Course Specifications
Programme(s) on which the course is given  all programmes
Major or Minor element of programmes  Major
Department offering the programme  Engineering Mathematic and Physic
Department offering the course  Engineering Mathematic and Physic
Academic year / Level  preparatory
Date of specification approval

A- Basic Information
Title: Engineering Mechanics 1(A)  Code: Mech003
Credit Hours:  Lecture: 2
Tutorial: 2  Practical: none  Total: 4

B- Professional Information
1 – Overall Aims of Course
  1-Utilization of two and three dimension vectors
  2-Solving problem of force resultant in two and three dimensions
  3- Solving problem of equilibrium in two and three dimension
  4- Solving friction problems
  5 - Solving structure problems

2 – Intended Learning Outcomes of Course (ILOs)
  a- Knowledge and Understanding:
    a1-Identify scalars and vectors ……

    a2-Identify the resultant vector and component of vectors on vector diagrams
a3- Define particle and rigid bodies

A4 Use free bodies diagrams and vector analyses to determine the sum of the forces acting at a single point on an object

A5- Define torque and identify situations involving the application of torque

A6- Define rotational equilibrium

a7- Define static equilibrium

A8- Identify different types of support and hinges

a9 - Identify different types of surfaces

A10- Identify different types of friction

a11- Define internal forces of structures

b- Intellectual Skills

b1- Write vector equations describing the vector addition of two or more velocities or displacement……

b2 - Write vector equations describing the subtraction of two velocities

b3- Use graphical method to resolve vector into two perpendicular components

b4- Resolve vector into component using trigonometry

b5- Use graphical method or trigonometry to add or subtract vectors

b6 Solve problems for common objects in translational equilibrium

b7-Solve problems involving

I-torque

II-force

III-lever arm

b8- Determine the sum of the forces and the torque on an object

b9- Demonstrate that in static equilibrium, any location can by chosen as the pivot point
b10-Solve problem for common object static equilibrium

B11- Determine resultant of forces in two dimensions graphically

b12- Determine resultant of forces in two and three dimensions

Analytically

b13- Solve equilibrium problems in two and three dimensions

b14- Determine reaction

b15- Determine friction force

b16- Determine Internal force of structure

c- Professional and Practical Skills

c1- Differentiate between particle, rigid, body and plastic bodies' assumptions

c2- Differentiates between different types of supports and hinges

c3- Disassemble structure into its elements

c4- Design model for project

c5- Create project model

c6- Formulate laws and formulas of the proposed model

d- General and Transferable Skills

d1- Gather and organize data, produce and interpret graphs, and determine relationships between variables

d2- Preparation of report in a standard format

d3- Research for information sources

3- Contents

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<th>Topic</th>
<th>No. of hours</th>
<th>Lecture</th>
<th>Tutorial/Practical</th>
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4– **Teaching and Learning Methods**

4.1-Lectures: theoretical coverage and problem solving techniques

4.2-Solution of problems presented during classes

4.3-Practising through problem solving in lectures and classes

4.4-Project (practical thinking)

5- **Student Assessment Methods**

5.1 mid-term to assess (a₁ to a₁₁, b₁ to b₁₆ and c₁ to c₆).

5.2 activities in lectures to assess (a₁ to a₁₁, b₁ to b₁₆ ,c₁ to c₆ and d₁ to d₃).

5.3 activities in classes to assess (a₁ to a₁₁, b₁ to b₁₆, c₁ to c₆ and d₁ to d₃).

5.4 project. to assess (a₁ to a₁₁, b₁ to b₁₆, c₁ to c₆ and d₁ to d₃).

5.5 final-term exam to assess (a₁ to a₁₁, b₁ to b₁₆ , c₁ to c₆ and d₁ to d₃).

**Assessment Schedule**

- Assessment 1 mid-term exam  Week 10
- Assessment 2 activities in lectures  continuous
- Assessment 3 activities in classes  continuous
- Assessment 4 project.  Week 22(post term conclusion)
- Assessment 5 final-term exam  Week 28 (with Dynamics course)
Weighting of Assessments

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<td>Semester Work</td>
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Any formative only assessments

6- List of References

6.1 - Course Notes

Submitted to student every lecture (ppt presentation)

6.2 - Essential Books (Text Books)

Beer and Johnston, Vector Mechanics, Statics

6.3 Recommended books

- Merriam and I Glenn Kraig, engineering mechanics, volume 1, static, 4th edition
- Russell c Hibbeler engineering mechanics static
- Shames, engineering mechanics, static
- Weily, engineering mechanics, static

6.4 - Periodicals, Web Sites, etc

- yahoo email group
7- Facilities Required for Teaching and Learning

- data show and screen
- blackboard
- virtual lab.

Course Coordinator: Dr. Hazem H. Sharaf El-Din

Head of Department: Prof. Dr. Magdy Hanna

Date: / /