

Ergonomics for beginners: Industrial design perspective - Video course

COURSE SYLLABUS

Overview of ergonomics and design relevances; Man- the prime system component; Man-machine-environment interaction system and user-friendly design practice; Human compatibility, comfort and adaptability; Fundamentals of ergonomics: Physical (anthropometrics, human body- structure and function, posture, movement and biomechanics), Physiological (work physiology) and Psychological aspects (behavior, cognitive aspects and mental workload); Information processing, human error and risk perception; Visual performance and visual displays; environmental factors influencing human performance; Occupational stress; safety and health issues; Ergonomics criteria/check while designing; Design process involving ergonomics check and ergonomic design evaluation and Participatory ergonomics aspects.

Total Number of Lectures: 40 distributed in 10 modules

Module No	Module Topic	No. of Classes
Module 1	Introducing Ergonomics, Welcome and content details	2
Module 2	Discipline approach: Ergonomics/ Human factors	5
Module 3	Human physical dimension concern	7
Module 4	Posture and movement	8
Module 5	Behaviour and perception	5
Module 6	Visual Issues	2
Module 7	Environments Factors	1
Module 8	Ergonomic design process	4
Module 9	Performance support and design intervention	5
Module 10	Design Ergonomics in India: scope for exploration	1
	Total	40

Course material



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Engineering Design

Coordinators:

Prof. Debkumar Chakrabarti
Department of Engineering Design IIT Guwahati

Sl. No.	Topic	Lecture Hour
Module I: Introducing Ergonomics, Welcome and content details		02
1	Welcome and content details: Syllabus	1
2	Design today- Human aid to lifestyle	1
Module 2: Discipline approach: Ergonomics/ Human factors		05
3	Journey, Fitting task to man their contractual structure	1
4	Domain, Philosophy and Objective	1
5	Mutual task comfort: two way dialogue, communication model	1
6	Ergonomics/ human Factors fundamentals	1
7	Physiology (work physiology) and stress	1
Module 3: Human physical dimension concern		07
8	Human body- structure and function, anthropometrics	1
9	Anthropometry: body growth and somatotypes	1
10	Static and dynamic anthropometry, Stand Posture- erect	1
11	Anthropometry landmark: Sitting postures	1
12	Anthropometry: squatting and cross-legged postures	1
13	Anthropometric measuring techniques	1
14	Statistical treatment of data and percentile calculations	1
Module 4: Posture and movement		08
15	Human body- structure and function	1
16	Posture and job relation	1
17	Posture and body supportive devices	1
18	Chair characteristics	1
19	Vertical work surface	1

20	Horizontal work surface	1
21	Movement	1
22	Work Counter	3
Module 5: Behaviour and perception		05
23	Communication and cognitive issues	1
24	Psycho-social behaviour aspects, behaviour and stereotype	1
25	Information processing and perception	1
26	Cognitive aspects and mental workload	1
27	Human error and risk perception	1
Module 6: Visual Issues		02
28	Visual performance	1
29	Visual displays	1
Module 7: Environments Factors		01
30	Environmental factors influencing human performance	1
Module 8: Ergonomic design process		04
31	Ergonomics design methodology	1
32	Ergonomics criteria/check while designing	1
33	Design process involving ergonomics check	1
34	Some checklists for task easiness	1
Module 9: Performance support and design intervention		05
35	Occupational safety and stress at workplace in view to reduce the potential fatigue, errors, discomforts and unsafe acts	1
36	Workstation design	1
37	Furniture support	1
38	Vertical arm reach and design application possibility	1

39	Humanising design: Design and human compatibility, comfort and adaptability aspects	1
Module 10: Design Ergonomics in India: scope for exploration		01
40	Concluding session: Design Ergonomics in India: scope for exploration	1

References:

1. Bridger, RS: Introduction to Ergonomics, 2nd Edition, Taylor & Francis, 2003.
2. Dul, J. and Weerdmeester, B. Ergonomics for beginners, a quick reference guide, Taylor & Francis, 1993.
3. Green, W.S. and Jordan, P .W, Human Factors in Product Design, Taylor & Francis, 1999.
4. D. Chakrabarti, Indian Anthropometric Dimensions for ergonomic design practice, National Institute of Design, Ahmedabad, 1997
5. G. Salvendy (edit), Handbook of Human Factors and ergonomics, John Wiley & Sons, Inc., 1998
6. Singh, S (Edt), Ergonomics Interventions for Health and Productivity, Himanshu Publications, Udaipur, New Delhi, 2007