

هندسة ميكانيكية Mechanical Engineering	١. اسم البرنامج Programmer Title
MECH	٢. رمز البرنامج Programmer code
جامعة ذي قار University of Thi-Qar	٣. المؤسسة التعليمية Teaching Institution
كلية الهندسة College of Engineering	٤. الكلية college
قسم الهندسة الميكانيكية Mechanical Engineering Department	٥. القسم Department
النظام الفصلي Course System	٦. النظام الدراسي Attendance type
الفصل الدراسي الاول & الثاني	٧. الفصل الدراسي Attendance Session
161	٨. عدد وحدات البرنامج Credits
بكالوريوس هندسة ميكانيكية Bachelor of Mechanical Engineering	٩. الشهادة الممنوحة Final Award
قسم الهندسة الميكانيكية	١٠. الجهة المعتمدة للبرنامج Programmer Accredited
ا.م.د احمد جاسم شكاره	١١. اسم منسق البرنامج Programmer Coordinator
2017 وتم تحديثه ٢٠٢١	١٢. تاريخ اعداد البرنامج Date of Programmer
١٣. اهداف البرنامج الاكاديمي Programmer Aims	
<p>(ا) تخريج الكوادر الهندسية في مجال الهندسة الميكانيكية القادرة على مواجهة كل الصعوبات والمعوقات التي تواجهها اثناء العمل في القطاعات الصناعية والتكنولوجية من خلال تسليحها بكافة المعلومات والاساسيات والحقائق العلمية التي يحتاجها في مجال عمله في اختصاص الهندسة الميكانيكية.</p> <p>(ب) السعي لتخريج مهندسين باختصاصات الهندسة الميكانيكية المختلفة لهم القدرة على الابداع والابتكار في مجالات العمل الهندسي المختلفة بعد تخرجهم ومواكبة التطور العلمي والتكنولوجي الحاصل في العالم.</p> <p>(ج) تهيئة الكوادر الفنية والهندسية في اختصاص الهندسة الميكانيكية للاطلاع على اهم المستجدات العلمية</p>	
<p>طرائق تقييم المهارات العامة والمنقولة Assessment Methods</p> <p>١- لجان مناقشة بحوث التخرج لطلبة المرحلة المنتهية</p> <p>٢- ورش العمل التخصصية</p>	

٣- المقابلات الشخصية والمراسلات

١٥. بنية البرنامج Programmer Structure

Year 1-15 السنة الدراسية الاولى Year 1					
عدد الوحدات المعتمدة	عدد الساعات		رمز المقرر Code No.	اسم المقرر	
	نظري	عملي			
3		4	ER 101	Mathematics I	First Semester
3		4	ME101	Engineering mechanics (static I)	
3	2	2	ME102	Metallurgical Engineering	
4	2	3	ME103	Principle of production processes	
4	2	3	ER102	Principle of computer science	
2		2	UR101	Arabic language	
2		2	ER103	Physics	
3		4	ER 104	Mathematics II	Second Semester
3		4	ME104	Engineering mechanics (static II)	
3	2	2	ME105	Properties of Engineering Materials	
7	5	6	ER105	Engineering drawing +Descriptive engineering	
3	1	3	ME106	Electrical Engineering	
2		2	UR102	Technical English Language	
2		2	ER106	Fundamental of chemical principle	
44	عدد الوحدات الكلي				

٢- 15- السنة الدراسية الثانية Year ٢					
عدد الوحدات المعتمدة	عدد الساعات		رمز المقرر Code No.	اسم المقرر	
	نظري	عملي			
3		4	ER 201	Applied Mathematics II	٣ -

3	1	2	ME201	Strength of Materials I	
3	1	2	ME202	Applied Thermodynamics I	
3	1	2	ME203	Fluid Mechanics I	
2		2	UR201	Human right and democracy	
4	2	3	ER202	Computer programming	
3		4	ER 203	Applied Mathematics II	Second Semester
3	1	2	ME204	Strength of Materials II	
4		4	ME205	Engineering mechanics(dynamic)	
3	1	2	ME206	Applied Thermodynamics II	
4	4	2	ME207	Mechanical Drawing	
3	1	2	ME208	Fluid Mechanics II	
2		2		English language	
40	عدد الوحدات الكلي				

3-15 السنة الدراسية الثالثة 3 Year						
عدد الوحدات المعتمدة	عدد الساعات		رمز المقرر Code No.	اسم المقرر		
	عملي	نظري				
2		2	ME301	Engineering Analyses	First Semester	
3	1	2	ME302	Heat Transfer I		
4	2	3	ME303	Manufacturing Processes		
3	1	2	ME306	Internal Combustion Engine I		
3	2	2	ME307	Gas dynamics		
3	1	3	ME308	Theory of Machine I		
2		2	ME309	Numerical Analyses		Second Semester
3	1	2	ME310	Heat Transfer II		
3	2	2	ME312	Electrical Machinery Fundamentals		
3	2	2	ME313	Computer Aided Design(CAD/CAM)		
3	1	2	ME314	Internal Combustion Engine II		
3	2	2	ME315	Turbo Machinery		
3	1	2	ME316	Theory of Machine II		
				Summer Training		
38	عدد الوحدات الكلي					

4-15 السنة الدراسية الرابعة 4 Year					
عدد الوحدات المعتمدة	عدد الساعات		رمز المقرر Code No.	اسم المقرر	
	عملي	نظري			
4		4	ME401	Mechanical Vibrations I	Firs +
2	2	1	ME402	Engineering Project I	

4	1	3	ME403	Refrigeration and Air Conditioning I	
3		3	ME404	Engineering Materials	
4		4	ME405	Machine Design	
3		3	ME406	Industrial Engineering And Quality Control	
2	1	2	ME407	Power Plant I	
2	2	1	ME410	Engineering Project I	Second Semester
4	1	3	ME411	Refrigeration and Air Conditioning I I	
4		4	ME413	Design of machine system	
2	1	2	ME415	Power Plant I	
4	1	3	ME416	Control and measurement	
1		1	ME401	Ethics	
39	عدد الوحدات الكلي				

Regulation of Assessment ١٦ . الانظمة واللوائح الخاصة بتقييم الطلبة

١-لجان مناقشة بحوث التخرج لطلبة المرحلة المنتهية

٢-ورش العمل التخصصية

٣-المقابلات الشخصية والمراسلات

١٧. معيار القبول (الانظمة المتعلقة بالالتحاق بالكلية والقسم العلمي)

Criteria for Admission

اولا شروط القبول في الكلية:

١-اعتماد شروط القبول للطلاب وفق لوائح وزارة التعليم العالي والبحث العلمي(القبول المركزي)

٢-ان تجتاز بنجاح اي اختبار خاص او مقابلة شخصية يراها مجلس الكلية او الجامعة

٣-أن يكون لائق طبيا للتخصص المتقدم اليه.

ثانيا شروط القبول في القسم العلمي- :

1-اختيار رغبة الطالب من أكثر من رغبة مرتب حسب الأفضلية.

2-معدل القبول في الثانوية العامة.

3-معدل مقرر القسم الذي يرغب فيه الطالب بالدراسة.

4-الطاقة الاستيعابية للقسم العلمي

Syllabus of first year-first semester

Subject: Mathematics I

<u>No</u>	<u>Title</u>	<u>Week No.</u>
1	<u>Algebraic non- algebraic functions and its inverse</u>	<u>1-2</u>
2	<u>Limits</u>	<u>3-4</u>
3	<u>Continuity Derivation,</u>	<u>5-6</u>
4	<u>Logarithmic function</u>	<u>6-7</u>
5	<u>Hyperbolic function</u>	<u>7-9</u>
6	<u>Application of derivation, Polar coordinates and parametric equation,</u>	<u>9-11</u>
7	<u>Integration and its application, Method of integration</u>	<u>11-13</u>
8	<u>Definite integral and its application, Area, Volume.</u>	<u>13-15</u>

Subject: Engineering mechanics (static I)

<u>No</u>	<u>Title</u>	<u>Week No.</u>
1	Introduction to Statics	<u>1-2</u>
2	Force Systems,	<u>3-4</u>
3	Rectangular Components (2-D)	<u>5-6</u>
4	Moment (2-D)	<u>6-7</u>
5	Couple (2.D)	<u>7-9</u>
6	Resultants (2-D)	<u>9-12</u>
7	Rectangular Components (3-.D).	<u>12-15</u>

Subject: Metallurgical Engineering

<u>No</u>	<u>Title</u>	<u>Week No.</u>
1	introduction and Classification of engineering materials	<u>1-2</u>
2	Crystal structure	<u>3-4</u>
3	Imperfections in crystals	<u>5-6</u>
4	Thermal equilibrium diagrams	<u>6-7</u>
<u>5</u>	<u>Lever rule</u>	<u>7-9</u>
<u>6</u>	<u>Applications on binary phase diagrams and Mechanical properties of metals</u>	<u>9-12</u>
<u>7</u>	<u>Carbon steel and Cast Iron</u>	<u>12-15</u>

Subject: Properties of materials engineering

<u>No</u>	<u>Title</u>	<u>Week No.</u>
1	Alloy steel	<u>1-2</u>
2	Copper and its alloys, Aluminum and its alloys	<u>3-4</u>
3	Nano materials	<u>5-6</u>
4	Plastics	<u>6-8</u>
<u>5</u>	<u>Ceramics and glass</u>	<u>8-10</u>
<u>6</u>	<u>Composite Materials.</u>	<u>10-15</u>

Subject: Principle of production processes

<u>No</u>	<u>Title</u>	<u>Week No.</u>
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1	الخواص الميكانيكية والفيزيائية	<u>1-2</u>
2	انتاج المعادن	<u>3-4</u>
3	القياس والتحديد وعدد التشغيل اليدوي	<u>5-6</u>
4	تشغيل المعادن، الية انجماد المعادن	<u>6-7</u>
<u>5</u>	<u>عملية السباكة. عمليات التشكيل الميكانيكي، إعادة التبلور والتشكيل الميكانيكي</u>	<u>7-9</u>
<u>6</u>	<u>تقنيات المساحيق، اللدائن،</u>	<u>9-12</u>
<u>7</u>	<u>وصل المعادن</u>	<u>12-15</u>

Subject: Principle of computer science

<u>No</u>	<u>Title</u>	<u>Week No.</u>
1	Introduction to programming - programming using quick basic	<u>1-2</u>
2	Variables types and their declaration	<u>3-4</u>
3	Input/output commands, Examples, Mathematical relationships, If statement - select case, For loop do loop	<u>5-6</u>
4	Examples, Arrays, Two dimensions arrays, Arrays example, Triangular function square root function,	<u>6-7</u>
<u>5</u>	<u>Methods of creating a complete program. Introduction to Visual Basic Language and Environment.</u>	<u>7-9</u>
<u>6</u>	<u>working with controls: List boxes and Combo boxes, Option buttons and Check boxes, List boxes and Combo boxes,</u>	<u>9-11</u>
<u>7</u>	<u>Input box and Msg box, Frames</u>	<u>11-13</u>

<u>8</u>	<u>Lines, Shapes, and Images Controls, Projects</u>	<u>13-15</u>
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Subject: Arabic language

<u>No</u>	<u>Title</u>	<u>Week No.</u>
1	التاء المربوطة والتاء المبسوطة + قصيدة لاحمد شوقي، العدد والمعدود	<u>1-2</u>
2	اسلوب الشرط +قصيدة ابن الرومي، الالف المدودة والألف المقصورة + نص قرآني،	<u>3-4</u>
3	علامات الترقيم، حروف الجر + قصيدة بدر شاكر السياب،	<u>5-6</u>
4	الضاد والظاء + الاسماء الخمسة، خطبة الامام علي (عليه السلام)،	<u>6-7</u>
<u>5</u>	<u>انواع الهمزة، نشأة اللغة العربية</u>	<u>7-9</u>
<u>6</u>	<u>، اسلوب النداء، نص قرآني + المبتدأ والخبر، المعجم العربي،</u>	<u>9-11</u>
<u>7</u>	<u>الافعال الخمسة،</u>	<u>11-13</u>
<u>8</u>	<u>نصب الفعل المضارع</u>	<u>13-15</u>

Subject: Physics

<u>No</u>	<u>Title</u>	<u>Week No.</u>
1	<u>Algebraic non- algebraic functions and its inverse</u>	<u>1-2</u>
2	<u>Limits</u>	<u>3-4</u>
3	<u>Continuity Derivation,</u>	<u>5-6</u>
4	<u>Logarithmic function</u>	<u>6-7</u>
<u>5</u>	<u>Hyperbolic function</u>	<u>7-9</u>

<u>6</u>	<u>Application of derivation, Polar coordinates and parametric equation,</u>	<u>9-11</u>
<u>7</u>	<u>Integration and its application, Method of integration</u>	<u>11-13</u>
<u>8</u>	<u>Definite integral and its application, Area, Volume.</u>	<u>13-15</u>

Syllabus of first year-second semester

Subject: Mathematics II

<u>No</u>	<u>Title</u>	<u>Week No.</u>
1	Arc length surface area, Vectors - vectors product, Line and plane equation, Vectors, function - curvature, Matrix and determinant, Simultaneous linear algebraic equations, Cramer method, Matrix - inversion method, Numerical method to solve non-linear algebraic equation, Numerical integration, Interval - halving method false position method newton's method, Numerical integration trapezoidal rule Simpsons rule.	<u>1-2</u>
2	Vectors, function - curvature, Matrix and determinant	<u>3-4</u>
3	Simultaneous linear algebraic equations	<u>5-6</u>
4	Cramer method	<u>6-7</u>

<u>5</u>	Matrix - inversion method	<u>7-9</u>
<u>6</u>	Numerical method to solve non-linear algebraic equation	<u>9-11</u>
<u>7</u>	Numerical integration	<u>11-13</u>
<u>8</u>	Interval - halving method false position method newton's method, Numerical integration trapezoidal rule Simpsons rule.	<u>13-15</u>

Subject: Engineering mechanics (static II)

<u>No</u>	<u>Title</u>	<u>Week No.</u>
1	Frames and Machines	<u>1-2</u>
2	Distributed Forces	<u>3-4</u>
3	Cancroids	<u>5-6</u>
4	Composite Bodies and Figures,	<u>6-7</u>
<u>5</u>	Beams: External Effects	<u>7-9</u>
<u>6</u>	Beams: Internal Effects	<u>9-11</u>
<u>7</u>	Flexible Cables	<u>11-13</u>
<u>8</u>	Fluid Statics.	<u>13-15</u>

Subject: Metallurgical Engineering

<u>No</u>	<u>Title</u>	<u>Week No.</u>
1	Introduction and Classification of engineering materials	<u>1-2</u>
2	Crystal structure	<u>3-4</u>
3	Imperfections in crystals	<u>5-6</u>
4	Thermal equilibrium diagrams	<u>6-7</u>
<u>5</u>	Lever rule, Applications on binary phase diagrams	<u>7-9</u>
<u>6</u>	Mechanical properties of metals	<u>9-11</u>

<u>7</u>	Carbon steel, Cast Iron	<u>11-13</u>
<u>8</u>	Heat treatment of steel, Alloy steel	<u>13-15</u>

Subject: Properties of Engineering Materials

<u>No</u>	<u>Title</u>	<u>Week No.</u>
1	Alloy steel	<u>1-2</u>
2	Copper and its alloys	<u>3-4</u>
3	Aluminum and its alloys	<u>5-6</u>
4	Nano materials	<u>6-7</u>
<u>5</u>	Plastics	<u>7-9</u>
<u>6</u>	Ceramics and glass	<u>9-11</u>
<u>7</u>	Composite Materials.	<u>11-15</u>

Subject: Engineering drawing +Descriptive engineering

<u>No</u>	<u>Title</u>	<u>Week No.</u>
1	مقدمة وأدوات الرسم، استخدام أدوات الرسم/ الخط الهندسي وأنواع الخطوط، العمليات الهندسية، المساقط	<u>1-2</u>
2	المساقط المقطوعة، استنساخ مسقط مجهول من مسقطين معلومين (المسقط الثالث).	<u>3-4</u>
3	وضع الأبعاد على المساقط، الرسم الحر، الرسم المجسم، استنساخ المجسمات من المساقط، القطع في المجسمات	<u>5-6</u>
4	الأبعاد في المجسمات، رسم أجزاء المكائن (البراغي)، الرسم التجميعي	<u>6-7</u>
<u>5</u>	<u>Descriptive geometry and methods of projection</u>	<u>7-9</u>
<u>6</u>	<u>Projection of point, Projection of straight line</u>	<u>9-11</u>
<u>7</u>	<u>Projection plane surface, Auxiliary planes</u>	<u>11-13</u>
<u>8</u>	<u>Development, Application.</u>	<u>13-15</u>

Subject: Technical English Language

<u>No</u>	<u>Title</u>	<u>Week No.</u>
1	Parts of speech (nouns, pronouns, verbs)	<u>1-2</u>
2	adverbs, prepositions	<u>3-4</u>
3	conjunctions, interjections	<u>5-6</u>
4	kinds of sentences (simple, compound, complex)	<u>6-7</u>
5	subordinate clauses	<u>7-9</u>
6	change of sentences from simple to compound and vice versa	<u>9-11</u>
7	tenses	<u>11-13</u>
8	passive and active; direct and indirect speech.	<u>13-15</u>

Subject: Fundamental of chemical principle

<u>No</u>	<u>Title</u>	<u>Week No.</u>
1	Introduction to basic concepts of chemistry including chemical reactions and bonding	<u>1-5</u>
2	electronic and molecular structure.	<u>5-10</u>
3	gases and thermochemistry	<u>10-15</u>

Syllabus of second year-first semester

Subject: Applied Mathematics II

<u>No</u>	<u>Title</u>	<u>Week No.</u>
1	Function of several variable, Limit partial derivatives	<u>1-2</u>
2	Cordiant, Directional derivatives, Tangent plane, Normal line	<u>3-4</u>
3	Extra (max, man and saddle points .	<u>5-6</u>

<u>4</u>	Lagrange multipliers	<u>6-7</u>
<u>5</u>	Double and triple integrals and its application	<u>7-9</u>
<u>6</u>	Area, Volume, Center of mass, Line and surface integral	<u>9-11</u>
<u>7</u>	Green theorem, Divergence theorem of gauss	<u>11-13</u>
<u>8</u>	Multiplied, Stokes 's theorem	<u>13-15</u>

Subject: Strength of Materials I

<u>No</u>	<u>Title</u>	<u>Week No.</u>
1	Simple stress, Shear Stress-Bearing stress	<u>1-2</u>
2	Thin walled pressure, Simple strain-Hook's law	<u>3-4</u>
3	Axial deformations, Statically Indeterminate Members, Thermal Stresses	<u>5-6</u>
4	Torsion	<u>6-7</u>
<u>5</u>	Shear and moment in beams	<u>7-9</u>
<u>6</u>	Shear force and bending moment diagrams	<u>9-11</u>
<u>7</u>	Stresses in beams	<u>11-13</u>
<u>8</u>	,Shear stress in beams, Curved beams	<u>13-15</u>

Subject: Applied Thermodynamics I

<u>No</u>	<u>Title</u>	<u>Week No.</u>
1	Introduction, Definition/ force / pressure, Energy resource / uses	<u>1-2</u>
2	Heat / work / power, Internal energy / enthalpy / zeroth law	<u>3-4</u>

<u>3</u>	Temperature and its measurement, First law of thermodynamics / perpetual motion machine, Boyles law / Charles law	<u>5-6</u>
<u>4</u>	Equation of state / closed system processes	<u>6-7</u>
<u>5</u>	Constant volume pressure and processes	<u>7-9</u>
<u>6</u>	Adiabatic and polytropic processes	<u>9-11</u>
<u>7</u>	Open system processes / steady flow energy equation	<u>11-13</u>
<u>8</u>	and its application.	<u>13-15</u>

Subject: Fluid Mechanics I

<u>No</u>	<u>Title</u>	<u>Week No.</u>
<u>1</u>	General introduction to fluid science	<u>1-2</u>
<u>2</u>	Fluid static and pressure application	<u>3-4</u>
<u>3</u>	Forces on immersed bodies and surface, Accelerated fluid and relative motion	<u>5-6</u>
<u>4</u>	Equilibrium of floating bodies	<u>6-7</u>
<u>5</u>	Introduction to fluid motion	<u>7-9</u>
<u>6</u>	Continuity equation	<u>9-11</u>
<u>7</u>	Equations of motions and their applications.	<u>11-15</u>

Subject: Computer programming

<u>No</u>	<u>Title</u>	<u>Week No.</u>
<u>1</u>	Introduction to programming in Fortran 90, Rules of Fortran 90	<u>1-2</u>
<u>2</u>	Variables and Constant Types	<u>3-4</u>
<u>3</u>	Assignment statement, Library Function	<u>5-6</u>
<u>4</u>	Input/output statement,	<u>6-7</u>

	Relational Operators and Logical Operands	
<u>5</u>	Control Construct (IF, Select Case), Loop Statement (Do Construct), Engineering Examples. Arrays, One Dimension Arrays	<u>7-9</u>
<u>6</u>	Two Dimension Arrays, Arithmetic operation on Arrays	<u>9-11</u>
<u>7</u>	Sort Arrays, Search Arrays, Subprogram	<u>11-13</u>
<u>8</u>	Statement function, Functions, Subroutines, Modules, Derived Types, Engineering Examples	<u>13-15</u>

Syllabus of second year-second semester

Subject: Applied Mathematics II

<u>No</u>	<u>Title</u>	<u>Week No.</u>
1	Complex numbers, Tangent, Demon theorem	<u>1-2</u>
2	series solutions, Tests, Cramer basic, Power series	<u>3-4</u>
3	Taylor and maclorrian series, Ordinary differential equations	<u>5-6</u>
4	1st order solution, 2nd order solution	<u>6-7</u>
<u>5</u>	Linear system of differential equation	<u>7-9</u>
<u>6</u>	1st and 2nd order with the constant coefficient	<u>9-11</u>
<u>7</u>	Eigen problems, Numerical solutions of O. D. E.	<u>11-13</u>
<u>8</u>	Euler method, Range cute method.	<u>13-15</u>

Subject: Strength of Materials II

<u>No</u>	<u>Title</u>	<u>Week No.</u>
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1	Slope and deflection in beams	<u>1-2</u>
2	Moment area method	<u>3-4</u>
3	Castiglione's method, Combined stresses	<u>5-6</u>
4	Moher's circle for stresses	<u>6-7</u>
<u>5</u>	Moher's circle for strain, Columns, Euler's equation for column	<u>7-9</u>
<u>6</u>	Theories of failure	<u>9-11</u>
<u>7</u>	Helical Springs	<u>11-13</u>

Subject: Engineering mechanics(dynamic)

<u>No</u>	<u>Title</u>	<u>Week No.</u>
1	Introduction, Rectilinear Continuous Motion, Rectilinear Erratic and Curvilinear Motion, Curvilinear Components, Projectile Motion	<u>1-2</u>
2	Normal, Tangent, & Cylindrical Components, Normal, Tangent, & Cylindrical Components, Dependent Motion and Rclative Motion	<u>3-4</u>
3	Newton's Laws, Equations of Motion, Rectangular Equations of Motion, Normal	<u>5-6</u>
4	Tangent, & Cylindrical Eqs. of Motion, Force, Work, and Energy,	<u>6-7</u>
<u>5</u>	Conservative Forces, Potential Energy, Impulse and Momentum, Conservation of Linear Momentum Angular Momentum and Impulse.	<u>7-9</u>
<u>6</u>	Rigid Body Motion and Translation, Rotation About a Fixed Axis, Relative Motion of, a Rigid Body: Velocity, Relative Motion: Acceleration, Rotation,	<u>9-11</u>

	Moment of Inertia, Rigid Body Eq. of Motion	
<u>7</u>	Rigid Body Motion: Translation, Rotation, General Plane Motion, Kinetic Energy, Work of a Force, Work of a Couple, Work, Energy, and Conservation	<u>11-13</u>
<u>8</u>	Linear and Angular Momentum, Impulse, Conservation of Momentum, Mechanical vibrations.	<u>13-15</u>

Subject: Applied Thermodynamics I I

<u>No</u>	<u>Title</u>	<u>Week No.</u>
1	Application of steady flow energy equation, Reversible and in reversible processes	<u>1-2</u>
2	Heat engine reversed heat engine, Heat pump	<u>3-4</u>
3	Second law of thermodynamics, Cycle / Carnot cycle	<u>5-6</u>
4	Reversed Carnot cycle, Entropy / clauses in quality, Entropy	<u>6-7</u>
<u>5</u>	reversed processes, Entropy in reversed processes with heat transfer, Entropy	<u>7-9</u>
<u>6</u>	irreversible processes, Entropy in irreversible processes with heat transfer	<u>9-11</u>
<u>7</u>	Gases mixtures / Dalton's law	<u>11-13</u>
<u>8</u>	Avogadro's law/ adiabatic mixing of gases	<u>13-15</u>

Subject: Mechanical Drawing

<u>No</u>	<u>Title</u>	<u>Week No.</u>
1	البراعي (انواع البراعي)، الربط بواسطة البراعي (برغي و صاموله)، الربط بواسطة برغي فقط، الخوابير.	<u>1-2</u>
2	المسامير، البراشيم	<u>3-4</u>

3	التفاوتات، التوافقات، علامات التشغيل	5-6
4	اللحام، النوايض.	6-7
5	التجميع (رسم مقطع امامي كامل لمجمع و مسقط جانبي لتمارين معين)، التجميع	7-9
6	جزء منظومة ميكانيكية)، التجميع (مسقط امامي نصف مقطوع لأجزاء منظومة ميكانيكية)، التجميع (رسم مقطع امامي و مسقط امامي لاجزاء منظومة ميكانيكية)، التروس : انواعها و تطبيقاتها	9-11
7	التروس الاسطوانية العدلة : رسم الترس و رسم التعشيق، التروس المخروطية	11-13
8	رسم، التروس المخروطية : تعشيق، الدودة و الدولاب الدودي، الرسم التفصيلي	13-15

Subject: Fluid Mechanics II

<u>No</u>	<u>Title</u>	<u>Week No.</u>
1	Dimensional analysis and similarity	1-4
2	motion of viscous fluid in conduits / and definition of boundary layer	4-9
3	Friction losses in pipe, Measurements of fluid flow	9-12
4	Analysis of piping system.	12-15

Subject: Applied Mathematics II

<u>No</u>	<u>Title</u>	<u>Week No.</u>
1	Complex numbers, Tangent, Demon theorem, Series solutions, Tests, Cramer basic	1-2
2	Power series	3-4
3	Taylor and maclorrian series, Ordinary differential equations	5-6
4	1st order solution, 2nd order solution, Linear system of differential equation	6-7
5	1st and 2nd order	7-9

	with the constant coefficient	
<u>6</u>	Eigen problems	<u>9-11</u>
<u>7</u>	Numerical solutions of O. D. E.	<u>11-13</u>
<u>8</u>	Euler method, Range cute method.	<u>13-15</u>

Syllabus of Third year-First semester

Subject: Engineering Analyses

<u>No</u>	<u>Title</u>	<u>Week No.</u>
1	Limits	<u>1-2</u>
2	Continuity	<u>3-4</u>
3	Differentiation, Cauchy theorem, Trigonometric function problem.	<u>5-6</u>
4	Logarithmic function, Exponential function	<u>6-7</u>
<u>5</u>	Hyperbolic function, Complex integration	<u>7-9</u>
<u>6</u>	Conformal mapping, Gamma function, Beta function, Error function	<u>9-11</u>
<u>7</u>	Laplace transformation, Inverse Laplace trans	<u>11-13</u>
<u>8</u>	ODE and applications, Initial value	<u>13-15</u>

Subject: Manufacturing Processes

<u>No</u>	<u>Title</u>	<u>Week No.</u>
1	Advanced Welding Hydrogen gas welding & Inert gas welding	<u>1-2</u>
2	Electron Beam & Explosive Welding	<u>3-4</u>
3	Numerical Control (NC)	<u>5-7</u>
4	Computer aided Manufactories	<u>7-10</u>
<u>5</u>	(CAM)	<u>10-15</u>

Subject: Internal Combustion Engine I

<u>No</u>	<u>Title</u>	<u>Week No.</u>
1	Introduction, Details of Engine Parts, Four-Stroke Engines	<u>1-2</u>
2	Two-Stroke Engines	<u>3-4</u>
3	Engine Operating Characteristics	<u>5-6</u>
4	Introductory Thermodynamic Concepts	<u>6-7</u>
<u>5</u>	Air-Standard Cycles, Valve Timing	<u>7-9</u>
<u>6</u>	Fuel-Air Cycles, Actual Cycles	<u>9-11</u>
<u>7</u>	Thermo –chemistry and Fuels	<u>11-13</u>
<u>8</u>	Ignition Systems	<u>13-15</u>

Subject: Gas dynamics

<u>No</u>	<u>Title</u>	<u>Week No.</u>
1	Gases and perfect gas, compressibility, bulk modulus	<u>1-2</u>
2	Continuity equation	<u>3-4</u>
3	Continuity equation	<u>5-6</u>
4	Momentum equation, Momentum equation	<u>6-7</u>
<u>5</u>	System and control volume, Speed of sound, Mach number	<u>7-9</u>
<u>6</u>	Sub sonic flow, incompressible flow, Sonic flow, supersonic flow	<u>9-11</u>
<u>7</u>	Stagnation state, critical state, Nozzle and diffuser, Isentropic flow, choking, Shock waves	<u>11-13</u>
<u>8</u>	Isentropic flow, Adiabatic flow in constant area ducts, Rocket, Turbo jet engine, Adiabatic flow in constant area duct	<u>13-15</u>

Subject: Theory of Machine I

<u>No</u>	<u>Title</u>	<u>Week No.</u>
1	Toothed gearing Gyroscopic couple and processional motion	<u>1-2</u>
2	Turning moment diagrams and flywheel	<u>3-4</u>
3	Governors	<u>5-6</u>
4	Cams	<u>6-10</u>
<u>5</u>	Universal joint (Hooks).	<u>10-15</u>
<u>6</u>	Gear trains	<u>9-11</u>

Syllabus of Third year-Second Semester

Subject: Numerical Analyses

<u>No</u>	<u>Title</u>	<u>Week No.</u>
1	Differential equations, classification of differential equations, equation of first order and first degree, solution of equation- Separable Equations	<u>1-2</u>
2	Homogenous equation- linear equation	<u>3-4</u>
3	Partial differential equations	<u>5-6</u>
4	Equations forming	<u>6-7</u>
<u>5</u>	Solution of wave equations	<u>7-9</u>
<u>6</u>	Solution of heat equations	<u>9-11</u>
<u>7</u>	Solution by Laplace transformation, Numerical method	<u>11-13</u>
<u>8</u>	Finite method, Solution method.	<u>13-15</u>

Subject: Electrical Machinery Fundamentals

<u>No</u>	<u>Title</u>	<u>Week No.</u>
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1	Introduction to Machinery Principles	<u>1-2</u>
2	DC Machinery Fundamentals	<u>3-4</u>
3	DC Motors and Generators, AC Machinery Fundamentals	<u>5-6</u>
4	Synchronous Generators.	<u>6-7</u>
<u>5</u>	Synchronous Generators	<u>7-9</u>
<u>6</u>	Synchronous Motors	<u>9-11</u>
<u>7</u>	Induction Motors	<u>11-13</u>
<u>8</u>	Transformers.	<u>13-15</u>

Subject: Computer Aided Design(CAD/CAM)

<u>No</u>	<u>Title</u>	<u>Week No.</u>
1	General introduction CAD, Design process and application of cad, Geometric modeling, Design software package	<u>1-2</u>
2	Modeling techniques	<u>3-4</u>
3	Stress analysis	<u>5-6</u>
4	Read information by using OBD techniques	<u>6-7</u>
<u>5</u>	Applications and CNC machine and link it with the pc. Read G/cod	<u>7-9</u>
<u>6</u>	Programming the solution and example, Element of CAD/CAM interstate	<u>9-11</u>
<u>7</u>	Surfcam program	<u>11-13</u>
<u>8</u>	Modify a current code, Applications.	<u>13-15</u>

Subject: Internal Combustion Engine II

<u>No</u>	<u>Title</u>	<u>Week No.</u>
1	Combustion in SI Engines, Detonation and Octane Number	<u>1-2</u>
2	Combustion in CI	<u>3-4</u>

	Engines, Detonation and Cetane Number, Carburetion	
<u>3</u>	Simple Carburetors, Calculation for AF	<u>5-6</u>
<u>4</u>	Superchargers, Turbochargers, Electronic Fuel Control	<u>6-7</u>
<u>5</u>	Components of a Fuel Injection Systems, Engine management, Engine Testing and Control	<u>7-9</u>
<u>6</u>	Heat Transfer in Engines	<u>9-11</u>
<u>7</u>	Friction and Lubrication System	<u>11-13</u>
<u>8</u>	Overall Engine Performance	<u>13-15</u>

Subject: Turbo Machinery

<u>No</u>	<u>Title</u>	<u>Week No.</u>
<u>1</u>	Units and dimensions, Theory of turbomachinery	<u>1-2</u>
<u>2</u>	Theory of turbomachinery	<u>3-4</u>
<u>3</u>	Thrust force, impulse turbine	<u>5-6</u>
<u>4</u>	Thrust force, impulse turbine, Reaction turbine	<u>6-7</u>
<u>5</u>	Pumps and blowers, Pumps and blowers	<u>7-9</u>
<u>6</u>	Pumps and blowers, Specific speed	<u>9-11</u>
<u>7</u>	compression, Centrifugal compressor	<u>11-13</u>
<u>8</u>	Wind turbine, Similarity, Turbine of tidal energy.	<u>13-15</u>

Subject: Theory of Machine II

<u>No</u>	<u>Title</u>	<u>Week No.</u>
<u>1</u>	Toothed gearing	<u>1-2</u>

2	Gear trains, Gyroscopic couple and precessional motion	<u>3-4</u>
3	Turning moment diagrams and flywheel	<u>5-6</u>
4	Governors	<u>6-7</u>
<u>5</u>	Cams	<u>7-10</u>
<u>6</u>	Universal joint (Hooks).	<u>10-15</u>

Syllabus of Fourth year-First Semester

Subject: Mechanical Vibrations I

<u>No</u>	<u>Title</u>	<u>Week No.</u>
1	Basic concepts of vibration, Introduction to oscillatory motion, Free vibration of an undamped single degree of freedom, Simple energy method (Raleigh principle), Free vibration viscous damped single degree of freedom system, Equivalent springs and dampers	<u>1-2</u>
2	Logarithmic decrement. Forced vibration of single degree of freedom, Forced vibration for constant force, Forced Vibration for sinusoidal force, Rotating unbalance, Support motion example, Vibration isolation, Vibration measuring instrument	<u>3-4</u>
3	, Two degree of freedom. Mode shapes, Lagrange equation, Dynamic absorber (undamped), Study and formulate the eq. of dynamic absorber and its characteristics	<u>5-6</u>

4	, Multiple degree of freedom, Influence coefficient matrix and stiffness matrix, Eigen values and Eigen vectors	<u>6-7</u>
<u>5</u>	Torsional vibration, Torsional vibration for stepped shaft, Vibration of continuous system	<u>7-10</u>
<u>6</u>	Rayleigh method for estimation the fundamental natural frequency, Dunkerley method to find Ist natural.	<u>10-15</u>

Subject: Refrigeration and Air Conditioning I

<u>No</u>	<u>Title</u>	<u>Week No.</u>
1	Introduction to AC & measuring unit, Properties of moist air, Humidity calculations Dalton's law &	<u>1-2</u>
2	Psychrometric chart &Psychrometric process	<u>3-4</u>
3	Heat transfer principles	<u>5-6</u>
4	Overall heat transfer coefficient & wall surface temperature	<u>6-7</u>
<u>5</u>	Comfort conditions, Cooling load calculation, Heating load calculations	<u>7-10</u>
<u>6</u>	Fluid flow through ducts and air distribution.	<u>10-15</u>

Subject: Engineering Materials

<u>No</u>	<u>Title</u>	<u>Week No.</u>
1	Introduction to Engineering Materials, Atomic structure and atomic bonding	<u>1-2</u>
2	The Structure of Crystalline Solids, Imperfections in solids	<u>3-4</u>
3	Dislocation and Strengthening Mechanisms	<u>5-6</u>
4	Mechanical properties, Failure of Materials (fatigue, Fracture, and Creep).	<u>6-7</u>
<u>5</u>	Diffusion, Ceramics, Polymers, Metals, Composite Materials	<u>7-10</u>
<u>6</u>	Nanomaterials, Conductors and semiconductors and insulators.	<u>10-15</u>

Subject: Machine Design

<u>No</u>	<u>Title</u>	<u>Week No.</u>
1	introduction to machine design element	<u>1-2</u>
2	Review of stress and strain	<u>3-4</u>
3	Factor of safety and design codes, Stress Concentration	<u>5-6</u>
4	Static Failure Theories, Fatigue Stresses	<u>6-7</u>
<u>5</u>	Design of welded joint	<u>7-10</u>
<u>6</u>	Screws and Fasteners, Pressure vessels	<u>10-15</u>

Subject: Industrial Engineering and Quality Control

<u>No</u>	<u>Title</u>	<u>Week No.</u>
1	Linear programming (L.P), Transportation and Assignment models, Network planning	<u>1-2</u>
2	Sequencing models	<u>3-4</u>

3	Replacement and maintenance models, Inventory models.	<u>5-6</u>
4	SO (Total quality management (TQM and ISO:9000), Quality control, Reliability	<u>6-7</u>
<u>5</u>	Failure function	<u>7-10</u>
<u>6</u>	Combined series - parallel system and high-level and low-level redundancy.	<u>10-15</u>

Subject: Power Plant I

<u>No</u>	<u>Title</u>	<u>Week No.</u>
1	Introduction to power plant cycles, Power system Economics, Rankine cycle	<u>1-2</u>
2	Power station superheated processes, Power station reheated processes	<u>3-4</u>
3	Power station regenerative processes, Open feed water - close backward feed water.	<u>5-6</u>
4	close forward heater, Boiler operation (water tube, fire tube), Water circulation in boiler	<u>6-7</u>
<u>5</u>	Steam turbine, impulse turbine, Reaction turbine condensers	<u>7-10</u>
<u>6</u>	Circulation of water system, Cooling tower classification, Cooling tower operation, Pumping system	<u>10-15</u>

Syllabus of Fourth year-Second Semester

Subject: Refrigeration and Air Conditioning I I

<u>No</u>	<u>Title</u>	<u>Week No.</u>
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1	Duct design (pressure drop method, velocity method, static regain method)	<u>1-2</u>
2	Fans Design of piping system, Introduction to refrigeration	<u>3-4</u>
3	Carnot engine & ravines Carnot cycle	<u>5-6</u>
4	Ideal & actual vapors compression refrigeration cycle	<u>6-7</u>
<u>5</u>	compression refrigeration cycle	<u>7-10</u>
<u>6</u>	Refrigerants, refrigeration system components	<u>10-15</u>

Subject: Design of machine system

<u>No</u>	<u>Title</u>	<u>Week No.</u>
1	Pipe and pipe Joints, Power Screw, Spring Design	<u>1-2</u>
2	Coupling	<u>3-4</u>
3	Bearing	<u>5-6</u>
4	Shafts, Key Belt Drive	<u>6-7</u>
<u>5</u>	Gear Design	<u>7-10</u>
<u>6</u>	Machine design system	<u>10-15</u>

Subject: Power Plant II

<u>No</u>	<u>Title</u>	<u>Week No.</u>
1	Gas turbine power plant principles, Classification of gas turbine and operation, Air compressor (classification and operation)	<u>1-2</u>
2	Axial compressors, Centrifugal compressors, Combustion chamber principles	<u>3-4</u>
3	Combustion chamber efficiency and performance	<u>5-6</u>
4	Nuclear power plants principles, Operation of nuclear power plants,	<u>6-7</u>

	Classification of nuclear power plants	
<u>5</u>	Pressurized water reactor (PWR), Boiling water reactor (BWR), Hydropower plants principles	<u>7-10</u>
<u>6</u>	Hydropower plants operation, Nonconventional power plants.	<u>10-15</u>