UNIVERSITY OF WARWICK

Proposal Form for New or Revised Modules (MA1 - version 7 - April 2014)

Approval information	
Approval Type	☐ Revised module ☒ New module ☐ Discontinue module
Date of Introduction/Change	02/10/2017
If new, does this module replace another? If so, enter module code and title:	ES185 Electrical and Electronic Circuits
If revised/discontinued, please outline the rationale for the changes:	
Confirmation that affected departments have been consulted:	Changes were made in consultations between the School of Engineering, WMG and Computer Science.

Module Summary	
1. Module Code (if known)	ES191
2. Module Title	Electrical and Electronic Circuits
3a. Lead department:	School of Engineering
3b. Teaching Split (if known):	100% School of Engineering
4. Name of module leader	Professor Phil Mawby
5. Level	UG: ☒ Level 4 (Certificate) ☐ Level 5 (Intermediate) ☐ Level 6 (Honours) PG: ☐ Level 7 (Masters) ☐ Level 8 (Doctoral) See Guidance Notes for relationship to years of study
6. Credit value(s) (CATS)	15

Module Summary	
7. Principal Module Aims	To present, in context, the fundamental concepts of circuits, devices and systems that underpin all branches of Engineering. Students will study fundamental mathematical operations of AC quantities including phasors, vectors and complex numbers. Students will study basic electronic components that make up more complex electrical and electronic circuitry. Students will also study basic control systems theory relevant to all engineering disciplines including negative feedback systems. Students will also study the basics of electrical power. To encourage development of problem solving and modelling skills in order that more advanced material can be tackled in later years.
8. Principal Learning Outcomes	By the end of the module the student should be able to: • Understand basic principles in electrical and electronic circuits. • Appreciate fundamental aspects of transistor, diode and operational amplifier operation. • Make appropriate assumptions to simplify and thus model real-life electrical and electronic components. • Calculate and measure circuit parameters.
9. Timetabled Teaching Activities (summary)	30 hours of lectures, 2 hours of revision lectures, 20 hours of laboratory exercises, 2 hours of computer-based formative tests. **Total of 54 hours.**
10. Departmental Web-link	go.warwick.ac.uk/es191
11. Other essential notes	Advice and feedback hours are available for answering questions on the lecture material (theory and examples) and past examination questions.
12. Assessment methods (summary)	80% written examination (3 hrs); 20% marked laboratory report (10 pages length); 2 x 1 hr computer-based formative test (2 hours).

For use by Strategic Planning and Analytics Office only - Do not fill in this section

Level	JACS3 Code	Teaching Split
		If not provided in 3b above

External Credit Level		Scheme	

Module Context

13. Please list all departments involved in the teaching of this module. If taught by more than one department, please indicate percentage split.

School of Engineering

14. Availability of module

Degree Code	Title	Study Year	C/OC/ A/B/C	Credits
H113	BEng Engineering	1	C	15
H114	MEng Engineering	1	C	15
H216	BEng Civil Engineering	1	C	15
H217	MEng Civil Engineering	1	C	15
H315	BEng Mechanical Engineering	1	C	15
H316	MEng Mechanical Engineering	1	C	15
H335	BEng Automotive Engineering	1	C	15
H336	MEng Automotive Engineering	1	C	15
H605	BEng Electrical and Electronic Engineering	1	C	15
H606	MEng Electrical and Electronic Engineering	1	C	15
H63W	BEng Electronic Engineering	1	C	15
H63X	MEng Electronic Engineering	1	C	15
HH75	BEng Manufacturing and Mechanical Engineering	1	C	15
HH76	MEng Manufacturing and Mechanical Engineering	1	C	15
HN11	BSc Engineering and Business Studies	1	C	15
HN15	BEng Engineering Business Management	1	C	15
G406	BSc/BEng Computer Systems Engineering	1	C	15
G408	MEng Computer Systems Engineering	1	C	15

15. Minimum number of registered students required for module to run

1 (core module).

16. Pre- and Post-Requisite Modules

None.

Module Content and Teaching

17. Teaching and Learning Activities *(totals for module – please see guidance)*

Module duration (weeks)	10

Module Content and Teaching		
Lectures	30 hours	
Seminars	None	
Tutorials	None	
Project Supervision	None	
Demonstration	None	
Practical Class/Workshops	5 laboratory exercises (2 x 4 hours introductory sessions plus 3 x 4 hours = 20 hrs total)	
Supervised time in studio/workshop	None	
Fieldwork	None	
External visits	None	
Work based learning	None	
Placement	None	
Year abroad	None	
Other activity *(please describe): e.g. distance-learning, intensive weekend teaching etc.*	• 2 x 1 hr = 2 hours revision lectures • 2 x 1 hr = 2 hours computer-based formative tests • 96 hours of guided independent learning	
18. Assessment Method (Standard)		
Type of assessment	**Length**	**% weighting**
Written Examinations	3 hours	80
Practical Examinations	None	
Assessed essays/coursework	Written report on one of three laboratory exercises (10 pages length) as specified by the department. 2 formative computer-based tests	20 0
18a. Final chronological assessment *(please see guidance*)	Written examination.	
19. Methods for providing feedback on assessment.		
• Support through advice and feedback hours. • Written feedback on marked laboratory report. • Cohort-level feedback on computer-based formative tests. • Cohort-level feedback on final examination.		
20. Outline Syllabus		
DC circuit analysis, AC Circuit Analysis AC Power		

Module Content and Teaching

Diodes and transistors
Operational amplifiers
Analogue amplifiers and circuits
Basic digital electronics
Active and passive filters (RC filters, op-amp filters etc)

21. Illustrative Bibliography

G. Rizzoni – Fundamentals of Electrical Engineering, McGraw-Hill, 2008, ISBN 978-0-07-128338-0

22. Learning outcomes

Successful completion of the module leads to the learning outcomes. The learning outcomes identify the knowledge, skills and attributes developed by the module.

Learning Outcomes should be presented in the format "By the end of the module students should be able to..." using the table at the end of the module approval form:

Please, see the table at the end of the module approval form.

Resources

23. List any additional requirements and indicate the outcome of any discussions about these.

N/A

Approval

24. Module leader's signature	Prof Phil Mawby
25. Date of approval	Teaching Policy Committee Chair's Action 16 May 2017
26. Name of Approving Committee (include minute reference if applicable)	School of Engineering and WMG Teaching Policy Committee
27. Chair of Committee's signature	Professor Gillian Cooke
28. Head of Department(s) signature	Professor Nigel Stocks

Examination Information		
A1. Name of examiner (if different from module leader)		
A2. Indicate all available methods of assessment in the table below		
% Examined	**% Assessed by other methods**	**Length of examination paper**
80	20	3 hours
A3. Will this module be examined together with any other module (sectioned paper)? If so, please give details below.		
No.		
A4. How many papers will the module be examined by?	☒ 1 paper	☐ 2 papers
A5. When would you wish the exam take place (e.g. Jan, April, Summer)?	Summer	
A6. Is reading time required?	☐ Yes	☒ No
A7. Please specify any special exam timetable arrangements.		
First exam in January		
A8. Stationery requirements		
No. of Answer books?	2	
Graph paper?	Yes	
Calculator?	Yes	
Any other special stationery requirements (e.g. Data books, tables etc)?	Engineering Data Book	
A9. Type of examination paper		
Seen?	☐ Yes	☒ No
Open Book?	☐ Yes	☒ No
Restricted?	☐ Yes	☒ No
If restricted, please provide a list of permitted texts:		

LEARNING OUTCOMES		
(By the end of the module the student should be able to....)	**Which teaching and learning methods enable students to achieve this learning outcome? (reference activities in section 15)**	**Which summative assessment method(s) will measure the achievement of this learning outcome? (reference activities in section 16)**
Understand basic principles in electrical and electronic circuits.	Lectures, laboratories	Examination and laboratory report
Appreciate fundamental aspects of transistor, diode and operational amplifier operation.	Lectures	Examination and/or laboratory report
Make appropriate assumptions to simplify and thus model real-life electrical and electronic components.	Lectures	Examination
Calculate and measure circuit parameters.	Lectures, laboratories	Examination and laboratory report