



**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 (Even 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*				
MTMEGE201	GE	SUSTAINABLE MANUFACTURING CONCEPT	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 Educational Objectives (CEOs)

Sustainability aims to conserve energy and natural resources, and to ensure that they have minimal impact on the environment and society. It targets at fulfilling the needs of the present without compromising the ability of future generations to meet their own needs.

1. This course provides an overview of the Sustainability through Green Manufacturing Systems; various methodologies and its application in improving the eco-efficiency are focused.
2. Students will also learn about the commonly used Sustainable manufacturing tools such as Environmentally Conscious Quality Function Deployment (ECQFD) and Life Cycle Assessment (LCA).

### Course Outcomes (COs)

course outcomes are:

1. Students will be able to have a basic knowledge about sustainable manufacturing
2. Students will be able to use the tools required for implementing sustainable manufacturing
3. Students will be able to do calculations required for implementing sustainable manufacturing
4. Students will know about practical applications of sustainable manufacturing

### Syllabus

#### Unit-I

(8Hrs)

Concept of sustainability, manufacturing, operations, processes, practices, Resources in manufacturing, Evolution of Sustainable Manufacturing, Definitions of sustainable Manufacturing.

#### Unit-II

(8Hrs)

Environmentally Conscious Quality Function Deployment (ECQFD), ECQFD Phase-I, ECQFD Phase-II, ECQFD Phase-III, ECQFD Phase-IV, Extended Producer Responsibility (EPR) policy.

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Shri Vaishnav Vidyapeeth  
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**Unit-III** (9Hrs)  
Fundamentals of Life Cycle Assessment (LCA), LCA Phase-I, LCA Phase-II, LCA Phase-III, LCA Phase-IV, Life Cycle Cost Analysis.

**Unit-IV** (9Hrs)  
Frameworks for measuring sustainability- Indicators of sustainability – Environmental, Economic, Societal and Business indicators - Concept Models and Various Approaches.

**Unit-V** (8Hrs)  
Green Supply chain: Carbon footprints in transportation, Whole value chain, and lifecycle of products/services, from the development, to the end of life stages.

**References Books:**

1. G. Atkinson, S. Dietz, E. Neumayer, "Handbook of Sustainable Manufacturing". Edward Elgar Publishing Limited, 2007.
2. D. Rodick, "Industrial Development for the 21st Century: Sustainable Development Perspectives", UN New York, 2007.
3. Rogers, P.P., Jalal, K.F. and Boyd, J.A., "An Introduction to Sustainable Development", Earth scan, London, 2007.
4. P. Lawn, "Sustainable Development Indicators in Ecological Economics", Edward Elgar Publishing Limited.
5. S. Asefa, "The Economics of Sustainable Development", W.E. Upjohn Institute for Employment Research, 2005.

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