University of East Anglia

ACADEMIC PARTNERSHIPS

Module Outline **Part 1- as validated**

1.	**Title**	**Electronic Engineering Applications**
2.	**Level ***	**6**
3.	**Credits**	**20**
4.	**Indicative Student Study Hours**	**36 hours lectures** **164 hours self-directed learning**
5.	**Core (must take and pass), Compulsory (must take) or Optional**	**Optional**

**** Foundation Level=3 Degree Year 1 = 4 Degree Year 2 = 5 Degree Year 3 = 6***

PG (Masters) = 7

5. Brief Description of Module (purpose, principal aims and objectives)
This module extends previous knowledge of electronic principles to the pragmatic application of electronics in industrial, commercial and human-machine interface devices. It explores the circuit topologies and technologies required to make fit for purpose devices to fulfil a wide range of industrial, commercial and scientific applications. The use of simulation software such as Matlab or Simulink is to be encouraged. The module will also consider the industrial applications of AC and DC electrical machines and drives. Central to this will be an investigation into machine characteristics such as starting and braking, loading conditions, ratings, and their control.

6. Learning Outcomes - On successful completion of this module a student will be able to: (*Add more lines if required)*	
	Specific Learning Outcomes
1.	Analyse the performance of an electric machine and determine its characteristics through simulation software
2.	Utilise circuit theorems to solve problems in electrical networks
3.	Evaluate the effect of AC and DC machines on the operation and performance of an industrial control system
	Generic Learning Outcomes

1.	Demonstrate the ability to evaluate a subject through simulation
2.	Understand the applications of simulation software

7. Assessment

Pass on aggregate or Pass all components *(modules can only be pass all components if this is a PSRB requirement)*	Pass on aggregates

Summary of Assessment Plan

	Type	% Weighting	Annonymous Yes / No	Word Count/ Exam Length	Learning Outcomes Coverage	Comments
1.	Practical		50%		LO1, LO2,	
2.	Case study		50%		LO3	

Further Details of Assessment Proposals

Give brief explanation of each assessment activity listed

1. Utilise appropriate simulation software to investigate electrical machines and their characteristics as well as solving problems in typical industrial networks.
2. Appraise the effectiveness and performance of AC and DC machines through a case study approach

8. Summary of Pre and / or Co Requisite Requirements

Not applicable

9. For use on following programmes

BEng Engineering (Mechanical)

BEng Engineering (Electrical)

Module Specification **Part 2- to be reviewed annually**

1.	**Module Leader**	**John Dorward**

2.	**Indicative Content**
	A greater understanding of how the physical laws of electromagnetism and mechanics apply to practical motors and transformers; features of the common machines such as DC (series, shunt and brushless) and AC (synchronous and asynchronous) Features of the common machines such as DC (series, shunt and brushless) and AC (synchronous and asynchronous); How the physical phenomena, represented by equivalent circuit parameters, affect the device performance; relationships and similarities between different types of machine, operating characteristics of machines. The connection of a synchronous machine to a three phase, fixed frequency, AC supply (Synchronizing) using an equivalent circuit to predict the performance of various machines. Translate the complex physical nature of machines into a simple equivalent circuit representation; apply the complex number theory learnt in other modules to the analysis of electrical machines; the operation of synchronous and asynchronous AC machines in terms of rotating magnetic fields.

3. Delivery Method (*please tick appropriate box)*

Classroom Based	Supported Open Learning	Distance Learning	E-Learning	Work Based Learning	Other (specify)
Yes					

*If the Delivery Method is **Classroom Based** please complete the following table:*

	Activity (lecture, seminar, tutorial, workshop)	**Activity Duration - Hrs**	**Comments**	**Learning Outcomes**
1	Lecturers and workshops	36h		LO 1-3
2				
	Total Hours	**36h**		

If delivery method is *not* classroom based state lecturer hours to support delivery	Two 20 minutes academic tutorials per

	student per module

4. Learning Resources

To include contextualised Reading List.

Highly Recommended

Bird, J. (2013) *Electrical Circuit Theory and Technology*. Routledge.

Hughes, A. (2013) *Electric Motors and Drives: Fundamentals, Types and Applications. 4th Edition*. Newnes.

Wilamowski, B.M. and Irwin, J.D. (2011) *The Industrial Electronic Handbook: Fundamentals of Industrial Electronics*. CRC Press.

Recommended

Rehg, J.A. and Sartori, G.J. (2005) *Industrial Electronics*. Prentice-Hall.

Rashid, M.H. (2004) *Circuits, Devices and Applications*. 3rd Edition. Prentice Hall.