



AL IMAM MOHAMMAD IBN SAUD ISLAMIC UNIVERSITY  
COLLEGE OF ENGINEERING  
Department of Mechanical Engineering

| Course Information    |  |
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| Course Code and Name: | ME331 Mechanics of Machines              |
| Credit Hours:         | 3 (3 Lecture + 1 Tutorial)               |
| Prerequisites:        | MATH 226 Linear Algebra, GE 202 Dynamics |

| Course Description   |
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| Position, velocity and acceleration analysis of linkages using graphical and analytical methods; cam profile design; gears and gear trains; dynamic force analysis; balancing of rotating and reciprocating masses; cam and reciprocating engine dynamics; flywheels and gyroscopes. |

| Textbook  |   |                  |                               |
|-----------|---|------------------|-------------------------------|
| Title     | Design of Machinery: an introduction to the synthesis and analysis of mechanisms and machines |                  |                               |
| Authors   | Robert L. Norton  |                  |                               |
| Publisher | McGraw Hill   | Year and Edition | 2012, 5 <sup>th</sup> Edition |

| Course Contents  |
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| Introduction to mechanics of machines, types of motion, and calculations of degrees of freedom (DOF)       |
| Inversions of kinematic chains, classification of planar mechanisms and calculations of transmission angle |
| Graphical linkage synthesis  |
| Analytical position analysis   |
| Graphical velocity analysis  |
| Instant center of velocity   |
| Analytical velocity analysis   |
| Graphical acceleration analysis  |
| Analytical acceleration analysis   |
| Dynamic force analysis   |
| Dynamic force analysis and Review of course  |

| Academic Coordinator | Signature |
|----------------------|-----------|
| Dr. Khalil Hajlaoui  |           |



Official Stamp