# Course Specification
## (Bachelor)

| | |
|---|---|
| Course Title: | Human Factors Engineering |
| Course Code: | INE 3361 |
| Program: | Bachelor in Industrial Engineering |
| Department: | Industrial Engineering |
| College: | College of Engineering |
| Institution: | King Khalid University |
| Version: | Version 2 |
| **Last Revision Date:** | 11/12/2024 |

## Table of Contents

## A. General information about the course:

### 1. Course Identification

| 1. Credit hours: (2) | | | | | |
|---|---|---|---|---|---|
| | | | | | |
| **2. Course type** | | | | | |
| **A.** | ☐ University | ☐ College | √☐ Department | ☐ Track | ☐ Others |
| **B.** | √☐ Required | | ☐ Elective | | |
| **3. Level/year at which this course is offered: (3th year 6th Level)** | | | | | |
| **4. Course General Description:** | | | | | |
| This course emphasizes the human factor and ergonomics principles affecting Human performance and the basic requirement of workplace and apply ergonomic principles with reference to the workplace to identify various issues related to work disorders such as MSD pain and stress formation, Awareness of functional anatomy of the human body, understanding to carry out the calculation for engineering anthropometry, in addition to design and evaluation of ergonomic systems in Industrial environment in relation to the study of Biomechanics and Manual Strength Design. | | | | | |
| **5. Pre-requirements for this course** (if any): | | | | | |
| **INE 3311- Work Design and Measurement** | | | | | |
| **6. Co-requisites for this course** (if any): | | | | | |
| **NIL** | | | | | |
| **7. Course Main Objective(s):** | | | | | |
| **To enable students to understand, define, different types of human factors for optimizing the ergonomic condition for better employee working conditions.** | | | | | |

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

| No | Mode of Instruction | Contact Hours | Percentage |
|---|---|---|---|
| 1 | Traditional classroom | 40 | 100% |
| 2 | E-learning | | |
| 3 | Hybrid<br>● Traditional classroom<br>● E-learning | 40 | 100% |
| 4 | Distance learning | 0 | 0 |

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

| No | Activity | Contact Hours |
|---|---|---|
| 1. | **Lectures** | 40 |
| 2. | **0** | 0 |
| 3. | **Field** | 0 |
| 4. | **Tutorial** | 0 |
| 5. | **Others (specify)** | 0 |
| **Total** | | 40 |

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

| Code | Course Learning Outcomes | Code of PLOs aligned with the program | Teaching Strategies | Assessment Methods |
|---|---|---|---|---|
| **1.0** | **Knowledge and understanding** | | | |
| 1.1 | Define human factor and ergonomics principles affecting Human performance | K1 | Lectures<br>Discussion<br>Tutorial sheets | Quiz<br>Assignment<br>Mid Exam<br>Final Exam |
| 1.2 | Recognize and build comprehensive study of ergonomics in workplace to communicate effects | K3 | Lectures<br>Discussion<br>Tutorial sheets | Quiz<br>Assignment<br>Mid Exam<br>Final Exam |
| 1.3 | List the basic requirement of workplace and apply ergonomic principles with reference to the workplace. | K4 | Lectures<br>Discussion<br>Tutorial sheets | Quiz<br>Assignment<br>Mid Exam<br>Final Exam |
| **2.0** | **Skills** | | | |

| Code | Course Learning Outcomes | Code of PLOs aligned with the program | Teaching Strategies | Assessment Methods |
|---|---|---|---|---|
| 2.1 | Design and evaluation of ergonomic systems in Industrial environment in relation to the study of Biomechanics and Manual Strength Design | S4 | Lectures<br>Discussion<br>Tutorial sheets | Quiz<br>Assignment<br>Mid Exam<br>Final Exam |
| **3** | **Values, autonomy, and responsibility** | | | |
| 3.1 | Develop experiments with anthropometric data for individuals and groups according to the requirement of NOISH equations. | V3 | Lectures<br>Discussion<br>Tutorial sheets | Quiz<br>Assignment<br>Mid Exam<br>Final Exam |

## C. Course Content

| No | List of Topics | Contact Hours |
|---|---|---|
| 1. | Study of Human body, Mind, Senses | 4 |
| 2. | Study of effective and non-effective ergonomic models. | 4 |
| 3. | Study of body movements, muscles, body parts | 6 |
| 4. | Study of ergonomic principles with reference to the workplace. | 6 |
| 5. | Comprehensive study of ergonomics in workplace | 6 |
| 6 | Study of anthropometry | 4 |
| 7. | Design and evaluation of ergonomic systems in Industrial environment (Noise/NIOSH Equations) | 6 |
| 8 | Study of Biomechanics and Psychophysics of Manual Strength Design | 4 |
| **Total** | | **40** |

## D. Students Assessment Activities

| No | Assessment Activities * | Assessment timing (in week no) | Percentage of Total Assessment Score |
|---|---|---|---|
| 1. | E-learning based activities (On-line Quizzes, Assignments) | Every Week | 25% |
| 2. | Mid Exam- I | 6TH week | 15% |
| 3. | Mid Exam- II | 11th week | 15% |

| No | Assessment Activities * | Assessment timing (in week no) | Percentage of Total Assessment Score |
|---|---|---|---|
| | | | |
| 4. | Group Discussions / Attendance / Participation | All week | 05% |
| 5. | Final Exam | 18th week | 40% |

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

## E. Learning Resources and Facilities

### 1. References and Learning Resources

| | |
|---|---|
| **Essential References** | Ergonomics: How to design for ease and efficiency, Kroemer, K., Kroemer, H., and Kroemer-Elbert, K., 2018, 3nd Edition Upper, ISBN 9780128132968 |
| **Supportive References** | Stephan Konz Steven Johnson Cahyono St Cahyono St, 2022. **Work Design Occupational Ergonomics, Holcomb Hathaway Publishers ISBN: ISBN 978-1-890871-79-6** |
| **Electronic Materials** | • Human factor and ergonomics in Manufacturing & Service Industries, Willey Publishers |
| **Other Learning Materials** | https://www.youtube.com/ |

### 2. Required Facilities and equipment

| Items | Resources |
|---|---|
| **facilities** (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.) | • Lecture room<br>• Backboard facility for sharing lecture notes,<br>• Submission of assignments and attempting Quizzes.<br>• Details of recommended group profiles in the teacher manual |
| **Technology equipment** (projector, smart board, software) | • Every student requires access to a personal computer and the Internet.<br>• On-site University access is provided through the University Central Library. |
| **Other equipment** (depending on the nature of the specialty) | • Present Planned Resources takes care of the subject's needs. |

## F. Assessment of Course Quality

| Assessment Areas/Issues | Assessor | Assessment Methods |
|---|---|---|
| Effectiveness of teaching | **Students** | **Course Evaluation Survey (CES** |
| Effectiveness of Students assessment | **Students** | **Blackboard feedback** |
| Quality of learning resources | **Students** | **Course Evaluation Survey (CES)** |
| The extent to which CLOs have been achieved | **Course Evaluation Committee (CEC)** | **In-Situ Evaluation** |
| Other | | |

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

**Assessment Methods** (Direct, Indirect)

## G. Specification Approval

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|---|---|
| **COUNCIL /COMMITTEE** | REVIEWED BY CURRICULUM COMMITTEE<br>APROVED BY QUALITY COMMITTEE |
| **REFERENCE NO.** | **9-6-47** |
| **DATE** | **25/06/1447** |