SYLLABUS FOR THE BATCH FROM YEAR 2025 TO 2026

FOR

Certificate course in Human Factors and Ergonomics

(Credit Based Evaluation and Grading System)

Semester: I

EXAMINATIONS: 2025-2026

- **Certificate Course in Human Factors and Ergonomics (6 Months duration)**

Program Outcomes:

1. Demonstrate a deep understanding of core concepts, theories, and methodologies in Human Factors and Ergonomics (HFE), including human capabilities and limitations.
2. Apply critical thinking and problem-solving skills to analyze human-system interactions andrecommend design improvements for enhancing performance, safety, and the user experience
3. Exhibit an understanding of global trends and practices in HFE, along with the ability to adaptand collaborate in diverse cultural settings.

MYAS – GNDU Department of Sports Sciences and Medicine

In collaboration with

Directorate of Open & Distance Learning and Online Studies

GURU NANAK DEV UNIVERSITY AMRITSAR

Certificate course in Human Factors and Ergonomics (SEMESTER SYSTEM) Offered by Department of MYAS – GNDU Department of Sports Sciences and Medicine in Collaboration with Directorate of Open & Distance Learning and Online Studies, Guru Nanak Dev University Amritsar

Eligibility:
- +2or equivalent examination.
- Any student pursuing Bachelor Degree, Master Degree, M.Phil., Ph.D. from GNDU campus, affiliated or constituted colleges

SEMESTER-I

Paper Code	Subject	Marks			Credits
		Internal Assessment	End Term	Total	
ODHFE101T	Introduction to Human Factors	30	70	100	4
ODHFE101T	Perception and Cognition	30	70	100	4
ODHFE101T	Physical Human Factors	30	70	100	4
ODHFE101T	Introduction to Modeling and Simulation in Human Factors	30	70	100	4
TotalMarks&Credits		**120**	**280**	**400**	**16**

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Subject Name: Introduction to Human Factors
Subject Code: ODHFE101T
(Semester–I)

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Time: 03Hours   **Max.Marks:100Marks**

Internal Assessment: 30 Marks

End Term: 70Marks

Instructions for the Paper-Setter/examiner:

1. Question paper shall consist of **Four sections**.
2. Paper setter shall set **Eight questions** in all by selecting **Two questions** of equal marks from each section. However, a question may have sub-parts (not exceeding four sub-parts) and appropriate allocation of marks should be done for each sub-part.
3. Candidates shall attempt **Five questions** in all, by at least selecting **One question** from each section and the **5th question** may be attempted from any of the **Four sections**.
4. The question paper should be strictly according to the instructions mentioned above. In no case a question should be asked outside the syllabus.

Section – A

Foundations of Human Factors
Definition, scope, and significance of human factors in various domains.
Historical evolution and key contributors to the field of human factors.

Section – B

Human-Centered Design Principles
Introduction to user-centered design principles and their role in creating effective products and systems

Section – C

Organizational focus Including work patterns, the culture of the workplace, resources, communications
Managing human failures Influence of biological, psychological and organizational factors

Section - D

Measuring and Evaluating workload: Performance, indirect, subjective and physiological measures.
Strategies for designing intuitive and effective user interfaces
Emerging Trends: Artificial Intelligence (AI) and Workload
Virtual and Augmented Reality (VR/AR)

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Subject Name: Perception and Cognition
Subject Code: ODHFE102T
(Semester–I)

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Time:03Hours   Max.Marks:100Marks
                                           InternalAssessment:30 Marks
                                                   EndTerm:70Marks

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Section – A

Human Perception and Sensation
Understanding human sensory systems and their influence on perception

Section – B

Exploring the role of perception in design, usability, and user experience.
Cognitive Processes and Information Processing

Section – C

Application of cognitive psychology principles in designing intuitive interfaces

Section - D

Executive and control processes
Macro-cognition, Embodied cognition, Distributed cognition, situated cognition, Decision making in uncertainty

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Subject Name: Physical Human Factors
Subject Code: ODHFE103T
(Semester–I)

Time:03Hours

Max.Marks:100Marks
InternalAssessment:30 Marks
EndTerm:70Marks

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3. Candidates shall attempt **Five questions** in all, by at least selecting **One question** from each section and the **5th question** may be attempted from any of the **Four sections**.
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Section – A

Fundamental principles of biomechanics
Musculoskeletal anatomy and structure
Forces, moments, and load distribution on the human body

Section – B

Anthropometric measurements and data collection methods
Design considerations based on human anthropometry
Workspace design and layout optimization

Section – C

Identification and assessment of ergonomic risk factors
Workplace injuries (e.g., slips, trips, falls)
Ergonomic guidelines for preventing workplace injuries
Designing tools and equipment for safety and ease of use

Section - D

Techniques for biomechanical analysis
Motion analysis and its applications
Biomechanical modeling and simulations

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Subject Name: Introduction to Modeling and Simulation in Human Factors
Subject Code: ODHFE104T
(Semester–I)

Time:03Hours

Max.Marks:100Marks
InternalAssessment:30 Marks
EndTerm:70Marks

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Section – A
Overview of modeling and simulation in human factors research and applications
Historical context and evolution of digital human modeling and simulation
Benefits and limitations of using simulation techniques

Section – B
Principles of digital human modeling and its role in ergonomic design
Introduction to DHM software tools and platforms

Section – C
Using simulation to assess human performance and task execution
Evaluating usability and efficiency through performance simulations

Section - D
Analyzing safety risks and hazards using simulation techniques
Incorporating human behavior and interaction into safety simulations