

## Program Engineering

<b>Specialization</b>	<b>Civil Engineering/Building &amp; Constructions</b>
<b>Course Number</b>	<b>20112241</b>
<b>Course Title</b>	<b>Design Fundamentals</b>
<b>Credit Hours</b>	<b>2</b>
<b>Theoretical Hours</b>	<b>2</b>
<b>Practical Hours</b>	<b>0</b>

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### **Brief Course Description:**

- ❖ **Properties of Concrete and Steel. Ultimate Strength Design. Flexural analysis of R.C sections. Design Beam for bending Singly and Doubly reinforced sections. T-sections and other shapes. Shear and Torsion Design. One-Way solid and ribbed slabs. Design of axially loaded short columns, Design of Footings, Design of Steel structures, compression and tension members.**

### **Course Objectives:**

**Upon the completion of the course, the student will be able to:**

- 1. Study the properties and behavior of reinforced concrete components**
- 2. Design different types of reinforced concrete members**
- 3. Use the ultimate strength design method**
- 4. Understand the behavior of steel members**
- 5. Design different types of steel members**

**Detailed Course Description:**

<b>Unit Number</b>	<b>Unit Name</b>	<b>Unit Content</b>	<b>Time Needed</b>
<b>1.</b>	<b>Introduction</b>		
<b>2.</b>	<b>Properties of R.C materials</b>		
<b>3.</b>	<b>Ultimate Strength Design</b>		
<b>4.</b>	<b>Flexural Design of R.C sections</b>		
<b>5.</b>	<b>Design of Beams sections (T-sec, rec, L-sec)</b>		
<b>6.</b>	<b>Design of Shear and Torsion</b>		
<b>7.</b>	<b>Design of Slabs(solid, ribbed)</b>	<b>Design of one way simply supported ribbed slabs</b>	
<b>8.</b>	<b>Design of Columns and Footings</b>	<b>Axially loaded short columns</b>	
<b>9.</b>	<b>Development Length</b>		
<b>10.</b>	<b>Design of Steel</b>	<b>Tension and Compression members</b>	

### Evaluation Strategies:

Exams		Percentage	Date
Exams	First Exam	20%	--/--/---
	Second Exam	20%	--/--/---
	Final Exam	50%	--/--/---
Homework and Projects		10%	
Discussions and lecture Presentation			

### Teaching Methodology:

Lectures

### Textbooks & References:

**Reinforced Concrete Mechanics and Design, James G. Mac Gregor  
fourth Edition**

**Structural Steel Design, Jack C. Mc Cormac  
Fourth Edition**

### References:

**1) Reinforced Concrete a fundamental approach, Fifth Edition. 2002  
by Nawy.E.**

2) تصميم المنشآت الخرسانية والمنشآت مسبقة الإجهاد، د. علاء التميمي 1998  
3) كودة الأحمال والقوى، وزارة الأشغال العامة عمان 2001