



**Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore**  
**Shri Vaishnav Institute of Technology and Science**  
**Choice Based Credit System (CBCS) Scheme in light of NEP-2020**  
**Generic Elective (Odd Semester)**  
**(2021-2025)**

COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME									
			THEORY			PRACTICAL			L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*					
MTMEGE102	GE	ERGONOMICS	60	20	20	0	0	3	0	0	3	

**Legends:** L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;  
\*Teacher Assessment shall be based following components: Quiz/Assignment/Project/Participation in Class, given that no component shall exceed more than 10 marks.

**Course Objectives:-**

The primary objective of the course is to describe and develop knowledge of (A) Musculo-skeletal systems and Anthropometrics (B) Occupational Ergonomics and Risk Assessment, (C) Physical Human-Work Interface, (D) Organizational and Systems Approach.

**Course Outcomes:-**

After completion of this course the students will be able to describe the followings:

1. Students will be able to understand & describe concepts of ergonomics.
2. Students will be able to describe work physiology and musculoskeletal disorders.
3. Students will be able to describe the associated risk factors with ergonomic design.
4. Students will be able to understand the design and layout for productive and healthy office work.

**Syllabus**

**Unit-I**

(9Hrs)

**Introduction to Ergonomics:** Introduction to Ergonomics; Musculo-skeletal systems and human locomotion; Neural control of human movement; Occupational Ergonomics; Basics of Anthropometrics; Basic anthropometry, measurements, body fat, body surface area, body segments, use of anthropometric data in design; Application of Anthropometrics.

**Unit-II**

(9Hrs)

**Occupational Ergonomics and Musculoskeletal Disorders:** Work Physiology, Occupational Biomechanics, Epidemiology and Research Design in Ergonomics; Ergonomic Exposure Assessment Principles, Upper Extremity Anatomy and Musculoskeletal Disorders, Upper Extremity Disorders.

**Unit-III**

(8Hrs)

**Risk Assessment:** Upper Extremity Disorders and Associated Risk Factors; Upper Extremity Risk Assessment Tools; Back Anatomy and Structure, Back Disorders and Risk Factors; Low Back Risk Assessment: The NIOSH Lifting Equation.

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**Unit-IV:**

**(9Hrs)**

**Physical Human-Work Interface:** Ergonomic Design of Computer Workstations; Design and Layout for Productive and Healthy Office Work, Organization and Layout of Manufacturing Workstations; Whole Body Risk Assessment Tools; Direct Ergonomic Exposure Assessment Tools.

**Unit-V**

**(8Hrs)**

**Organizational and Systems Approach:** Organizational Aspects of the Human-Work Interface to Enhance Safety: Introduction to Safety; Designing Work with Systematic Procedures to Enhance Safety; Occupational Health Psychology and Perspectives on Work Stress; Absenteeism, Presenteeism, Sleep and the Workplace; Safety and Ergonomics Culture in the Workplace; Ergonomic Programs and Processes.

**Reference Books:**

1. Bridger, RS, "Introduction to Ergonomics", 2nd Edition, Taylor & Francis, 2003.
2. Kroemer, K.H.E., "Fitting the Human: Introduction to Ergonomics", CRC Press, 2019.
3. Freivalds, A., Neibel's, "Methods, Standards and Work Design", McGraw Hil., 2019.
4. Pheasant, S. & Haslegrave, C., "Body space: Anthropometry, Ergonomics, and the Design of Work", CRC Press, 2018.
5. D. Chakrabarti, "Indian Anthropometric Dimensions for ergonomic design practice", National Institute of Design, Ahmedabad, 1997.
6. G. Salvendy (edit), "Handbook of Human Factors and ergonomics", John Wiley & Sons, Inc., 1998.
7. Singh, S (Edt), "Ergonomics Interventions for Health and Productivity", Himanshu Publications, Udaipur, New Delhi, 2019.

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