Options for Stage 3

17th March 2017
Overview

• General information

• 2 minute sales pitches for options

• Projects
Later Today

• Current placement students
  – Go to Darwin conference suite after the talks

• All students
  – 1330-1500 Project poster fair, Eliot
General Points (1)

• Project plus 3 options per term
• Online Module registration – open until 24\textsuperscript{th} March
• Should have collected paperwork on way in
• Some modules have pre-requisites or co-requisites
General Points (2)

• Cannot choose too many level 5 (I) modules
  – Need 90 credits level 6 or above at stage 3

• Level 7 pass mark is 50%
  – CO832
Classification

- All undergraduate degree students will be classified by both the average and preponderance methods and will be awarded a degree according to the better result achieved.
Average Method

• 3 year degree:
  Stage 2  40%
  Stage 3  60%

• 4 year degree
  Stage 2  35%
  Placement  10%
  Stage 3  55%
## 3 year degree

<table>
<thead>
<tr>
<th>Class</th>
<th>Number of Credits in class or above</th>
<th>Average mark over all contributing modules of at least</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Class</td>
<td>120</td>
<td>67</td>
</tr>
<tr>
<td>Upper Second Class</td>
<td>120</td>
<td>57</td>
</tr>
<tr>
<td>Lower Second Class</td>
<td>120</td>
<td>47</td>
</tr>
<tr>
<td>Third Class</td>
<td>240</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Class</td>
<td>Number of Credits in class or above</td>
<td>Average mark over all contributing modules of at least</td>
</tr>
<tr>
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</tr>
<tr>
<td>First Class</td>
<td>180</td>
<td>67</td>
</tr>
<tr>
<td>Upper Second Class</td>
<td>180</td>
<td>57</td>
</tr>
<tr>
<td>Lower Second Class</td>
<td>180</td>
<td>47</td>
</tr>
<tr>
<td>Third Class</td>
<td>360</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>
Registering for modules …
• Online via the Student Data System

• Open until 24\textsuperscript{th} March
Student Data System

- Returning Registration
- Module Registration
Module Registration: View your modules registrations here and (if applicable) choose optional modules

Validation Session: 2016

Please Note: It is ultimately your responsibility to ensure that you are registered for the correct modules for your programme.

Students must take 120 credits in total at each Stage of study.

Programme of Study: COMPSCI: BSc - Computer Science

Faculty of Sciences: For more information about your subject requirements click here.

<table>
<thead>
<tr>
<th>Term</th>
<th>Module Code</th>
<th>Academic Year</th>
<th>Stage</th>
<th>Credit</th>
<th>Level</th>
<th>Module Title</th>
<th>Optional/Compulsory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autumn Term (weeks 1-12)</td>
<td>CO324</td>
<td>2014/2015</td>
<td>1</td>
<td>15</td>
<td>4</td>
<td>Computer Systems</td>
<td>Compulsory</td>
</tr>
<tr>
<td>Autumn Term (weeks 1-12)</td>
<td>CO322</td>
<td>2014/2015</td>
<td>1</td>
<td>15</td>
<td>4</td>
<td>Foundations of Computing I</td>
<td>Compulsory</td>
</tr>
<tr>
<td>Autumn Term (weeks 1-12)</td>
<td>CO320</td>
<td>2014/2015</td>
<td>1</td>
<td>15</td>
<td>4</td>
<td>Introduction to Object-Oriented Programming</td>
<td>Compulsory</td>
</tr>
<tr>
<td>Autumn Term (weeks 1-12)</td>
<td>CO334</td>
<td>2014/2015</td>
<td>1</td>
<td>15</td>
<td>4</td>
<td>People and Computing</td>
<td>Compulsory</td>
</tr>
<tr>
<td>Spring Term (weeks 13-24)</td>
<td>CO323</td>
<td>2014/2015</td>
<td>1</td>
<td>15</td>
<td>4</td>
<td>Databases and the Web</td>
<td>Compulsory</td>
</tr>
<tr>
<td>Spring Term (weeks 13-24)</td>
<td>CO325</td>
<td>2014/2015</td>
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<td>4</td>
<td>Foundations of Computing II</td>
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<tr>
<td>Spring Term (weeks 13-24)</td>
<td>CO320</td>
<td>2014/2015</td>
<td>1</td>
<td>15</td>
<td>5</td>
<td>Further Object-Oriented Programming</td>
<td>Compulsory</td>
</tr>
<tr>
<td>Spring Term (weeks 13-24)</td>
<td>CO328</td>
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<td>1</td>
<td>15</td>
<td>4</td>
<td>Human Computer Interaction</td>
<td>Compulsory</td>
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<tr>
<td>Autumn Term (weeks 1-12)</td>
<td>CO518</td>
<td>2015/2016</td>
<td>2</td>
<td>15</td>
<td>3</td>
<td>Algorithms, Correctness and Efficiency</td>
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<td>Autumn Term (weeks 1-12)</td>
<td>CO519</td>
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<td>2</td>
<td>15</td>
<td>5</td>
<td>Theory of Computing</td>
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<tr>
<td>Autumn Term (weeks 1-12)</td>
<td>CO539</td>
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<td>2</td>
<td>15</td>
<td>5</td>
<td>Web Development</td>
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<td>Autumn and Spring (weeks 1-24)</td>
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<td>30</td>
<td>5</td>
<td>Software Engineering</td>
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<td>Spring Term (weeks 13-24)</td>
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<td>Spring Term (weeks 13-24)</td>
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<td>15</td>
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<td>Functional and Concurrent Programming</td>
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<tr>
<td>Spring Term (weeks 13-24)</td>
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<td>2</td>
<td>15</td>
<td>5</td>
<td>Operating Systems and Architecture</td>
<td>Compulsory</td>
</tr>
</tbody>
</table>

If you have already chosen your modules but wish to amend your selection, use the tick boxes to indicate your revised preferences. Then submit your new module preferences by clicking the "Check for Submission" button.

OPTIONAL MODULE SELECTION:
### Optional Module Selection:

You must select at least 10 credits worth of modules from those below by ticking the box below the correct term. If required then select the academic year you wish to study the modules using the drop down boxes.

<table>
<thead>
<tr>
<th>Autumn Term</th>
<th>Spring Term</th>
<th>Autumn &amp; Spring Term</th>
<th>Module Code</th>
<th>Academic Year</th>
<th>Campus</th>
<th>Stage</th>
<th>Credit</th>
<th>Level</th>
<th>Module Title</th>
<th>Alternative Module Code</th>
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<tr>
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<td></td>
<td>C0600</td>
<td>2016/2017</td>
<td>Canterbury</td>
<td>20</td>
<td>6</td>
<td>Project</td>
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<td>C0620</td>
<td>2016/2017</td>
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<td>Research Project</td>
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<td>6</td>
<td>IT Consultancy Project</td>
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</table>

### Optional Module Selection:

You must select at least 90 credits worth of modules from those below by ticking the box below the correct term. If required then select the academic year you wish to study the modules using the drop down boxes.

<table>
<thead>
<tr>
<th>Autumn Term</th>
<th>Spring Term</th>
<th>Autumn &amp; Spring Term</th>
<th>Module Code</th>
<th>Academic Year</th>
<th>Campus</th>
<th>Stage</th>
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<th>Level</th>
<th>Module Title</th>
<th>Alternative Module Code</th>
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<td>C0612</td>
<td>2016/2017</td>
<td>Canterbury</td>
<td>15</td>
<td>5</td>
<td>New Enterprise Startup</td>
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<td></td>
<td>C0658</td>
<td>2016/2017</td>
<td>Canterbury</td>
<td>15</td>
<td>5</td>
<td>Programming Language Implementation</td>
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<td>C0633</td>
<td>2016/2017</td>
<td>Canterbury</td>
<td>15</td>
<td>6</td>
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<td>C0634</td>
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<td>Canterbury</td>
<td>15</td>
<td>6</td>
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<td>Canterbury</td>
<td>15</td>
<td>6</td>
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<td>Natural Computation</td>
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<td>C0641</td>
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<td>Canterbury</td>
<td>15</td>
<td>6</td>
<td>Computer Graphics and Animation</td>
<td>N/A</td>
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<td>C0643</td>
<td>2016/2017</td>
<td>Canterbury</td>
<td>15</td>
<td>6</td>
<td>Computing Law and Professional Responsibility</td>
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<td>C0645</td>
<td>2016/2017</td>
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<td>15</td>
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<td>IT Consultancy Practice 2</td>
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<td>C0646</td>
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<td>Canterbury</td>
<td>15</td>
<td>6</td>
<td>Computing in the Classroom</td>
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<td>C0657</td>
<td>2016/2017</td>
<td>Canterbury</td>
<td>15</td>
<td>6</td>
<td>Internet of Things</td>
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<td>C0659</td>
<td>2016/2017</td>
<td>Canterbury</td>
<td>15</td>
<td>6</td>
<td>Computational Creativity</td>
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<td>C0832</td>
<td>2016/2017</td>
<td>Canterbury</td>
<td>15</td>
<td>7</td>
<td>Data Mining and Knowledge Discovery</td>
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<td>EL561</td>
<td>2016/2017</td>
<td>Canterbury</td>
<td>15</td>
<td>5</td>
<td>Image Analysis &amp; Applications</td>
<td>N/A</td>
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<td></td>
<td></td>
<td>EL657</td>
<td>2016/2017</td>
<td>Canterbury</td>
<td>15</td>
<td>6</td>
<td>Embedded Computer Systems</td>
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<td>PLS02</td>
<td>2016/2017</td>
<td>Canterbury</td>
<td>20</td>
<td>6</td>
<td>Philosophy of Cognitive Science and Artificial Intelligence</td>
<td>N/A</td>
<td></td>
</tr>
</tbody>
</table>

You can view the lecture timetable for a particular module via the Module Catalogue. You will need to search for the module, when you click on the Term name a pop up window will display the draft timetable for that module.

When you are ready to submit your module preferences, click on this button.

[Check for Submission]
• Registered for Placement in 2017/18?
• Part-time?
• Cannot register online – need to email computing@kent.ac.uk
Project

• Need to register online, but there is a further process
• CO650 IT Consultancy – must have been accepted
• CO600 – need to form a group and sign up with a supervisor
• CO620 – need to sign up with a supervisor
CO600/CO620

• Deadline: 3 June 2016

• Forum

• Projects talk later
IMPORTANT

• Need to register for full set of modules

• Registration open until 24th March
Problems

Contact the Student Admin Office

computing@kent.ac.uk
Modules ...
Autumn Term

- CO633  Computer Networks and Communications
- CO634  Computer Security and Cryptography
- CO636  Cognitive Neural Networks
- CO637  Natural Computation
- CO643  Computing Law & Professional Responsibility
- CO657  Internet of Things

- CB612  New Enterprise Start-Up
Spring Term

- CO528  Introduction to Intelligent Systems
- CO641  Computer Graphics and Animation
- CO646  Computing in the Classroom
- CO658  Programming Language Implementation
- CO659  Computational Creativity
- CO663  Programming Languages: Applications & Design
- CO832  Data Mining & Knowledge Discovery
- PL583  Philosophy of Cog Sci & Artificial Intelligence (30 credits)
- EL561  Image Analysis & Applications
Spanning both Terms

• EL667 Embedded Computer Systems
• CO600 / CO620 / CO650 Project
Autumn term …
CO633
Computer Networks &
Communications
CO634
Computer Security & Cryptography

Autumn
CO636
Cognitive Neural Networks
CO636: Cognitive Neural Networks

- Electrochemical dynamics of neural circuits
- Neurons, synapses, dendrites, axons, etc.
- Types of networks (feedforward, recurrent)
- Structure of the brain

Howard Bowman

- How do artificial neural systems learn?
- Change of synaptic efficiency
- Perceptron → Backpropagation

Marek Grześ
We study AI techniques inspired by nature (mainly biology)

**Evolutionary Algorithms**: inspired by natural selection
In nature individuals evolve, become more and more adapted to environment
In Computer Science, individuals can be programs or solutions to problems, which evolve to become better and better solutions to the target problem

**Swarm Intelligence**: inspired by social insects (e.g. ants), which solve complex problems without a central coordinator

**Molecular Computing**: how biological systems (e.g. cells) perform computation
CO643
Computing Law & Professional Issues

Autumn
CO657
Internet of things
CB612
New Enterprise Start-Up
CB612: New Enterprise start-up

- Looking at how a business is started and what makes small businesses succeed.
- Practical advice about starting up a business
- Aspects: legal, planning, marketing, finance
- Main assessment: producing a viable business plan
Spring term …
Intelligent Systems

- Iterative deepening
- Puzzles
- Heuristics
- Two player games
- Constraint satisfaction
- Genetic algorithms
- Machine learning with special emphasis on mathematical aspects and foundational issues.
- Foundational questions of artificial intelligence.
CO641
Computer Graphics and Animation
Useful for a wide range of technical and artistic applications including web design, HCI and GUI development, games and simulations, digital photography and cinema, etc...

Covers subject from perspective of computing but with an appreciation of artistic process.

Major practical assignment on 3D modelling and animation with Blender.

Student work from 2015
**Computer graphics**
High-level representations in which scenes are modelled as objects. How shapes and surface details are specified. How such models are converted to images (rendered).

**Computer animation**
How motion of objects is controlled to create animations or games. Artistic, physical and behavioural approaches including human characters.

**Digital imaging and video**
Low-level representations related to hardware technologies. How such content is captured, manipulated, compressed and displayed.
CO646 Computing in the Classroom

• Module entry subject to interview

... then put it into practice
  – ten half-day visits to a local school
  – observe and help with computing teaching

• Assessment
  – devise an original project then implement and evaluate it in the school
  – reflective writing on your experience in the school
CO646 – DBS check

Need to bring paperwork to Canterbury
search google for “DBS paperwork”

• Stage 2 students
  – Will arrange a time next term

• Placement students
  – Will arrange a time in week 1 (September)
CO658
Programming Language Implementation
CO659
Computational Creativity
CO659 Computational Creativity

Getting computers to do creative things

Using computers to help us understand our creativity

What is computational creativity?

A lady called B.  It melted her.  I...

An animal left.  An animal dwells on a night.
Module Content

• Introduction to computational creativity
• Examples of computational creativity software e.g. in music, art, science, language and design.
• Evaluation of computational creativity systems (both of the quality and the creativity of systems)
• Philosophical issues concerning creativity in computers
• Comparison of computer creativity to human creativity
• Collaborative creativity between humans and computers
• Overview of recent research directions/results in computational creativity
• Practical experience in writing creative software.

• Assessment: Practical (30%), Seminars (20%), Exam (50%)
CO663
Programming Languages: Applications and Design
CO663 - Important

• Module is approved
• Not yet available to register
• Need to register for 120 credits excluding CO663
  – Send an email to computing@kent.ac.uk
  – Subject CO663
  – State which module is to be dropped
CO832
Data Mining & Knowledge Discovery
CO832 - Data Mining and Knowledge Discovery

- ~100 football games
- What the team actually did compared to what a typical team might have done
- Estimate how each team might have approached the situation
- Everything learned from data

- Masters level module (involves reading research papers)
- Machine learning
- Probability theory, information theory, and a bit of statistics
- Equations
- Assessment two is an essay

PL583
Philosophy of Cognitive Science & Artificial Intelligence
PL583
Philosophy of Cog Sci & AI

• Double module!
• Considers issues about whether machines can be intelligent, and looks at various aspects of AI from a philosophical perspective.
• 100% coursework
• Quota
EL561

Image Analysis & Applications

- Images and Image Processing Techniques
  - Image representation, analysis and manipulation techniques
- Analysing Images
  - Pattern recognition and classification techniques
- Media Security and Biometrics
  - Personal identification techniques and security
- Neural Systems Engineering
  - Practicalities of building machines which can learn and generalise

- Practical laboratories and classes
Both terms ...
Both

EL667
Embedded Computer Systems
EL667 – Embedded Computer Systems (CS & CSE)

• Embedded Computer Systems are everywhere!
  – Mobile Phones, DVD Players, Motor Vehicles…

• All are based on an embedded microcomputer running a real time operating system.

• This module covers Hardware and Software design for Embedded Systems and Real Time Operating Systems.

• Based on real Case Studies

• Includes a 1-day lab class – Engine Management Simulator.
IMPORTANT

• Need to register for full set of modules

• Registration deadline is 24\textsuperscript{th} March
After the Projects talk…

• Current placement students
  – Go to Darwin conference suite

• All students
  – 1330-1500 Project poster fair, Eliot