Course Descriptor
ECEN 533 Power Electronics

ACADEMIC YEAR	2020-2021		
Course Code & Title	ECEN 533 Power Electronics		
Credit hours	3	**Level of study**	Undergraduate
College / Centre	COE		
Co-requisites		**Pre-requisites**	ECEN331 Electronics I

1. COURSE OUTLINE

Fundamentals of power electronics and applications. Switch-mode power conversion, power supplies, inverters, motor drives, and power semiconductor devices. System analysis, design, and modeling.]

2. AIMS

This course prepares students for engineering practice through discussion of design and performance of power electronic circuits and their applications. This course includes engineering topics and engineering design.]

3. LEARNING OUTCOMES, TEACHING, LEARNING and ASSESSMENT METHODS

Learning Outcomes *(Definitive)* Upon successful completion of this course, students will be able to**:**	**Teaching and Learning methods *(Indicative)***	**Assessment *(Indicative)***
1. Analyze and design rectifiers and inverters.	Lecturer, Presentation, seminar	Assignments, Written Examination, quizzes
2. Analyze and design DC-DC switch-mode converters	Lecturer, Presentation, seminar	Assignments, Written Examination, quizzes
3. Analyze and design AC-DC switch-mode converters	Lecturer, Presentation, seminar	Assignments, Written Examination, quizzes
4. Analyze and design switching DC power supplies	Lecturer, Presentation, seminar	Assignments, Written Examination, quizzes
5. Analyze and describe motor drive applications, residential and industrial applications	Lecturer, Presentation, seminar	Assignments, Written Examination, quizzes

4. ASSESSMENT WEIGHTING

Assessment	**Percentage of final mark (%)**
Mid-term examination I	20
Quizzes	0
Mini Project	40
Final Examination	40

	100
TOTAL	**100%**

5. ACHIEVING A PASS

Students will achieve **3** credit hours for this course by passing **ALL** of the course assessments *[alternatively, list the compulsory pass assessments*]* and achieving a **minimum overall score of 50%**

NB *Ensure that ALL learning outcomes are taken into account

6. COURSE CONTENT (Indicative)

LECTURE TOPIC	TIME (HOURS)
Introduction and semiconductor switches	5
Line-frequency diode rectifiers	6
DC-DC switch mode converters	8
AC-DC inverters	6
Switching DC power supplies	6
Power conditioners and UPS	3
DC motor drives	4.5
AC induction motor drives	3.5
Residential, industrial, and electric utility applications	3
TOTAL HOURS	**45**
Plus **RECOMMENDED INDEPENDENT STUDY HOURS**	
TOTAL COURSE HOURS	

7. RECOMMENDED READING

Core text/s:

< Ned Mohan, Tore Undeland, and William Robbins, Power Electronics: Converters, Applications, and Design, 3rd edition, John Wiley & Sons, 2003 >

Library + online resources:

MIT OpenCourseWare, Power Electronics
https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-334-power-electronics-spring-2007/lecture-notes/chp1.pdf
OpenCourseWare
https://www.oercommons.org/courses/electronic-power-conversion