

Advanced Occupational Ergonomics

Course Syllabus

INSTRUCTOR

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COURSE DETAILS

NUMBER	GSSL 2030
CREDIT	6.5 CEUs · 67 contact hours
FORMAT	Online · Canvas LMS
DURATION	6 months
SESSIONS	Jan 1 – Jun 15 / Jul 1 – Dec 15

No prerequisites required. No textbook required. Recommended readings provided in Canvas.

COURSE DESCRIPTION

The online Advanced Occupational Ergonomics course focuses on the human–work interaction. The curriculum provides beginning-through-advanced knowledge, skills, and competencies in occupational ergonomics. This comprehensive course is appropriate for individuals with no prior ergonomics experience as well as those seeking advanced training. Graduates will be able to apply ergonomic concepts and principles to identify, develop, implement, and evaluate design solutions to ergonomic challenges in the work environment.

CONTINUING EDUCATION CREDIT

This course awards 6.5 CEUs. A Certificate of Completion in Advanced Occupational Ergonomics is awarded to students achieving an overall score of at least 80%. University regular course credit is not awarded for this course; however, university students often register through their institution to obtain independent study credit. CEUs are accepted by many professional organizations (Nursing, Physical Therapy, Occupational Therapy, Athletic Training, Human Resources, etc.) and employer programs.

CLASS MEETINGS & LOCATION

This course is an off-campus, adult education class delivered through the Canvas Learning Management System at Colorado State University. Students are *not* expected to visit campus. All communications and interactions occur via email with the instructor and teaching assistant. Video presentations, quizzes, and projects are delivered and assessed through Canvas, and every enrolled student receives free access to the Canvas system with onboarding instructions. Optional Zoom meetings will be scheduled once a month for course assistance and guest presentations.

COURSE DURATION & PACE

The course must be completed within the scheduled 6-month period (January 1 – June 15 or July 1 – December 15). All video modules, quizzes, and application projects must be completed within the allotted time; course access closes at the end of the period. The recommended pace is two modules per week, though students may progress faster or slower to accommodate their schedules.

COURSE MATERIALS

All course materials — video presentations, PowerPoint presentation notes (PDF), quizzes, application projects, and selected readings — are provided through Canvas. No textbook is required. The course comprises 28 video modules covering broad topics in Occupational Ergonomics; each video module is approximately 30–40 minutes long and includes:

- PowerPoint presentation notes
- Suggested readings for additional depth (1–2 hours per module)
- A 15-item quiz at the end of each module (30 minutes)
- There are six applied projects, and you must finish at least four to pass the course. Most students complete all six for extra credit. On average, the projects require about two hours.

CERTIFICATE OF COMPLETION

Upon successful completion of this course, students receive a signed Certificate of Completion in Advanced Occupational Ergonomics from Colorado State University. Successful completion requires a score of $\geq 80\%$ on the combined total of quizzes and short application projects.

This course addresses components of the core competencies outlined by the Board of Certification in Professional Ergonomics (BCPE) but does not directly lead to BCPE certification. It is designed to provide ergonomics content in five broad educational categories as specified by the BCPE.

BCPE www.bcpe.org · Education Requirements: [BCPE Education Requirements \(PDF\)](#)

COURSE OBJECTIVES

The course content is organized around four general goals of occupational ergonomics: (1) improved work efficiency and productivity, (2) enhanced quality of products or services, (3) reduced injuries and illnesses, and (4) enhanced quality of work life.

Upon completion, participants will be able to:

- Outline the historical contributions related to modern work processes.
- Prepare for an on-site ergonomics risk assessment of specific job tasks.
- Discuss how workstation organization and layout, equipment, and work processes influence the risk of musculoskeletal disorders and how to prevent them through ergonomic design.

- Analyze workplace design using principles of anthropometry, occupational biomechanics, work physiology, and epidemiology.
- Apply anthropometry tables for evaluation and design criteria.
- Identify engineering solutions to improve production efficiency and reduce musculoskeletal disorder risk.
- Analyze ergonomic design principles for manual materials handling tasks.
- Apply the NIOSH Lifting Equation for manual material handling tasks and develop interventions based on its parameters.
- Identify the changing needs of the existing and future workforce.
- Apply ergonomic risk assessment tools including REBA, RULA, Rodgers Muscle Fatigue Analysis, Hand Activity Level (HAL), and the Revised Strain Index.
- Identify associations or causation between occupational and non-occupational risk factors and musculoskeletal disorders.
- Apply ergonomic principles to office workstations and design layouts to reduce negative health effects of prolonged sitting.
- Apply the OSHA computer workstation evaluation in an office environment.
- Discuss how telepressure, shift work, and sleep issues affect job performance as they relate to absenteeism and presenteeism.
- Discuss how ergonomic design is influenced by generational differences.
- Define work stress and solutions to reduce related adverse health outcomes.
- Diagram the essential elements of an ergonomic process.
- Conduct the 5-step ergonomics problem-solving process to develop successful workplace solutions.
- Conduct cost-benefit analyses and return on investment (ROI) calculations to justify proposed ergonomic solutions.
- Understand the certification process for professional ergonomists as outlined by the BCPE.
- Utilize artificial intelligence in the risk assessment of ergonomic issues.
- Demonstrate competency through the successful completion of three applied work projects and 390 exam (quiz) questions.

MODULE LEARNING OBJECTIVES

Each video module has a set of specific learning objectives for the topics covered.

PERFORMANCE EVALUATION

Each video presentation is followed by a required quiz. Additionally, six application projects are embedded within selected modules.

ASSESSMENT COMPONENT	POINTS
28 Quizzes (15 points each)	420
4 Required Application Projects (30 points each)	120
Course Exit Survey	15
Total Points (excluding extra credit)	555

Extra Credit Up to 2 additional application projects may be completed. Each project completed successfully beyond the required three earns 15 extra credit points.

Quiz Policy Students have 30 minutes per quiz and may repeat each quiz once if not satisfied with the initial score.

GRADING SCALE

GRADE	PERCENTAGE	NOTES
A	> 90%	
B	> 80%	
Pass	> 80%	Required for Certificate of Completion

ACCOMMODATIONS

Students with special needs or limitations will be accommodated by the University to the best of our ability given the resources available. Please notify the instructor of any special needs.

COURSE OUTLINE

The curriculum is organized into five thematic units spanning 28 video modules.

MODULE	TITLE
UNIT A · INTRODUCTION TO ERGONOMICS	
1	Introduction to the Course and Instructor
2	Introduction to Occupational Ergonomics
UNIT B · PRINCIPLES OF OCCUPATIONAL ERGONOMICS	
3	History and Contributors to Current Work Practices
4	Basics of Anthropometrics
5 ★	Application of Anthropometrics
6 ★	Work Physiology
7	Occupational Biomechanics
8	Epidemiology and Research Design in Ergonomics
9	Ergonomic Exposure Assessment Principles
UNIT C · MUSCULOSKELETAL DISORDERS AND RISK ASSESSMENT	
10	Upper Extremity Anatomy and Musculoskeletal Disorders
11	Upper Extremity Disorders and Associated Risk Factors
12 ★	Upper Extremity Risk Assessment Tools
13	Back Anatomy and Structure
14	Back Disorders and Risk Factors
15 ★	Low Back Risk Assessment: The NIOSH Lifting Equation
UNIT D · PHYSICAL HUMAN – WORK INTERFACE	
16 ★	Ergonomic Design of Computer Workstations
17	Design and Layout for Productive and Healthy Office Work
18	Organization and Layout of Manufacturing Workstations
19	Whole Body Risk Assessment Tools
20	Direct Ergonomic Exposure Assessment Tools
UNIT E · ORGANIZATIONAL AND SYSTEMS APPROACH	

MODULE	TITLE
21	Organizational Aspects of the Human–Work Interface to Enhance Safety: Introduction to Safety
22	Designing Work with Systematic Procedures to Enhance Safety
23	Occupational Health Psychology and Perspectives on Work Stress
24	Absenteeism, Presenteeism, Sleep and the Workplace
25	Safety and Ergonomics Culture in the Workplace
26 ★	Ergonomic Programs and Processes
27	Artificial Intelligence–Powered Ergonomic Risk Assessment
28 ★	Artificial Intelligence–Assisted Ergonomics Documentation

★ *Module includes an application project.*