Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore
Shri Vaishnav Institute of Technology and Science
Choice Based Credit System (CBCS) in the Light of NEP-2020

COURSE CODE	CATE-GORY	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*				
GUEE201	GE	**Basics of Robot Design**	60	20	20	0	0	4	0	0	4

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):
The goal of the Robotics course is to familiarize the students with the concepts and techniques used in design of a small robotic system.

Course Outcomes (COs):
1. To develop the student's knowledge in various robot structures and their workspace.
2. To develop student's skills in performing spatial transformations associated with rigid body motions.
3. To develop student's skills in perform kinematics analysis of robot systems.
4. To provide the student with a brief knowledge or sensors and actuators used in robotics
5. To provide exposure to the concepts of some typical types of robots used in robotic gaming.

Syllabus

UNIT I   **9 Hrs.**
Brief History, Types of robots, Overview of robot subsystems, resolution, repeatability and accuracy, Degrees of freedom of robots, Robot configurations and concept of workspace**,** Mechanisms and transmission.

UNIT II   **8 Hrs.**
End effectors and Different types of grippers, vacuum, and other methods of gripping. Pneumatic, hydraulic and electrical actuators, applications of robots, specifications of different industrial robots.

UNIT III   **8 Hrs.**
Basics of Embedded C programming, C fundamentals, Control statements, loops and Conditional Statements, Functions, Programming.

UNIT IV   **8 Hrs.**
Sensors and controllers: Internal and external sensors, position, velocity and acceleration sensors, proximity sensors, force sensors, laser range finder.

UNIT V   **8 Hrs.**
Case Study: Developing and building a robot. Line follower, Maze Solver, Grid Solver etc.

Chairperson	**Chairperson**	**Controller of Examination**	**Joint Registrar**
Board of Studies	**Faculty of Studies**	**Shri Vaishnav Vidyapeeth**	**Shri Vaishnav Vidyapeeth**
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Text Books:
1. Nagrath and Mittal, "Robotics and Control", Tata McGraw-Hill, 2003.
2. Michael Barr, "Programming Embedded Systems in C and C++", O'Reilly Media, Inc.1999

References:
1. Spong and Vidhyasagar, "Robot Dynamics and Control", John Wiley and sons, 2008.
2. Harry Asada & Slottine "Robot Analysis& Control" , Wiley Publications, 2014

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