Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore
Shri Vaishnav Institute of Technology and Science
Department of Electrical and Electronics Engineering
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*				
	GE	**Introduction to Drone Technology**	60	20	20	30	20	2	0	2	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):
The goal of the Drone Technology course is to familiarize the students with the concepts and techniques used in design of a small drones and its applications.

Course Outcomes (COs):
The students will be able to
1. Learn about the various types of Drones and its applications.
2. Learn about the various components of drone design.
3. Design basic types of drone systems.

Syllabus

UNIT I
Introduction to Drones   **5 Hrs.**
Definition and history of drones, Types of drones and their applications, Drone components and terminology, Regulations and Guidelines for drone usage.

UNIT II
Drone Design and Assembly   **6 Hrs.**
Design considerations for drone airframe and propulsion systems, Selecting and assembling drone components such as motors, batteries, flight controllers, and cameras, Basic wiring and soldering techniques.

UNIT III
Drone Motors and ESC   **7 Hrs.**
Working, Types: Brush and Brushless Motors, motor sizing and identification, mounting patterns and thread size, Thrust to Weight ratio, KV ratings, advanced motor selection, Electronic Speed Controller (ESC).

UNIT IV
Flight Mechanics and Dynamics   **7 Hrs.**
Basic principles of flight mechanics, flight controller board, Selection of drone controller with example, Factors affecting drone flight performance and efficiency.

Chairperson   **Chairperson**   **Controller of Examination**   **Joint Registrar**

Board of Studies   **Faculty of Studies**   **Shri Vaishnav Vidyapeeth**   **Shri Vaishnav Vidyapeeth**
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UNIT V
Applications of Drone   **5 Hrs.**
Overview of commercial and industrial drone applications, Case studies and examples of successful drone deployments, GPS based navigation system, Drone Camera Systems, Agro application, Drone Delivery, Future trends and developments in the drone industry.

Text Books:
1. M. LaFay, Building Drones for Dummies, John Wiley & Sons, Inc., n.d.
2. E. Tooley, Practical Drones: Building, Programming, and Applications, Apress, 2021.
3. D. Levy, Drone Programming: A Guide to Code Your Own Drones, Packt Publishing, n.d.
4. S. K. Kopparthy, Drone Technology: Theory and Practice, Springer, 2020.
5. P. Horowitz and W. Hill, The Art of Electronics, Cambridge University Press, 2015.
6. K. Sundar and R. V. Rajakumar, Multicopters: Principles and Applications, Springer, 2021.

References:
1. D. Saxby, Drone Aerial Photography and Video: Techniques and Stories from the Field, Cengage Learning, 2018.
2. D. McLeod, Getting Started with Drone: How to Build, Fly, and Program Your Own Drone, Apress, 2019.
3. M. A. Banks, Building and Flying Electric Model Aircraft, O'Reilly Media, Inc., 2014.
4. G. C. Camara Leal, Flying Robots: An Introduction to Autonomous Aerospace Systems, Springer, 2017.

List of Experiments:
1. Study of Drone Frame
2. Study of Motor
3. Study of ESC
4. Study of Flight Controller
5. Learn Soldering Techniques
6. Assembling Drone
7. Drone Flight Control

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