

2020-21 STMS Undergraduate Stage 2 & 3 Module Handbook

16 School of Engineering and Digital Arts

EL517 Control and Mechatronics						
Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
2	Canterbury	Whole Year	I	15 (7.5)	50% Coursework, 50% Exam	
1	Canterbury	Whole Year	I	15 (7.5)	70% Exam, 30% Coursework	

Availability

Autumn or Spring

Contact Hours

Contact hours 34

Private study hours: 116

Total study hours: 150

Learning Outcomes

Understand the classical feedback control methods adopted for design and analysis of engineering systems;

Design and analyse feedback control systems using a range of techniques;

Use effectively the specifications of mechatronic components and systems, including sensors, actuators, controllers and microprocessors;

Undertake the design, analysis, and performance of a mechatronic system.

Method of Assessment

Exam, 2 hours (50%)

5 x Homeworks (each 1-2 pages at 5%) (25%)

Practical lab-based project & presentation [5 page lab report and 10 min presentation (25%)]

Preliminary Reading

- Control Systems Engineering – By: Norman S. Nise; John Wiley & Sons; 7th Edition 2013.

- Feedback Control of Dynamic Systems – By: Gene Franklin, J. David Powell, Abbas Emami-Naeini; Pearson; 2014.

- Mechatronics: Electronic Control Systems in Mechanical and Electrical Engineering – By: W. Bolton; Pearson; 5th Edition 2011.

- Mechatronics: Electronics in Products and Processes – By: David Allan Bradley; CRC Press, 1993.

Pre-requisites

None

Synopsis <span style =

Control: Control fundamentals and modelling: Modelling of engineering processes, Laplace transfer, system description in frequency domain and time domain. Feedback control design with feedback and PID control: Digital - control: Implications of digital implementation and controller emulation methods.

Mechatronics: Sensors and transducers for mechatronic systems; Actuation: pneumatic and hydraulic actuators, mechanical actuators, electrical actuators; Microprocessors: Microprocessor systems, microcontrollers.

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EL532		Professional 3D and Compositing				
Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
2	Canterbury	Spring	I	30 (15)	100% Coursework	Epsley Mr B
2	Canterbury	Autumn	I	30 (15)	100% Coursework	

Contact Hours

60 Contact Hours

The total student workload will be 300 hours.

Department Checked

30/04/2018

Learning Outcomes

- 1 Understand the principles of modelling software and environments.
- 2 Appreciate the main constraints that affect computer based 3D modelling.
- 3 Communicate through the production of basic 3D models and animation.
- 4 Appreciate the parameters that produce good modelling solutions.

Method of Assessment

- 10-second Keyframe Transformation Animation (30%)
- 20-second Animation and reflective evaluation of 1,000 words (70%)

Preliminary Reading

See <http://readinglists.kent.ac.uk>

Pre-requisites

DIGM3400 - DIGITAL EFFECTS

Restrictions

This is not available as a wild module
None

Synopsis *

This module introduces the basic animation pipeline using industry-standard software packages. Each technical workshop session includes hands-on training in visual effects and compositing software. Practical sessions cover 3D modelling, texturing, lighting and animation.

EL536		Digital Photography				
Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
1	Canterbury	Spring	I	15 (7.5)	100% Coursework	

Availability

This is a wild module available to schools outside of EDA
This Module is capped at 40 students

Contact Hours

29 Contact hours
121 Private study hours
Total hours 150

Department Checked

29/03/2018

Learning Outcomes

1. Demonstrate knowledge and understanding of image composition, perspective and tone.
2. Edit and manipulate acquired images using software tools.
3. Communicate a message via images and text.
4. Demonstrate knowledge and understanding of scientific principles of photography including camera optics, imaging techniques and image manipulation.

Method of Assessment

(70%) Photographic portfolio.
(30%) Poster

Preliminary Reading

See <http://readinglists.kent.ac.uk>

Pre-requisites

None

Restrictions

May not be taken if enrolled on, or have completed DIGM5410
This is a wild module available to schools outside of EDA.
This module is capped at 40 students.

Synopsis

This module is concerned with the principles and practice of digital photography and photographic image editing. Topics will include: basic optics, lighting, cameras and imaging, composition and colour, files and processing, historical developments, image correction and manipulation. Theory is followed by practicals and workshops.

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EL537		Digital Portfolio				
Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
1	Canterbury	Autumn	I	30 (15)	100% Coursework	Green Dr M (EDA)

Contact Hours

Total contact hours: 33
Private study hours: 267
Total study hours: 300

Department Checked

06/03/2018

Learning Outcomes

1. Develop an online portfolio using web-authoring tools and frameworks.
2. Edit and manipulate multimedia content using suitable software tools.
3. Have an awareness of and be able to address website accessibility and performance concerns.
4. Document and reflect on the web development workflow.

Method of Assessment

Assessment of the module is 100% by coursework.

- 1) MINPRJ (65 %) - Online Portfolio (200 hour workload)
- 2) MINPRJ (10 %) - Design Mock-Up (Desktop & Mobile Designs)
- 3) MINPRJ (25 %) - Report (3,000 words)

Preliminary Reading

<https://rl.talis.com/3/kent/lists/73AD8EE0-036C-5865-D7F6-3BDB93EEBF4D.html>

Pre-requisites

DIGM3310 (EL331) Website Design

Restrictions

None

Synopsis >*

This module introduces the techniques required to design and develop interactive on-line portfolios, using HTML5/CSS/JavaScript, and the software tools which support their implementation. There is extensive practical work supporting the development of the on-line portfolio. Topics include: information architecture, responsive design, web accessibility, web frameworks and website usability testing.

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EL541		Digital Photography & Image Editing				
Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
2	Canterbury	Whole Year	I	30 (15)	100% Coursework	

Availability

This is a wild module available to schools outside of Engineering and Digital Arts
This Module is capped at 40 students

Contact Hours

Total contact hours: 49
Private study hours: 251
Total study hours: 300

Department Checked

13/06/2018

Learning Outcomes

- 1 Image composition, perspective and tone; the history of still image and its development
- 2 Editing and manipulation of acquired images using software tools.
- 3 Communicating a message via images and text.
- 4 Scientific principles of photography including camera optics, imaging techniques and image manipulation.
- 5 Photographic workflow

Method of Assessment

Main assessment methods
Photographic Portfolio – 35%
Poster – 15%
Mini Project – 45%
Online test – 5%

Preliminary Reading

See <http://readinglists.kent.ac.uk>

Pre-requisites

None

Restrictions

May not be taken if enrolled on, or have completed, DIGM5360.
This Module is capped at 40 students

Synopsis *

This module introduces you to the principles and practice of digital photography and photographic image editing, specifically photomontage. Indicative topics include: basic optics, lighting, cameras and imaging, composition and colour, files and processing, historical developments, image correction, manipulation, calculations for masking, and photomontage. Theory is followed by photographic practicals and image editing workshops, culminating in a substantial project.

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EL600		Project				
Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
1	Canterbury	Whole Year	H	45 (22.5)	100% Project	Lu Dr G
1	Canterbury	Whole Year	H	45 (22.5)	82% Project, 18% Coursework	Lu Dr G
1	Canterbury	Whole Year	H	45 (22.5)	95% Exam, 5% Coursework	Lu Dr G
1	Canterbury	Whole Year	H	45 (22.5)	100% Coursework	Lu Dr G
1	Canterbury	Whole Year	H	45 (22.5)	95% Project, 5% Coursework	Lu Dr G

Contact Hours

34 Contact Hours including lectures and weekly supervisions.
 416 Independent Study Hours.
 450 Total Study Hours

Department Checked

29/03/2018

Learning Outcomes

1. Execute a substantial piece of independent design or development engineering work
2. Write a scientific report based on the research, development and evaluation they have conducted
3. Formally present their work to individuals and groups

Method of Assessment

7% Background research, specification and initial design (To include project plan, budget, ethics, H&S and risk assessment)
 7% Oral presentation
 82% Final project report with a viva voce examination (one hour)
 4% Poster presentation

Preliminary Reading

See <http://readinglists.kent.ac.uk>

Pre-requisites

None

Restrictions

None

Synopsis *

Introduction to the project, research techniques, poster design, report structure and writing.

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EL639		Video Games Development				
Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
2	Canterbury	Autumn	H	15 (7.5)	100% Coursework	

Availability

Contact Hours

52 Contact hours
98 hour private study
Total student workload 150 hours

Department Checked

29/03/2018

Learning Outcomes

1. Demonstrate a thorough understanding of game design theory and creative practice in the field of computer game development
2. Understand and apply principles of computer game design workflow to the production of a game
3. Critically analyse technical and usability issues associated with games design and development.

Method of Assessment

(20%) Workshop exercises – mini game development
(60%) Video game design and development – a fully functioning game prototype
(20%) Video presentation – a short video on game design reflection

Preliminary Reading

See <http://readinglists.kent.ac.uk>

Pre-requisites

EENG3130 (EL313) – Introduction to Programming

Restrictions

None

Synopsis *

This module is concerned with a range of topics in video game design and development, including game physics, AI, level design, player behaviour, game rules and mechanics, as well as user interfaces. This module introduces students to game development using industry-standard software tools.

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EL667		Embedded Computer Systems				
Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
1	Canterbury	Whole Year	H	15 (7.5)	65% Exam, 35% Coursework	Assimakopoulos Dr P

Availability

Autumn or Spring

Contact Hours

Total contact hours: 25

Private study hours: 125

Total study hours: 150

Department Checked

06/08/2018

Learning Outcomes

1. Demonstrate an understanding of the design and operation of embedded systems;
2. Demonstrate an understanding of real time software and hardware system requirements;
3. Demonstrate practical experience of embedded systems based on case studies and laboratory experiments.

Method of Assessment

- Microcomputer Architecture Assignment (17.5%), 6 A4 pages
- Embedded Software Assignment (17.5%), 6 A4 pages
- Exam 2 hours (65%)

Preliminary Reading

See <http://readinglists.kent.ac.uk>

Pre-requisites

COMP5270 (CO527) - OPERATING SYSTEMS AND ARCHITECTURE
EENG5600 (EL560) - MICROCOMPUTER ENGINEERING

Restrictions

None

Synopsis *

This module introduces the theory and practice of employing computers as the control and organisational centre of an electronic or mechanical system, and examines issues related to time critical systems. It also provides exposure to practical embedded systems design through practical work, with one assignment exploring the ideas of real-time operating systems introduced in the lectures and a second using a microcomputer programmed in 'C' to control the ignition timing of a simulated petrol engine.

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EL677		Digital Communication Systems				
Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
1	Canterbury	Whole Year	H	15 (7.5)	85% Exam, 15% Coursework	Zhu Dr H

Contact Hours

Total contact hours: 36
 Private study hours: 114
 Total study hours: 150

Department Checked

06/08/2018

Learning Outcomes

1. Demonstrate an understanding of information theory, error coding and its application in modern communication systems;
2. Demonstrate an understanding of communication network architectures and protocols.
3. Demonstrate an understanding of the principles of optical communication systems and their performance

Method of Assessment

Examination 85%
 Coursework 15%

Pre-requisites

EENG5700 (EL570) Communication Principles

Synopsis *

Information theory and Shannon capacity, information measure and mutual information, source coding and channel coding/decoding, multiuser communications.

Network architecture, topology. Access networks, voice and data. Transport networks and multiplexing. Local area networks, Ethernet, WiFi. TCP/IP networks and the Internet.

Optical communication systems. Propagation in optical fibres. Sources (LEDs, laser), modulation. Photodiodes, receivers. Optical components. System power budgets, noise and dispersion.

EL885		Research Methods and Project Design for Mobile Apps				
Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
2	Canterbury	Whole Year	M	15 (7.5)	100% Coursework	
2	Canterbury	Spring	M	15 (7.5)	100% Coursework	

Contact Hours

Total contact hours: 20
 Private study hours: 130
 Total study hours: 150

Department Checked

14/11/2018

Learning Outcomes

- 1 Carry out a comprehensive literature survey on a selected topic using library and electronic information sources.
- 2 Identify the current status of a particular research area and define the state-of-art in that research area.
- 3 Identify and formulate further research, which could usefully be undertaken in a defined area of technology.
- 4 Plan a research project, including the definition of objectives, project management, experimental design and data collection and processing within time and resource constraints.
- 5 Undertake research using logical and effective methodologies.
- 6 Use common software packages for project management and presentation.
- 7 Communicate with peers by way of conference and journal publications.
- 8 Understand general issues concerning research including IPRs and research ethics.

Method of Assessment

Assignment (10%)
 Assignment (80%)
 Assignment (10%)

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Pre-requisites

None

Progression

Restrictions

None

Synopsis *

LITERATURE SURVEY

Surveys using networked electronic information sources, on-line databases, inter-library loan facilities, private communications, etc. Identification of a technical area worthy of research, definition of the state-of -the-art in a given field, definition of the research project, and research proposals. Patent search.

GENERAL ISSUES AND PRACTICE

Choosing the field of interest. Concept of originality. Research theories: background theory, focal theory, data theory. Contribution towards knowledge. Types of research project (blue sky, basic, applied and experimental research). Research uncertainty. Risk management. Research approaches.

RESEARCH PROJECT MANAGEMENT

Time management. Resources management. Project management software (MS Project). Use of logbooks. Data management. Data security. Team working skills.

RESEARCH PROCESS

MSc research projects. MPhil/PhD research projects. Academic research and industrial R&D. Project planning, proposals and budgeting. Design of experimental tests. Modelling and simulation.

RESEARCH PUBLICATIONS

Structure, content and procedures. Project reports and theses. Journal and conference papers. Technical presentations. Use of references. Writing up of abstract, introduction and conclusions. Submission, refereeing and amendments. Effective use of figures, drawings and tables. MS WORD, ENDNOTE and LATEX.

PRESENTATIONS OF RESEARCH RESULTS

Objectives and structure. Audience analysis. Rehearsal and delivery. Design of visual aids. Use of computerized projection facilities. Multi-media approach. Poster design and poster presentation. Handling questions.

INTELLECTUAL PROPERTY RIGHTS

Patents, patent rights and know-how. Copyright and copying. Design rights and registered designs. Research contracts and agreements. Confidentiality agreement.

RESEARCH ETHICS

Ethics in engineering research. Research supervision. Modelling and simulation versus real experimental work. Processing and presentation of experimental data. Obfuscation in writing up research papers.