Level 3 - Open Systems in Computing

Level 3

Level 3, Unit 1 - Computational Thinking (10 credits)

1. understand the computational problem solving process.	2. be able to apply number systems and logic to computing problems.	3. analyse problems to create computational solutions.
1.1 consult with relevant industry professionals and academics to improve solutions. [1]	2.1 use mathematical functions in practical algorithms. [2]	3.1 work collaboratively and persistently to achieve a good computational solution. [3]
1.2 iteratively refine solutions to improve efficiency and effectiveness. [4]	2.2 explain how digital computers can work with a full range of real numbers. [5]	3.2 explain computational solutions in terms of sequential automated steps. [6]
1.3 organise data in terms of logical patterns. [7]	2.3 analyse expressions in boolean logic to simplify them. [8]	3.3 identify practical problems suitable for a computational solution. [9]
1.4 use multiple algorithms to solve complex problems. [10]	2.4 explain the difference between packed and unpacked binary coded decimal. [11]	3.4 find ways of making computational solutions more efficient. [12]
1.5 demonstrate how abstractions represent complex data structures and instructions. [13]	2.5 explain the relationship between binary and hexadecimal numbers. [14]	3.5 analyse complex problems into simpler related components. [15]

Level 3, Unit 2 - Principles of Software Engineering (10 credits)

1. understand the role of the target audience.	2. understand strategies for maintaining quality.	3. adopt suitable methods to match circumstances.
1.1 describe methods for	2.1 explain and	3.1 explain the different

providing feedback to users from errors in the code. [17]	demonstrate the importance of courage and persistence in solving problems. [18]	demands of large scale and small scale projects. [19]
1.2 receive user feedback and act positively. [20]	2.2 explain a sound testing strategy. [21]	3.2 specify a documentation strategy. [22]
1.3 describe the rationale for release early, release often. [23]	2.3 demonstrate quality strategies through small scale projects. [24]	3.3 compare procedural and object oriented programming. [25]
1.4 compare the user role in a range of software development models. [26]	2.4 establish clear communication channels with critical reviewers. [27]	3.4 describe an open source community project and its methods. [28]
1.5 explain principles of user interface design. [29]	2.5 identify design techniques to reduce risk. [30]	3.5 compare formal and agile methods. [31]

Level 3, Unit 3 - Delivering a Software Project (10 credits)

1. plan a suitable project.	2. carry out a significant practical software project.	3. communicate project outcomes to others.
1.1 meet deadlines. [33]	2.1 show courage and determination to overcome problems. [34]	3.1 make a final presentation to a critical audience. [35]
1.2 present the proposal to critical experts. [36]	2.2 produce source code that has effective embedded documentation. [37]	3.2 gather opinions through peer review. [38]
1.3 identify an area of interest and scope the project. [39]	2.3 test code regularly involving third parties. [40]	3.3 provide regular updates on progress to a mentor. [41]
1.4 make modifications as a result of feedback. [42]	2.4 use logical techniques to debug code. [43]	3.4 use IT tools to enhance communication. [44]
1.5 agree and adopt the software development method. [45]	2.5 produce substantial code that works effectively. [46]	3.5 analyse issues arising and establish priorities for resolution. [47]

Level 3, Unit 4 - Open Systems and Community Development (10 credits)

1. understand the process of community development.

1.1 explain the importance of distributed revision control systems in community software development. [49]

1.2 explain the relationships between commercial and volunteer interests in a software development community. [52]

1.3 compare and contrast the processes of software development communities. [55]

1.4 describe Sourceforge and its role in community development. [58]

1.5 explain the principles of the Open Source Way. [61]

2. understand licensing and intellectual property.

2.1 describe the advantages and disadvantages of software patents. [50]

2.2 describe and explain the freedoms associated with free and open source software. [53]

2.3 explain the terms trademark, copyleft, creative commons, and public domain. [56]

2.4 analyse the effects of digital technologies on the enforcement of intellectual property rights. [59]

2.5 explain the relationship between copyright and licensing. [62]

3. understand commercial models for software development.

3.1 describe an advertising model to support software development. [51]

3.2 describe the perpetual license model for software development. [54]

3.3 describe the dual licensing model for software development. [57]

3.4 describe the fremium model for software development. [60]

3.5 describe the software as a service model. [63]

Level 3, Unit 5 - Computer Systems Management (10 credits)

1. set up systems.

1.1 solve problems in systems setup

2. support system storage and security.

2.1 write a risk assessment for

3. maintain systems.

3.1 provide effective support for

4. understand key internet systems.

4.1 explain the role of an internet

and configuration. [65]	system security including passwords and malware. [66]	system users. [67]	service provider. [68]
1.2 customise the display to personal preference. [69]	2.2 devise and implement a backup strategy. [70]	3.2 set up a secure virtual connection to manage a system from a remote location. [71]	4.2 explain the importance of TCP/IP. [72]
1.3 install and set up an operating system. [73]	2.3 describe a range of storage methods and their strengths and weaknesses. [74]	3.3 install software updates and dependencies. [75]	4.3 describe the terms HTML, W3C and HTTP. [76]
1.4 set up network connections. [77]	2.4 set up and understand how to customise a firewall for network connection. [78]	3.4 install and remove applications. [79]	4.4 explain the effects of proprietary standards and lock-in. [80]
1.5 set and customise boot sequence and options. [81]	2.5 format and partition storage devices. [82]	3.5 set up cron jobs to automate regular procedures. [83]	4.5 explain the function of a web server. [84]

Links
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[21] https://theingots.org/community/cpl3u2psex#2.2

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