



## Course Specifications

<b>Course Title:</b>	<b>Mechanics</b>
<b>Course Code:</b>	<b>MATH 2290</b>
<b>Program:</b>	<b>Bachelor of Science in Mathematics</b>
<b>Department:</b>	<b>Mathematics</b>
<b>College:</b>	<b>College of Science and Humanities Alkharj</b>
<b>Institution:</b>	<b>PRINCE SATTAM BIN ABDUALZIZ UNIVERSITY</b>

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## A. Course Identification

<b>1. Credit hours:</b>	<b>4(4,0,0)</b>
<b>2. Course type</b>	
a.	University <input type="checkbox"/> College <input type="checkbox"/> Department <input checked="" type="checkbox"/> Others <input type="checkbox"/>
b.	Required <input checked="" type="checkbox"/> Elective <input type="checkbox"/>
<b>3. Level/year at which this course is offered:</b>	<b>Level 5</b>
<b>4. Pre-requisites for this course (if any):</b>	MAT 1060
<b>5. Co-requisites for this course (if any):</b>	None

### 6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	04	100%
2	Blended		
3	E-learning		
4	Distance learning		
5	Other		

### 7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	Lecture	48
2	Laboratory/Studio	0
3	Tutorial	0
4	Others (specify) – (5 Office Hours in a week)	60
	<b>Total</b>	<b>108</b>

## B. Course Objectives and Learning Outcomes

### 1. Course Description

Statics: Force as a vector – Vector Algebra - Free-body Diagrams – Coplanar Forces – Couples.  
 Dynamics: Kinematics – Rectilinear Motion – Position Vector – Velocity and Acceleration – Graphical Methods– Relative Motion – Curvilinear Motion - Velocity and Acceleration in 2- D and 3- D – Applications on Curvi Linear Motion. Kinetics: Newton's 2nd Law – Principle of Work and Kinetic Energy – Principle of Impulse and Momentum – Central Force – Impact – Vibrations.

### 2. Course Main Objective

- The course aims to provide all basic concepts of Mechanics and application of Mathematics to Mechanics (Both Statics and Dynamics)
- Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)
- Delivering lectures through computer aided drawings to help students have better understanding of the concepts.

Course will be reviewed based on the report received from Course Coordinators and curriculum review committee

### 3. Course Learning Outcomes

CLOs		Aligned PLOs
1	<b>Knowledge and Understanding</b>	
1.1	Recall vector and scalar quantities	K1
1.2	Understand the concept of dot and cross product of vectors	K3
2	<b>Skills :</b>	
2.1	Use vector calculus to calculate velocity, acceleration etc	S1
2.2	Use theorems on forces to solve problems	S1
2.3	Use concept of curvilinear motion and solve simple applications	S3

### C. Course Content

No	List of Topics	Contact Hours
1	Review of Vector Algebra	4
2	Forces – Coplanar Forces – Couples	6
3	Kinematics basics	4
4	Velocity and Acceleration, Relative Motion	6
5	Curvilinear Motion – Velocity and Acceleration	4
6	Application of Curvilinear Motion	6
7	Newtons Laws of Motion	6
8	Principle of Work and Energy	4
9	Impulse and Momentum	4
10	Impact and Vibrations	4
<b>Total</b>		48

### D. Teaching and Assessment

#### 1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	<b>Knowledge and Understanding</b>		
1.1	Recall vector and scalar quantities	1. Class Room Lectures 2. Interactive sessions 3. Exclusive Office Hours for clearing doubts in small groups	1. Two Internal Exams
1.2	Understand the concept of dot and cross product of vectors		2. At least two Quiz 3. End Semester Exam
2.0	<b>Skills</b>		
2.1	Use vector calculus to calculate velocity, acceleration etc	1. Application oriented exercises 2. Homework to improve the analytical skills	1. Homework 2. Assignments
2.2	Use theorems on forces to solve problems		3. Quiz
2.3	Use concept of curvilinear motion and solve simple applications		4. Exams

#### 2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Mid Term Exam I	6	20%

#	Assessment task*	Week Due	Percentage of Total Assessment Score
2	Quiz	4 & 10	5%
3	Mid Term Exam II	13	20%
4	Continuous Assessment – Homework, Assignment, Attendance etc.	--	5%
5	End Semester Exam	15	50%

\*Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

## E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

1. Exclusive Office Hours – 5 Hours per week
2. Academic Advising for Students – 1 Hour per week

## F. Learning Resources and Facilities

### 1. Learning Resources

<b>Required Textbooks</b>	- R. C. Hibbeler, "Engineering Mechanics: Statics And Dynamics", <i>Upper Saddle River, NJ.: Prentice Hall, 2001, ISBN: 0130200069.</i> L. Bostock, S. Chandler, "Applied Mathematics", Stanley Thornes (Publisher) Ltd. 2002	- Robert R - JP Jain - Age Intern - Samuel S - Jean Gal
<b>Essential References Materials</b>	NIL	Paul's onl
<b>Electronic Materials</b>	NIL	
<b>Other Learning Materials</b>	Lecture Notes Prepared by the Department of Mathematics	Lecture N

### 2. Facilities Required

Item	Resources
<b>Accommodation</b> (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classrooms with Smart boards with seating facilities for at least 30 students
<b>Technology Resources</b> (AV, data show, Smart Board, software, etc.)	Smartboard, Internet Connection for Blackboard Computer Lab with software packages such as Excel etc.
<b>Other Resources</b> (Specify, e.g. if specific laboratory	Nil

Item	Resources
equipment is required, list requirements or attach a list)	

### G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Course Evaluation	Quality Assurance Committee of the Department	Review all the course documents and course report
Peer Review	Senior Faculty Members / HoD	Attend the lecture and fill in a form
End Semester online survey	students	online survey

**Evaluation areas** (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)

**Evaluators** (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

**Assessment Methods** (Direct, Indirect)

### H. Specification Approval Data

Council / Committee	
Reference No.	
Date	