# Solent University Module Descriptor

## **Module Code: COM411 Module title:** Problem Solving Through Programming

### **Why is this module important?**

Problem solving is concerned with identifying problems, devising possible solutions and taking an appropriate course of action. Problem solving is a fundamental skill that allows us to tackle problems of varying scope in a systematic manner. It is also the single most desirable and sought-after skill in the computing profession. All software is designed to solve a human problem and comprises of an array of solutions to a series of smaller problems. Software is developed using computer programming whereby computing problems are transformed into instructions that make up a software solution. In this module you will develop your problem-solving skills through computer programming and the development of software solutions. You will gain knowledge and skills that are highly desirable in the computing profession and are essential to the course of your study.

### **What you will learn on this module**

You will be introduced to the problem-solving process and its importance in the computing profession. You will learn to tackle computer problems of varying scope in a systematic manner. You will learn core computer programming concepts such as data types, expressions and control structures as well as fundamental software development principles and techniques. Whilst the coding aspect of computer programming will be explored in some depth, the importance of understanding the problem domain, planning and subsequently evaluating a solution will be emphasised. You will learn techniques related the design, implementation and testing of software solutions and gain an appreciation for their role in the context of the computing profession and the wider industry.

**How you will learn**

This module emphasises problem solving through practice and so you will learn by completing weekly lab-based practical sessions. These sessions will introduce you to the key concepts and will provide you with opportunities to develop your knowledge and skills. Each lab session will consist of computer problems of increasing challenge and scope and where appropriate collaborative working will be encouraged.

**How much time the module requires**

This module is a 20-credit module. For a 20-credit module, you are expected to study for 200 hours (which equates to 10 hours per credit). This total learning time is made up of contact time, directed learning tasks, independent study and assessment activity.

### **How you will be assessed**

**Tasks which help you to learn and prepares you for summative tasks (Formative):**

You will have the opportunity to complete activities throughout the module which develop your understanding and provide opportunities for feedback. Activities will consist of practical problem-solving challenges, mini-projects, quizzes, classroom interactions and, where appropriate, group work. Feedback will be provided throughout.

#### **Tasks which count towards your degree (summative):**

The module has two summative assessments each of which will require you to develop a solution for a computer problem or a series of computer problems. You will be assessed on your understanding and application of problem-solving skills through computer programming. The first summative assessment will be in the form of a time-constrained assessment where you will be required to create small computer programs to solve a series of problems. This assessment is supervised and will take place in class. The second summative assessment will require you to develop a software product to address a more challenging problem and write an accompanying report. This will be developed using a suitable problem-solving process and be expected to adhere to industry standards and best practice. This includes the use of a version-controlled repository and adherence to relevant legal, social, ethical and professional standards as related to your software product and the profession.

## **When assessment does not go to plan:**

You will receive feedback on your attempt at the original assessment which will help you identify areas strengths and improvements. You will then have an opportunity to complete a modified version of the original assessment.

### **What you will be able to do after the module:**

### Describe a problem-solving process and its value in the computing profession as well as the wider context.

### Design, implement, test, and debug software solutions to meet requirements

1. Demonstrate awareness of contemporary techniques for the design, development, testing, correcting, deploying and documenting of software solutions from specifications and/or problem descriptions, using relevant standards and tools.
2. Apply analytical and critical thinking skills to systematically analyse and apply structured problem-solving techniques to computer problems.
3. Interpret and follow approaches to version and source control
4. Recognise legal, social, ethical & professional issues related to software development.

### **How this relates to the dimensions of Solent’s Real-world curriculum framework**

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| **Dimensions** | **How students learn** | **How students are assessed** |
| Students are challenged to think in critical, creative and applied ways | Students will complete programming challenges that vary in scope. | Students will implement software solutions from problem descriptions and/or specifications. |
| Students are inspired to do research through inquiry, curiosity and problem-solving | Students will be tasked to develop mini-projects each of which addresses problems with multiple solutions. This will require students to research and apply appropriate techniques. | Students will construct software solutions informed by research of appropriate techniques. |
| Students experience an intellectually stimulating curriculum which inspires them to learn for life | Students will identify and work on authentic and real-world problems. | Students will link theory and practice to make outward facing software artefacts which will form part of their outward facing portfolio. |
| Students reflect and grow inwardly, socially and ethically to be able to confront the challenges of the world | Students will learn about the legal, social, ethical and professional issues that are relevant to the computing profession and inform their practice. | Students will apply suitable techniques to their software development to ensure compliance to professional standards. |
| Students face outward to the community, industry and the global environment | Students will be encouraged to attend presentations by members from the computing industry and develop an online portfolio that can be shared with software development community and target the computing industry. | Students will be able to develop and demonstrate their practice through their public portfolio and receive formative feedback on their portfolio. |
| Students learn from authentic, engaging and programmatic assessment | Students see the value of formative tasks and feedback because they are creative, meaningful and engaging | Students will undertake assessment which mirrors practice in the discipline |

### **Summative assessment details**

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| AE1 | Weighting: | 50% |
|  | Assessment type: | Time Constrained Assessment |
|  | Aggregation: | Aggregated to AE2 |
|  | Length/duration: | 4 hours |
|  | Online submission: | Yes |
|  | Grade marking: | Yes |
|  | Anonymous marking: | Yes |

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| AE2 | Weighting: | 50% |
|  | Assessment type: | Software Product with Report |
|  | Aggregation: | Aggregated to AE1 |
|  | Length/duration: | 2000 words |
|  | Online submission: | Yes |
|  | Grade marking: | Yes |
|  | Anonymous marking: | Yes |

### **Module Author:** Prins Butt

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| Module Title: Problem Solving Through Programming | | | |
| Credit Points: | 20 | Module Code: | COM411 |
| FHEQ Level: | 4 | School/Service | SMAT |
| Module Delivery Model: | CD | Max/Min student numbers | Not Applicable |
| Module Leader: | Prins Butt | | |
| HECOS code | 100956 | | |

### Module change history:

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| --- | --- | --- | --- |
| Module Approved/Year Implemented/Code | March 2019 | 2020/21 | COM411 |
| Module modified/Year Implemented/Code |  |  |  |
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