**Southampton Solent University
RECOGNITION OF PRIOR LEARNING: MODULE LEARNING OUTCOMES**

 **To be completed by applicant**

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| **Name:** |  |
| **Student number:** | **Unknown** |
| **Course and Level:** | BSc Digital Technology Solutions Degree Apprenticeship (Lvl6)**Pathway: Software Engineer** |
| **Unit(s) requesting RPL approval:** |  |
| **Evidence supplied: Certificated/Experiential (Delete as appropriate) Indicate source of evidence e.g., academic transcript, unit descriptors, portfolio etc.** |  |

**RPL is discussed at your interview. Listed below are the common first year (Level 4) modules applicants apply for RPL for:** [Problem Solving COM411](https://martinsolent.github.io/bdats/docs/L4_modules/child_1.html) - All Pathways, [Introduction to Networks & Security COM412](https://martinsolent.github.io/bdats/docs/L4_modules/child_2.html)

**These are other Level 4 modules:**

* [Introduction to Databases COM417](https://martinsolent.github.io/bdats/docs/L4_modules/child_5.html) - All Pathways
* [Data Structures, Algorithms & Mathematics COM421](https://martinsolent.github.io/bdats/docs/L4_modules/child_7.html) – Software & Data Pathways
* [Software Testing & Reliability Engineering COM422](https://martinsolent.github.io/bdats/docs/L4_modules/child_8.html) – Software Pathway
* [Systems Analysis & Design Work Based Project COM423](https://martinsolent.github.io/bdats/docs/L4_modules/child_9.html) - All Pathways

**All BDATS Pathway Information can be found** [**here**](https://martinsolent.github.io/bdats/docs/pathways/)

**DELETE THE MODULE INFORMATION NOT APPLICABLE TO YOUR RPL APPLICATION.**

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| COM421 - Data Structures, Algorithms & MathsWhy is this module important?It is often the case when writing software that you will need to instruct your program to perform a series of steps in order to solve a complex task or calculate the answer to a complex problem. This series of instructions is known as an algorithm and it essentially tells the program how to solve a problem.The nature of programming means that there are many ways to go about solving a single problem, but thought should also be given to optimisation – solving the task as fast as possible whilst minimising the resources that need to be allocated. Algorithms are part of the life of a programmer and thus this module will aim to ensure that you are comfortable writing them, as well as being made aware of existing algorithms that are frequently used.Programmers need to be aware of data structures and mathematical principles that underpin the algorithms they write. This will help improve your understanding of what is happening, improve your overall problem-solving capabilities and help you to be a more effective programmer.What you will learn on the module?You will gain hands on experience applying a range of algorithms and data structures to problems. As well as creating your own algorithms, you will also be made aware of existing algorithms that are at your disposal and understand how they work.You will also learn about numerous data structures that you can use, how they function and utilise them to solve problems.In addition, you will develop your mathematical abilities as you learn about common mathematical concepts that underpin both the data structures and the algorithms that you use, as well as learning mathematical structures that are useful to programming and computing in general.You will develop your problem-solving skills as you create your own algorithms or apply existing algorithms in order to solve the problems you are given.What you will be able to do after the module1. Understand and apply the computational maths required to be a software developer.
2. Distinguish between various algorithm problem solving strategies.
3. Problem-solve a range of real-world scenarios.
4. Discuss the classification of algorithms and mathematical computational problems.
5. Communicate findings using a variety of media.
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| **Applicant Evidence:** |
| Software Testing and Reliability Engineering COM422**Why is this module important?**Software testing is a vital part of the software lifecycle. If software does not work as expected then this can lead to problems resulting in a loss of time, money and reputation.Testing is not strictly about running tests and looking for logic errors. It is a process consisting of many different practices that need to be understood. Knowledge in testing will help you build more robust and reliable software that meets the expectations of both users and clients.**What you will learn on the module**You will learn about the testing process and the different types of tests that are commonly used, these will include component/module testing, usability testing and user acceptance testing.You will also analyse requirements and develop testing strategies for given circumstances and you’ll get hands on with number of tools that will aid you in the testing process.How you will learn?This module attempts to underpin the underlying theory of testing processes and how this is applied in practice. As such, your first session each week will start with the lecturer presenting the topic and delivering the important concepts that you will need to know for that week. Then you will have the opportunity to apply these practices in a computer lab.You will also have access to resources and support material which will be published to Solent Online Learning to aid you in your studies.What you will be able to do after the module1. Explain the different approaches to testing
2. Identify and apply appropriate testing practices
3. Select and use appropriate testing tools
4. Analyse requirements and design appropriate testing strategies
5. Evaluate selected tools and test plans

Summative assessment details**AE1 Weighting: 100%**Report (2000 Words) |
| **Applicant Evidence:** |
| **Mapping to show the learning outcomes of the units being RPL’d, against the appropriate detailed evidence.** |
| **Problem Solving Through Programming COM411 – ALL PATHWAYS*****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.**What you will be able to do after the module:** 1. Describe a problem-solving process and its value in the computing profession as well as the wider context.
2. Design, implement, test, and debug software solutions to meet requirements
3. 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.
4. Apply analytical and critical thinking skills to systematically analyse and apply structured problem-solving techniques to computer problems.
5. Interpret and follow approaches to version and source control
6. Recognise legal, social, ethical & professional issues related to software development.

**The module is split into 4 blocks:*** Block 1: Basics - fundamental programming concepts such as input/output, conditional statements, loops, functions, and modules.
* Block 2: Data - working with data sources such as CSV and JSON. Storing data in data structures such as lists and dictionaries.
* Block 3: Visualisation – **visualising** data using popular visualisation libraries.
* Block 4: OOP - learn key object-oriented programming concepts and applying this to program construction.

**Tech Stack & Tools:**[Python](https://www.python.org/) (+ a range of python modules)[Matplotlib](https://matplotlib.org/)[PyCharm](https://www.jetbrains.com/pycharm/)[Git](https://git-scm.com/)[GitHub](http://github.com/)As a student you can get a GitHub student education account FREE, just sign up for a GitHub account with your university email then verify that you are a student here: [education.github.com/pack/join](https://education.github.com/pack/join)**Summative assessment details****AE1 Weighting: 50%** - Time Constrained Assessment (TCA) 4 hours**AE2 Weighting: 50%** - Software Product with Report 2000 words |
| **Applicant Evidence:** |
| Introduction to Networks & Security COM412 - ALL PATHWAYSCisco Networking Academy CCNAv7 curriculum, Introduction to Networks (ITN). This is the first of three courses that are aligned to the CCNA Certification Exam. ITN contains 17 modules, each with a series of topics.<https://www.netacad.com/courses/networking/ccna-introduction-networks> *Why is this module important?* - If you think digital networks are important now, soon there will be over 50 billion connections between people, places, and things. Get a VIP pass to your future.Networking knowledge will enhance your career in any field because every organization relies on connectivity for success. With the right skills, you can embark on a well-paid career in information and communications technology. You can choose to join a high-tech firm or bring these skills to a different field that you love, or even start your own company.*What you will learn on the module* - Firstly we will explore networks by using a network simulator to learn what devices and connections are used. We will then understand and apply the principles of networking, protocols, and associated technologies by doing various online activities. We will learn the structure and contents of network models by reading online materials and testing knowledge with mini online quizzes.You will then practise the maths required to be a network engineer by calculating addressing schemes. We will Investigate compare transport protocols, discover what network services are necessary and apply them.You will also learn how to install and configure network components, including switches and routers and firewalls by doing practical activities with real equipment.You will apply structured approaches to troubleshooting network issues and repair faults in hardware, software products and the network and communicate effectively with your colleagues in a variety of situations.You will also apply diagnostic tools and techniques to identify the causes of network performance issues developing analytical skills. You will also manage network devices and apply configurations for management access control.You will identify attacks concepts techniques and the approach of cybersecurity and compare types of malwares, you will learn how to protect your data, privacy and the cybersecurity domain and compare the tools and methods for incident response, prevention and detection.What you will be able to do after the module1. Understand and apply the principles of networking, protocols and associated technologies
2. Understand and apply the maths required to design an addressing scheme
3. Design install and configure a simple computer network using routers and switches
4. Recognise any risks or safety issues associated with the safe operation of computing and network systems
5. Recognise legal, social, ethical & professional issues related to computer networks
6. Demonstrate knowledge of information security issues, security threats, firewalls and vulnerabilities

Summative assessment details1. **Complete a Multi-choice answer (MCA)** test in class to assess your knowledge of the models of computer networking. To specify the various network protocol uses, structures of data, and methods of addressing. To assess your ability to calculate ranges of addresses using the appropriate mathematics. To identify relevant network applications and services. To give examples of configuration of network devices and how you monitor and manage network device configuration and operation.
2. **Complete a time constrained assignment (TCA)** in class which will include designing and configuring a medium sized network with network devices applying network routing optimisation and access control.

**AE1 Weighting: 50% -** Multi-choice answer (MCA) 90 mins**AE2 Weighting: 50% -** Time constrained assignment (TCA) 120 mins |
| **Applicant Evidence:** |
| Systems Analysis & Design Work Based Project COM423*Why is this module important?* Systems analysis is a project-driven process that ensures that information systems are designed, developed and maintained in ways that provide optimum value to companies and clients. It is concerned with the identification and examination of business requirements and problems and the creation of efficient solutions. It is effective when all sides of the problem are reviewed, and when more than one design solution can be proposed. This module will also provide an introduction to project management which is very useful. This module is important for Apprentices as it allows them to practically apply the knowledge gained in the classroom and blended sessions into the workplace.*What you will learn on the module* In this module, the key components of business information systems are identified and dissected to reveal the essential elements considered in systems analysis. Theoretical approaches towards the planning and execution of effective design strategies are supported by practical case study examples. You will learn how to identify user requirements in order to analyse the functionality of systems and to produce basic design specifications for a spectrum of commercial and industrial situations. They will also be introduced to the management of project life cycles that govern the process of systems analysis. In doing so, they will be introduced to and use software tools that are current in wider industrial contexts. Sessions will also be run to introduce formal academic writing, researching and referencing.The module will cover the context for business information systems and the analysis stages of the systems development life cycle in breadth. The stages covered will be project initiation, feasibility, investigation and analysis. For each stage, the objectives, scope, prerequisites, tasks, resources, techniques and deliverables are identified.Initiation: Identification of the need for a new updated system initiated by new requirements or specific problems. The agreement on terms of reference before the start of any feasibility study.Feasibility: Investigation of the viability of a project in terms of the financial, technical and operational viewpoints.Investigation: The investigation of a system using fact-finding techniques to gather information that is used for later analysis.Analysis: The analysis of facts found at the investigation stage will culminate in a statement of user requirements. This approach will take account of both structured and object-oriented methods, and these will also be used to produce an updated version of the user requirements document to re-address appropriate initial analyses as system requirements change.Design: Incorporates the transition from analysis to design using conceptual diagramming techniques as appropriate for both structured and object-oriented methods.Construction and Implementation: Takes account of elementary planning control and scheduling, presentation of a proposed new system, implementation tasks including testing, installation strategies, handover, training, quality assurance and documentation.Maintenance and Review: Including amendment procedures, configuration management, and post-implementation review.Project ManagementWhat you will be able to do after the moduleModule is formally and summatively assessed using a portfolio of tasks consisting of individual projects and a structured report in which you are required to draw on a broad knowledge of the systems analysis process. The individual project requires a detailed analysis of a specific information system and use appropriate techniques and methodologies to solve a defined business problem or need.1. Identify and explain the stages of information system development within organisations or in business contexts including analysis and design methodologies and their associated techniques.
2. Apply the principles and techniques of systems analysis to a specific business development problem or requirement, including the use of software support tools.
3. Investigate, analyse and critique a business system using recognised systems development concepts and techniques. Offers suggestions for process and cost (time and money) improvement.
4. Analyse and build models using appropriate computer packages and modelling techniques.
5. Present reports and results clearly, in a variety of ways, accurately and to a specified format.
6. Reflect on interaction with stakeholders.

Summative assessment details**AE1 Weighting: 100% -** Portfolio Report with supporting artefacts (2000 Words) |
| **Applicant Evidence:** |
| Introduction to Databases COM417*Why is this module important?* - Databases are a major component of ICT systems. Mobile apps, social networks, video games and most software systems deploy databases or deal with data somehow. In this module you are introduced to the skills and concepts required to develop and use relational databases. You will learn how to write programs interacting with databases and how to create them. This provides a solid foundation to prepare for modules involving web, internet or software development elsewhere on your course.*What you will learn on this module***Retrieving Data*** Basic concepts of relational model
* SQL for queries including joins, grouping and sub-queries
* SQL functions for statistical analysis

**Database Design and Implementation*** Normalisation
* ER modelling
* SQL to create tables including inserting/updating/deleting records
* Primary and referential integrity for single column keys
* Check constraints

**Monitoring and Administering Databases*** Authenticated access to database tools and applications
* Monitoring of database usage
* Access control and user permissions

**Programming for databases*** Key programming concepts
* Using cursors in programming languages
* Writing PLSQL procedures
* Creating Triggers and Functions
* Legal Requirements concerning data
* Including GDPR, Computer Misuse Act

*What you will be able to do after the module:*1. Explain key issues in the development and administration of relational databases and their role in modern IT systems.
2. Discuss the use of SQL functionality to create information from data.
3. Apply conceptual modelling techniques to the design and implementation of a simple database.
4. Apply enterprise-level database software tools in the development, implementation and testing of SQL-based database solutions.
5. Evaluate data using statistical techniques to provide meaningful information.
6. Describe the appropriate ethical and legal methods for data collection, usage and storage.**Summative assessment details**

**AE1 Weighting: 100% -** Portfolio including software artefacts 2000 words |
| **Applicant Evidence:** |

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| --- | --- |
| **Student signature:** |  |
| **Date:** |  |

***Note for the Academic Assessor:***

***Please assess the evidence, add your comments, sign and return the form in electronic format to****:* *Student.Registry@solent.ac.uk*

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| --- | --- |
| **Comments**  |  |
| **Does the evidence provided indicate equivalence to the SSU unit(s) outcome(s)?** |  |
| **Academic Assessor:** | **Martin Reid** |
| **Signature:** |  |
| **Date:** |  |

Appendices add evidence of certification here