GUJARAT TECHNOLOGICAL UNIVERSITY

BRANCH NAME: INDUSTRIAL ENGINEERING

SUBJECT NAME: INDUSTRIAL ERGONOMICS
SUBJECT CODE: 2181504
B.E. 8th SEMESTER

Type of course: Department Elective

Prerequisite: No specific prerequisites. Students should have basic knowledge of Product design & development and work system design.

Rationale: This course provides an overview on principles of ergonomics and human factors, their applications to the design and management of industrial systems, Engineering anthropometry, Human performance, human-technology interaction, work place and work station design. The emphasis is on how methods are used to study, improve and optimize designing a product or industrial system.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks						Total Marks
L	T	P	C	Theory Marks			Practical Marks			
				ESE (E)	PA (M)		ESE (V)		PA (I)	
					PA	ALA	ESE	OEP		
4	0	2	6	70	20	10	20	10	20	150

Content:

Sr. No.	Content	Total Hrs	% Weight age
1	Human Physical Characteristics, Ergonomics and Human Factors Engineering	10	15
2	Physiology of Work, Cognitive Psychology and Sensory Processes, Biomechanics and Engineering.	12	20
3	Engineering Anthropometry, Human Machine System, Machine and Tool Design	12	20
4	Work Place and Work Station Design, Work Design, Fundamentals of Physical Working Environment, Information Technology.	12	20
5	Office Systems and Ergonomics, Ergonomics of Technology Management.	9	13
6	Consumer Ergonomics, Ergonomics Quality and Safety, Quality of Life	9	12

Suggested Specification table with Marks (Theory):

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
30	35	15	10	5	5

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create and above Levels (Revised Bloom's Taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Reference Books:

1. Human Factors in Engineering and Design By Sanders & Mccormick (McGrowHill Publication)
2. Occupational Ergonomics – Principles and Applications By Tayyari & Smith (Chapman & Hall Publication)
3. The Power of Ergonomics as a Competitive Strategy By Gross & Right (Productivity Press)

Course Outcome:

After learning the course the students should be able to:

- Specify and design ergonomically appropriate industrial workstations for the industrial and office work environment.
- Identify information-centered human factors relating to visual, illumination, controls, displays and symbols.
- Compare, contrast and assess human body-centered ergonomic designs for posture, material handling, repetitive motion factors, heat stress, noise and vibration.
- Define the ergonomic factors intrinsic in evaluating accidents, human errors and safety related incidents.
- Illustrate and assess the ergonomic factors in computer work station design.
- Discuss and identify key components of cost-benefit analysis in human factors and ergonomic design.
- Summarize key components in conducting a human factors or ergonomics related investigation.

List of Experiments:

The T.W. will be based on the above syllabus.

Major Equipment: None

List of Open Source Software/learning website: www. nptel.ac.in

ACTIVE LEARNING ASSIGNMENTS: Preparation of power-point slides, which include videos, animations, pictures, graphics for better understanding theory and practical work – The faculty will allocate chapters/ parts of chapters to groups of students so that the entire syllabus to be covered. The power-point slides should be put up on the web-site of the College/ Institute, along with the names of the students of the group, the name of the faculty, Department and College on the first slide. The best three works should submit to GTU.