammed Algorafi** **Name of Reviewer from the Department: Assoc. Prof. Dr. Riyad A. Muharram.**
	Deputy Rector for Academic Affairs Asst. Prof. Dr. Ibrahim AlMutaa **Assoc. Prof. Dr. Ahmed Mujahed** **Asst. Prof. Dr. Munasar Alsubri**

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5. Template for Course Plan of Mathematics 1

I. Information about Faculty Member Responsible for the Course:

Name of Faculty Member	Dr. Adel Mohammed Alodhari	**Office Hours**					
Location& Telephone No.	777654885	**SAT**	**SUN**	**MON**	**TUE**	**WED**	**THU**
E-mail	ass.prof.adel@gmail.com						

II. Course Identification and General Information:

1.	Course Title:	Mathematics 1				
2.	Course Number & Code:	FR001				
3.	Credit hours:	C.H				Total
		Th.	Tu.	Pr.	Tr.	
		2	-	2	-	3
4.	Study level/year at which this course is offered:	1st year / 1st semester				
5.	Pre –requisite (if any):	None				
6.	Co –requisite (if any):	None.				
7.	Program (s) in which the course is offered	Electrical Engineering				
8.	Language of teaching the course:	English and Arabic				
9.	System of Study:	Credit Hours				
10.	Mode of delivery:	Full Time				
11.	Location of teaching the course:	Classes at the Faculty of Engineering				

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III. Course Description:

This course is a prerequisite for engineering programs in faculty of engineering at Sana'a university. This course aims to provide students with mathematical methods for engineers in semester one at first year. In this course, students are learning process and techniques to develop mathematical modules relevant to engineering. Students will apply the essential concepts in algebra and geometry and calculus which contain the followings functions, limits, derivatives, applications of derivatives, moreover, complex numbers with its operations, polar forms, and De Mover's theorem.

IV. Intended learning outcomes (ILOs) of the course:

- Brief summary of the knowledge or skill the course is intended to develop**:**

1. Demonstrate knowledge and understanding of basic concepts of algebra equations, inequalities, geometric shapes, theorems, functions, limits, derivatives complex numbers with its operations, polar forms and De Mover's theorem.
2. Explain engineering phenomena related to topics examples.
3. Describe engineering applications related to the mathematical aspect such as, the role of some function in engineering problems corresponding to real valued and complex valued functions.
4. Analyze the concepts, theorems and principles of geometric shapes, graphs of functions, continuity and discontinuity of functions, derivatives, velocity, acceleration, De Mover's theorem. roots of complex numbers.
5. Solve mathematical and engineering problems in different contexts.
6. Practice mathematical reasoning skill in interpreting mathematical theories and linking them in the interpretation of engineering applications.
7. Use some software programing and calculators to describe the graph of real valued and complex functions and calculating formulas mathematics.
8. Work of group and individual reports about resources of mechanical engineering problems depend electrical networks, pipe and traffic flow, data fitting.

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V. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Sub Topics List	Number of Weeks	Contact hours
1.	Essential of Algebra and Geometry	▪ Factorizing polynomial expression and solving polynomial equations. ▪ Solving inequalities. ▪ Solving simultaneous equations. ▪ Partial fractions. ▪ Coordinates of point in Cartesian and polar form, distance and centroid. Straight line, circle, parabola, ellipse and hyperbola.	1st ,2nd	4
2.	Functions	▪ Basic concept of a function ▪ The graphs of a function. ▪ Composition of functions. ▪ One to one functions and inverse functions. ▪ Parametric representation of a function. ▪ Common Engineering Functions: Polynomial, rational, modulus, unit step, impulse. ▪ Even and odd Functions.	3rd	2
3.	Trigonometric Functions.	▪ Graph of trigonometric and inverse trigonometric functions ▪ Trigonometric identities and equations.	4th	2

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		▪ The amplitude and period of functions. ▪ Engineering waves.		
4.	Logarithms and exponential functions.	▪ Graph of exponential, laws of indices and simplifying expression of exp. ▪ Hyperbolic functions and hyperbolic ▪ identities. ▪ Graph of logarithms function and laws of logarithms. ▪ Solving equation involving logarithms and exponentials. ▪ Application of Engineering: Discharge of a capacitor, decay of a current in circuit, signal ratio and decibels.	5th	2
5.	Limits and continuity	▪ Calculating limits of algebraic, trigonometric, exponential and logarithmic by computational Techniques. ▪ Continuity of functions. ▪ Intermediate Value Theorem for Continuous functions.	6th	2
6.	Med Term Exam		7th	2
7.	Differentiation and its applications	▪ Techniques of differentiation. ▪ Derivatives of trigonometric, exponential, logarithmic and hyperbolic functions.	8th ,9th ,10th ,11th	8

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		▪ Derivatives of inverse trigonometric and hyperbolic functions. ▪ Implicit differentiation. ▪ Parametric differentiation. ▪ velocity, acceleration ▪ Tangents and normal. ▪ Rolle's Theorem and the Mean Value Theorem. ▪ Maxima and minima. ▪ Mclaurin and Taylor series.		
8.	Complex Numbers	▪ The algebra of complex numbers. ▪ Complex variables and the Argand plane. ▪ Multiplication and division in polar form. ▪ Exponential form of complex numbers. ▪ De Mover's theorem.	12th ,13th ,14th ,15th	8
9.	Final Exam		16th	2
Number of Weeks /and Units Per Semester			**16**	**32**

B - Practical Aspect:

Order	Tasks/ Experiments	Number of Weeks	Contact hours
1.	▪ Factorizing polynomial expression and solving polynomial equations. ▪ Solving equations and finding roots of complex numbers. ▪ Solving inequalities.	1st ,2nd	4

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	▪ Solving simultaneous equations. ▪ Partial fractions. ▪ Coordinates of point in Cartesian and polar form, distance and centroid. ▪ Straight line, circle, parabola, ellipse and hyperbola.		
2.	▪ Basic concept of a function ▪ The graphs of a function. ▪ Composition of functions. ▪ One to one functions and ▪ inverse functions. ▪ Parametric representation of a function. ▪ Common Engineering Functions: ▪ Polynomial, rational, modulus, unit step, impulse. ▪ Even and odd Functions.	3rd	2
3.	▪ Graph of trigonometric and inverse trigonometric functions ▪ Trigonometric identities and equations. ▪ The amplitude and period of functions. ▪ Engineering waves.	4th	2
4.	▪ Graph of exponential, laws of indices and simplifying expression of exp. ▪ Hyperbolic functions and hyperbolic identities. ▪ Graph of logarithms function and laws of logarithms. ▪ Solving equation involving logarithms and exponentials. ▪ Application of Engineering: Discharge of a capacitor, decay of a current in circuit, signal ratio and decibels.	5th	2
5.	▪ Calculating limits of algebraic, trigonometric, exponential and logarithmic by computational Techniques of limits.	6th	2

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	▪ Distinguish between continuous and discontinuous functions. ▪ Checking a function is it continuous or not. ▪ Checking a function is satisfying intermediate value theorem for continuous functions.		
6.	▪ Solving problems about tangent line and rates of ▪ change. ▪ Finding derivatives of functions by techniques of differentiation. ▪ Finding derivatives of inverse trigonometric and hyperbolic functions. ▪ Computing derivatives of implicit and parametric functions.	7^{th} ,8^{th}	4
7.	▪ Finding tangent and normal line equations. ▪ Satisfying Rolle's theorem and the Mean Value Theorem for some functions. ▪ Calculating maximum and minimum points of functions. ▪ Finding Mclaurin and Taylor series.	9^{th} ,10^{th}	4
8.	▪ Solving problems about operations of complex numbers. ▪ Calculating complex numbers in polar form and finding roots of complex.	11^{th} , 12^{th} ,13^{th} ,14^{th}	8
Number of Weeks /and Units Per Semester		**14**	**28**

VI. Teaching strategies of the course:

- Lectures,
- Tutorials
- Self-learning
- Examinations,

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- Test,
- Course work,
- Assignments,
- Group and individual reports.

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VII. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1.	Oral presentations explaining the following essential mathematical concepts: geometric shapes, graph of functions, engineering patterns of functions, describe points in different coordinates, tangents, normal, rates of change, velocity, acceleration, algebraic of complex numbers and properties of complex functions.	a1, a2, a3 b1, b2,b3,c1,d1	2nd 4th 6th 8th 10th 12th	3
2.	Individual written assignments or in groups to solve Problems of: • Essential of algebra and geometry. • Graph of functions, limits, continuity derivatives and its application. • Trigonometric Functions. • Logarithms and exponential functions. • Algebraic complex numbers. • Evaluation of complex functions. • Engineering problems.	a1, a2, a3 b1, b2,b3,c1,d1	3rd 5th 7th 9th 11th 13th	4
3.	Show solutions to selected problems from engineering applications related to the mathematical aspect.	a1, a2, a3 b1, b2,b3,c1,d1	4th 8th 12th	3
	Total			**10**

VIII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment

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1.	Oral presentations of students	3, 5,8,10,12	7.5	5%
2.	Individual written assignments or in groups	3rd ,5th,7th 9th,11th,13th	7.5	5%
3.	Mid-term Exam	7th	30	20 %
4.	Final Exam	16th	105	60 %
	Total		**150**	**100 %**

IX. Learning Resources:

- *Written in the following order: (Author - Year of publication – Title – Edition – Place of publication – Publisher).*

1- Required Textbook(s) (maximum two).

1. David Cherney, Tom Denton, Rohit Thomas and Andrew Waldron- 2013- Linear Algebra- 1st - Edition- Davis California.
2. Dennis G. Zill- 2018- Advance Engineering Mathematics-6th -Edition- Jones & Bartlett Learning, LLC.

2- Essential References.

1. Peter V. O' Neil-2011- Advance Engineering Mathematics-7th -Edition- Cengage.com.
2. Erwin Kreyszig - 2011- Advance Engineering Mathematics-10th -Edition- John Wiley & Sons, Inc.

3- Electronic Materials and Web Sites *etc*.

1. http://joshua.smcvt.edu/linearalgebra
2. https://www.khanacademy.org/math/linear-algebra
3. https://ocw.mit.edu/courses/mathematics/18-06-linear-algebra-spring-2010/

X. Course Policies:

1.	**Class Attendance:** A student should attend not less than 75 % of total hours of the subject; otherwise he will not be able to take the exam and will be considered as exam failure. If the student is absent due to illness, he/she should bring an approved statement from university Clinic
2.	**Tardy:**

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	For late in attending the class, the student will be initially notified. If he repeated lateness in attending class he will be considered as absent.
3.	**Exam Attendance/Punctuality:** A student should attend the exam on time. He is Permitted to attend an exam half one hour from exam beginning, after that he/she will not be permitted to take the exam and he/she will be considered as absent in exam-
4.	**Assignments & Projects:** The assignment is given to the students after each chapter; the student has to submit all the assignments for checking on time-
5.	**Cheating:** For cheating in exam, a student will be considered as failure. In case the cheating is repeated three times during his/her study the student will be disengaged from the Faculty-
6.	**Plagiarism:** Plagiarism is the attending of a student the exam of a course instead of another student. If the examination committee proved a plagiarism of a student, he will be disengaged from the Faculty. The final disengagement of the student from the Faculty should be confirmed from the Student Council Affair of the university.
7.	**Other policies:** - Mobile phones are not allowed to use during a class lecture. It must be closed, otherwise the student will be asked to leave the lecture room - Mobile phones are not allowed in class during the examination. Lecture notes and assignments my given directly to students using soft or hard copy

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