Mechatronics Engineering Lectures

Subject: Design of Machine Elements **Class:** Third

Lecture Contents:	**Name: Dr. F.Q. Yahya**		**Lecture number:2**	
	Topics: **1-The nature of mechanical design**			
	Contents: **1-Preferred basic sizes, screw threads and standard shapes** **2-Sample design calculation** **3-Metric screw threads** **4-Steel structural shapes** **5-Unit systems**			

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Lecture Contents:	**Name: Dr. F.Q. Yahya**		**Lecture number:3**	
	Topics: **1-Materials in Mechanical Design**			
	Contents: **1-Properties of Materials** **2-Tensile Strength** **3-Yield Strength** **4-Proportional Limit** **5-Elastic Limit** **6-Modulus of Elasticity in Tension** **7-Ductility and Percent Elongation** **8-Shear Strength** **9-Poisson's Ratio** **10-Modulus of Elasticity in Shear**			

اسم التدريسي رقم الهاتف عنوان البريد الاليكتروني

Mechatronics Engineering Lectures

Subject: Design of Machine Elements **Class:** Third

Lecture Contents:	**Name: Dr. F.Q. Yahya**		**Lecture number:4**	
	Topics: **1- Materials in Mechanical Design**			
	Contents: **1- Properties of Materials** **2- Mechanical properties** **3- Flexural Modulus** **4- Hardness** **5- Machinability** **6- Toughness, lmpact Energy** **7- Fatigue Strength or Endurance Strength** **8- Creep** **9- Relaxation** **10- Physical Properties** **11- Density** **12- Coefficient of Thermal Expansion** **13- Thermal Conductivity** **14- Electrical Resistivity** **15- Example**			

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Lecture Contents:	**Name: Dr. F.Q. Yahya**		**Lecture number:5**	
	Topics: **1- Materials in Mechanical Design**			
	Contents: **1-Classification of Metals and Alloys** **2-Variability of Material Properties Data** **3- Carbon and Alloy Steel** **4- Designation Systems** **5- Importance of Carbon** **6- Alloy Groups** **7- Examples of the Relationships between AlSl and UNS Numbering systems**			

Mechatronics Engineering Lectures

Subject: Design of Machine Elements **Class:** Third

Lecture Contents:	**Name: Dr. F.Q. Yahya**		**Lecture number:6**	
	Topics: **1- Materials in Mechanical Design**			
	Contents: **1- Conditions for steels and heat treatment** **2- Heat Treating** **3- Annealing** **4- Normalizing** **5- Through-hardening and Quenching and Tempering** **6- Case Hardening**			

Mechatronics Engineering Lectures

Subject: Design of Machine Elements **Class:** Third

Lecture Contents:	**Name: Dr. F.Q. Yahya**		**Lecture number:7**	
	Topics: **1-Stress and Deformation Analysis**			
	Contents: **1-Philosophy of a safe design** **2-Representing stresses on a stress element** **3-Direct stresses: tension and compression** **4-Deformation under direct axial loading** **5-Direct shear stress** **6-Relationship among torque, power, and rotational speed** **7-Torsional shear stress** **8-Torsional deformation** **9-Examples**			

Mechatronics Engineering Lectures

Subject: Design of Machine Elements **Class:** Third

Lecture Contents:	**Name: Dr. F.Q. Yahya**		**Lecture number:8**	
	Topics: **1- Stress and Deformation Analysis**			
	Contents: **1-Torsion in members having noncircular cross sections** **2-Torsion in closed, thin-walled tubes** **3-Open tubes and a comparison with closed tubes** **4-Vertical shearing stress** **5-Special shearing stress formulas** **6-Stress due to bending** **7-Flextural center for beams** **8-Examples**			

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Lecture Contents:	**Name: Dr. F.Q. Yahya**		**Lecture number:9**	
	Topics: **1- Stress and Deformation Analysis**			
	Contents: **1- Beam deflections** **2- Equations for deflected beam shape** **3- Beams with concentrated bending moments** **4-Examples**			

Mechatronics Engineering Lectures

Subject: Design of Machine Elements **Class:** Third

Lecture Contents:	**Name: Dr. F.Q. Yahya**		**Lecture number:10**	
	Topics: **1- Stress and Deformation Analysis**			
	Contents: **1-Combined normal stresses: superposition principle** **2-Stress concentrations** **3- Notch sensitivity and strength reduction factor** **4-Examples**			