

## Basic details

|                                                     |                                                                                                                                                                                                                                                                                                                  |                 |                                               |
|-----------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-----------------------------------------------|
| UID                                                 | <input type="text"/>                                                                                                                                                                                                                                                                                             | Cohorts covered | <input type="text"/>                          |
| Long title                                          | <input type="text" value="Software Systems"/>                                                                                                                                                                                                                                                                    |                 |                                               |
| New code                                            | <input type="text" value="ELEC50014"/>                                                                                                                                                                                                                                                                           | New short title | <input type="text" value="Software Systems"/> |
| Brief description of module<br>(approx. 600 chars.) | <input type="text" value="This module aims to increase your existing software knowledge from 1st year and teaches you to apply it in more complex systems. Principles and mechanisms required to integrate operating system resources and implement communication patterns into your programs are introduced."/> |                 |                                               |
| Available as a standalone module/ short course?     | <input type="text" value="N"/>                                                                                                                                                                                                                                                                                   |                 |                                               |

## Statutory details

|              |                                      |                                 |                                |             |
|--------------|--------------------------------------|---------------------------------|--------------------------------|-------------|
|              | ECTS                                 | CATS                            | Non-credit                     | HECOS codes |
| Credit value | <input type="text" value="5"/>       | <input type="text" value="10"/> | <input type="text" value="N"/> |             |
| FHEQ level   | <input type="text" value="Level 5"/> |                                 |                                |             |

## Allocation of study hours

|                   | Hours                              |                                                                            |
|-------------------|------------------------------------|----------------------------------------------------------------------------|
| Lectures          | <input type="text" value="20"/>    |                                                                            |
| Group teaching    | <input type="text" value="10"/>    | <i>Incl. seminars, tutorials, problem classes.</i>                         |
| Lab/ practical    | <input type="text" value="10"/>    |                                                                            |
| Other scheduled   | <input type="text" value="0"/>     | <i>Incl. project supervision, fieldwork, external visits.</i>              |
| Independent study | <input type="text" value="85"/>    | <i>Incl. wider reading/ practice, follow-up work, completion of assess</i> |
| Placement         | <input type="text"/>               | <i>Incl. work-based learning and study that occurs overseas.</i>           |
| Total hours       | <input type="text" value="125"/>   |                                                                            |
| ECTS ratio        | <input type="text" value="25.00"/> |                                                                            |

## Project/placement activity

|                                |                                 |
|--------------------------------|---------------------------------|
| Is placement activity allowed? | <input type="text" value="No"/> |
|--------------------------------|---------------------------------|

## Module delivery

|               |                                             |       |                      |
|---------------|---------------------------------------------|-------|----------------------|
| Delivery mode | <input type="text" value="Taught/ Campus"/> | Other | <input type="text"/> |
| Delivery term | <input type="text" value="Term 1"/>         | Other | <input type="text"/> |

## Ownership

|                                 |                                                                    |
|---------------------------------|--------------------------------------------------------------------|
| Primary department              | <input type="text" value="Electrical and Electronic Engineering"/> |
| Additional teaching departments | <input type="text"/><br><input type="text"/>                       |
| Delivery campus                 | <input type="text" value="South Kensington"/>                      |

## Collaborative delivery

Collaborative delivery? N

External institution N/A  
 External department N/A  
 External campus N/A

## Associated staff

| Role          | CID | Given name | Surname |
|---------------|-----|------------|---------|
| Module Leader |     | Sarim      | Baig    |
|               |     |            |         |
|               |     |            |         |
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|               |     |            |         |
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|               |     |            |         |

## Learning and teaching

### Module description

|                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Learning outcomes              | <p>By the end of this module you will be able to:</p> <ul style="list-style-type: none"> <li>- Describe the principles and concepts involved in key operating systems areas such as virtualization, synchronization, and persistence</li> <li>- Effectively use and implement various operating system services from the shell and from within your programs</li> <li>- Implement multithreading, multiprocessing, inter-process communication, and synchronization mechanisms in your applications</li> <li>- Apply parallelization to speed up traditional algorithms and data structures</li> <li>- Assign different physical and abstract components of networking to the OSI stack</li> <li>- Describe the principles and concepts involved in designing distributed systems and Internet applications</li> <li>- Think creatively in response to an awareness of/requirement for a problem to be solved</li> <li>- Decompose a software system into loosely coupled components</li> <li>- Design and implement a multi-component networked software system</li> <li>- Analyse a software system to identify potential security issues</li> </ul> |
| Module content                 | <p>Operating Systems</p> <ul style="list-style-type: none"> <li>- Processes, threads, and inter-process communication</li> <li>- Synchronization techniques</li> <li>- Scheduling algorithms</li> <li>- Memory management</li> <li>- File systems and storage</li> </ul> <p>Networking</p> <ul style="list-style-type: none"> <li>- The OSI and TCP/IP stacks</li> <li>- Socket programming</li> <li>- Client-server models</li> </ul> <p>System architecture</p> <ul style="list-style-type: none"> <li>- Component Architectures</li> <li>- Integration testing</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Learning and Teaching Approach | <p>Assessment is via mid-term multiple-choice exam during Autumn, which covers both knowledge and skills developed in lab exercises and problem-class sheets. There will be 4 individual programming tasks during the term. Individual knowledge is then assessed using a written exam in Summer term.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

|                              |                                                                                                                                                                                                                                                                                                                    |
|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Assessment Strategy          | The module will be assessed through a combination of written examinations testing theoretical concepts taught during the course, and practical programming exercises that reinforce applied understanding. This balanced approach encourages both conceptual clarity and hands-on proficiency in software systems. |
| Feedback                     | Formative feedback will be provided on an ongoing basis: in the classroom (as general comments to mentimeter answers) and in the labs (as individual students ask for comments on their code).                                                                                                                     |
| Reading list                 | A reading list will be provided in-session                                                                                                                                                                                                                                                                         |
| Required equipment/ software | NA                                                                                                                                                                                                                                                                                                                 |

## Quality assurance

|                        |               |
|------------------------|---------------|
| Date of first approval |               |
| Date of last revision  | November 2024 |
| Date of this approval  | December 2025 |

## Office use only

|                    |  |
|--------------------|--|
| QA Lead            |  |
| Department staff   |  |
| Date of collection |  |

Module leader Sarim Baig

|               |  |
|---------------|--|
| Date exported |  |
| Date imported |  |

Notes/ comments

Template version

## Assessment details

### Grading method

Numeric

Pass mark

40%

## Assessments

[illegible]

100%