



# Course Specification

(Bachelor)

**Course Title:** Creativity and Innovation

**Course Code:** 5204-GE-2

**Program:** Bachelor in Mechanical Engineering

**Department:** Mechanical Engineering

**College:** College of Engineering

**Institution:** King Khalid University, Abha, Saudi Arabia

**Version:** 10

**Last Revision Date:** 8 Mar 2025

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## A. General information about the course:

### 1. Course Identification

#### 1. Credit hours:( 2 )

2L + 0 P = 2

#### 2. Course type

A. University College Department Track Others

B. Required Elective

#### 3. Level/year at which this course is offered: (4th/2nd)

#### 4. Course general Description:

Creativity and innovation are integral to an organization's ability to survive and thrive in today's competitive marketplace. The main purpose of the course is to provide ample training and exposure to the students to be able to work independently and innovatively in new projects and work assignments. The specific aim is to inculcate innovation based thinking ability to approach professional challenges.

#### 5. Pre-requirements for this course (if any): NIL

#### 6. Pre-requirements for this course (if any): NIL

#### 7. Course Main Objective(s):

This course covers and concentrates on principles of material science such as atomic structure and interatomic bonding, crystal structure of materials, theory of diffusion, imperfections in crystals, mechanical testing and evolution of materials, phase diagram and cooling curves of metals and alloys, iron-carbide diagram for steel and cast iron.

### 2. Teaching mode (mark all that apply)

| No | Mode of Instruction  | Contact Hours | Percentage |
|----|--|---------------|------------|
| 1  | Traditional classroom  | 30            | 100        |
| 2  | E-learning   |               |            |
| 3  | Hybrid <ul style="list-style-type: none"> <li>● Traditional classroom</li> <li>● E-learning</li> </ul> |               |            |
| 4  | Distance learning  |               |            |



### 3. Contact Hours (based on the academic semester)

| No           | Activity          | Contact Hours |
|--------------|-------------------|---------------|
| 1.           | Lectures          | 30            |
| 2.           | Laboratory/Studio |               |
| 3.           | Field             |               |
| 4.           | Tutorial          |               |
| 5.           | Others (specify)  |               |
| <b>Total</b> |                   | <b>30</b>     |

### B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

| Code | Course Learning Outcomes   | Code of CLOs aligned with program | Teaching Strategies | Assessment Methods                        |
|------|--|-----------------------------------|---------------------|---|
| 1.0  | Knowledge and understanding  |                                   |                     |   |
| ...  |  |                                   |                     |   |
| 2.0  | Skills   |                                   |                     |   |
| 2.1  | Combine the roles of skill, experience, motivation and culture in creative endeavor  | KLO9                              | Lectures            | Quizzes<br>Midterm<br>Assignment          |
| 2.2  | Illustrate some potential disruptive innovations and take advantage of 'open' innovation   | KLO9                              | Lectures            | Quizzes<br>Midterm<br>Assignment<br>Final |
| 2.3  | Develop case study analysis skills (specifically, identifying critical issues in case studies and applying course material to case studies). | KLO9                              | Lectures            | Quizzes<br>Midterm<br>Assignment<br>Final |
| 2.4  | Investigate the process involved in managing creativity or innovation effectively and apply this knowledge to your                           | KLO9                              | Lectures            | Quizzes<br>Midterm<br>Assignment<br>Final |



| Code       | Course Learning Outcomes  | Code of CLOs aligned with program | Teaching Strategies | Assessment Methods                                |
|------------|---|-----------------------------------|---------------------|---|
|            | own creative idea or innovation   |                                   |                     |   |
| 2.5        | Analyze the influence of problem-solving techniques, team processes, and environmental conditions on creativity in organizations. | <b>KLO1</b>                       | <b>Lectures</b>     | <b>Midterm Assignment<br/>Course Presentation</b> |
| <b>3.0</b> | <b>Values, autonomy, and responsibility</b>   |                                   |                     |   |
| 3.1        |   |                                   |                     |   |
| 3.2        |   |                                   |                     |   |
| ...        |   |                                   |                     |   |

### C. Course Content

| No           | List of Topics                                  | Contact Hours |
|--------------|---|---------------|
| 1.           | Introductions to creativity and innovation      | 2             |
| 2.           | Driving Strategic Innovation                    | 4             |
| 3.           | Clock Speed & Strategic Value Chain Dynamics    | 4             |
| 4.           | Business Model Innovation (BMI)                 | 4             |
| 5.           | Innovation Dynamics                             | 4             |
| 6.           | Creating Innovation Culture                     | 6             |
| 7.           | Innovation Entrepreneurial Firm & Virtuoso Team | 6             |
| <b>Total</b> |   | <b>30</b>     |

### D. Students Assessment Activities

| No | Assessment Activities *             | Assessment timing (in week no) | Percentage of Total Assessment Score |
|----|-------------------------------------|--------------------------------|--------------------------------------|
| 1. | Midterm Exam 1                      | 7-8                            | 15%                                  |
| 2. | Midterm Exam 2                      | 14-15                          | 15%                                  |
| 3. | Quizzes and Assignment/Presentation | 2, 8, 15                       | 30%                                  |
| 4. | Final exam                          | 18                             | 40%                                  |



| No | Assessment Activities * | Assessment timing (in week no) | Percentage of Total Assessment Score |
|----|-------------------------|--------------------------------|--------------------------------------|
| 5. | Total                   |                                | 100%                                 |

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

## E. Learning Resources and Facilities

### 1. References and Learning Resources

|                                 |  |
|---------------------------------|--|
| <b>Essential References</b>     | Boynton, A. and Fischer, B., 2011. The idea hunter: How to find the best ideas and make them happen. John Wiley & Sons.  |
| <b>Supportive References</b>    | Corazza, G.E., Agnoli, S. and Martello, S., 2017. A creativity and innovation course for engineers. In Handbook of research on creative problem-solving skill development in higher education (pp. 74-93). IGI Global. |
| <b>Electronic Materials</b>     |  |
| <b>Other Learning Materials</b> | <ol style="list-style-type: none"> <li>1. Business Model Canvas &amp; Innovation</li> <li>2. Driving Strategic Innovation</li> <li>3. Value Chain Dynamics</li> <li>4. Virtuoso Team</li> </ol>                        |

### 2. Required Facilities and equipment

| Items   | Resources                      |
|---|--------------------------------|
| <b>facilities</b><br>(Classrooms, laboratories, exhibition rooms, simulation rooms, etc.) | <b>Classroom with 50 seats</b> |
| <b>Technology equipment</b><br>(projector, smart board, software)                         | <b>LCD Projector</b>           |
| <b>Other equipment</b><br>(depending on the nature of the specialty)                      |                                |

## F. Assessment of Course Quality

| Assessment Areas/Issues                     | Assessor            | Assessment Methods                          |
|---|---------------------|---|
| Effectiveness of teaching                   | Student and faculty | Indirect through surveys                    |
| Effectiveness of Studentsassessment         | Student and faculty | Indirect through surveys                    |
| Quality of learning resources               | Student and faculty | Indirect through surveys (Student, faculty) |
| The extent to which CLOs have been achieved | Quality Committee   | Direct through Rubrics                      |
| Other                                       |                     |   |

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

**Assessment Methods**(Direct, Indirect)



### G. Specification Approval

|                               |  |
|-------------------------------|--|
| <b>COUNCIL<br/>/COMMITTEE</b> |  |
| <b>REFERENCE NO.</b>          |  |
| <b>DATE</b>                   |  |

