

**MODULE SPECIFICATION**

<b>Name of Module</b>		Programming and Problem Solving I					
<b>Parent School/Dept</b>		<b>Computer Science/Information Systems</b>					
<b>Programme(s) where module is offered</b>		BSc Computer Science with Electrical Engineering; BSc Computer Science with Economics; BSc Computer Science with Business; BSc Computer Science with International Relations; BSc Computer Science with Political Science; BSc Information Systems with Electrical Engineering; BSc Information Systems with Economics; BSc Information Systems with Business; BSc Information Systems with International Relations; BSc Information Systems with Political Science;					
<b>Status</b> (core, option, free choice)		Core		<b>Pre-Requisite Modules or Qualifications</b>		None	
<b>FHEQ Level</b>	4	<b>Unit Value</b>	8 ECTS	<b>Module Code</b>	CS110	<b>Module coordinator</b>	Željko Jurić
<b>Term taught</b>		Autumn		<b>Applicable From</b>		2014	

**Educational Aims of the Module**

The main aim of the module is to introduce the art of programming, as well as other means of using a computer to solve problems. Lectures build upon this basis to provide basic programming knowledge in C++ programming language. Laboratory work and programming assignments are an integral part of this module.

**Module Outline/Syllabus**

- Basic structure of C++ programs. Variables and expressions. Input and output.
- Control statements. Branches. Loops.
- Functions. Parameter passing by value and by reference. Recursion.
- Arrays and vectors. Multidimensional arrays.
- Pointers and pointer-based strings.
- Basic introduction to classes and objects.

**Student Engagement Hours**

Type	Number per Term	Duration	Total Time
Lectures	30	2 hours	60 hours
Tutorials	30	2 hours	60 hours
Total Guided/Independent Learning Hours			<b>80 hours</b>
Total Contact Hours			<b>120 hours</b>
<b>Total Engagement Hours</b>			<b>200 hours</b>

**Assessment Method Summary**

Type	Number Required	Duration / Length	Weighting	Timing/Submission Deadline
Final exam	1	180 minutes	50%	End of semester
Mid-term exam	1	90 minutes	20%	Mid-semester (8 <sup>th</sup> week)
Project (individual)	1	1,500 words	10%	14 <sup>th</sup> week
Test	2	90 minutes	20%	5 <sup>th</sup> and 13 <sup>th</sup> week

### **Module Outcomes**

<p><b><u>Intended Learning Outcomes:</u></b></p> <ol style="list-style-type: none"> <li>1. Ability to Program rapidly using structured programming C++ concepts</li> <li>2. Display theoretical knowledge of both structured programming and Object Oriented C++ concepts</li> <li>3. discuss standard coding conventions --- indentation, naming conventions, etc.</li> <li>4. Make balanced programming and policy decisions</li> <li>5. Ability to discuss, accurately, basic design issues</li> </ol>	→	<p><b><u>Teaching and Learning Strategy:</u></b></p> <p>(ILO:1-5)</p> <ol style="list-style-type: none"> <li>1. Lectures and practical session in the lab</li> <li>2. Lectures and tutorials are going to be delivered containing the material from the module outline</li> <li>3. Regular presentation of solutions with peer feedback and discussion are encouraged both during lecture time and especially during lab time</li> <li>4. Lectures, tutorials and practical session assignments</li> </ol>
	→	<p><b><u>Assessment Strategy</u></b></p> <ol style="list-style-type: none"> <li>1. Mid-term exam (ILO:1-3)</li> <li>2. Final exam (ILO:1-5)</li> <li>3. Test (ILO:2)</li> <li>4. Project (ILO:1-5)</li> </ol>
<p><b><u>Practical Skills</u></b></p> <ol style="list-style-type: none"> <li>1. Practical programming in C++</li> <li>2. Ability to design basic algorithms for solving real problems</li> <li>3. Ability to design projects in an object-oriented language in a teamwork environment</li> <li>4. Ability to intelligently present technical solutions in both written and verbal formats</li> <li>5. Ability to organize a good technical presentation</li> </ol>	→	<p><b><u>Teaching and Learning Strategy:</u></b></p> <ol style="list-style-type: none"> <li>1. Lab exercises with tutor-lead support (PS:1-5)</li> <li>2. Individual project assignment (PS:1-5)</li> <li>3. Use of tests to test student subject knowledge (PS: 1-5)</li> </ol>
	→	<p><b><u>Assessment Strategy</u></b></p> <ol style="list-style-type: none"> <li>1. Final Exam (PS:1,2)</li> <li>2. Mid-term exam (PS: 1)</li> <li>3. Project (PS:1-5)</li> <li>4. Test (PS:4)</li> </ol>
<p><b><u>Transferable Skills</u></b></p> <ol style="list-style-type: none"> <li>1. Presentation skills</li> <li>2. Communication skills</li> <li>3. IT skills</li> <li>4. Planning and time management skills</li> </ol>	→	<p><b><u>Teaching and Learning Strategy:</u></b></p> <ol style="list-style-type: none"> <li>1. Lab exercises with tutor-lead support (TS:2-4)</li> <li>2. Individual project assignment (TS:1-4)</li> </ol>
	→	<p><b><u>Assessment Strategy</u></b></p> <ol style="list-style-type: none"> <li>1. Final Exam (TS: 3,4)</li> <li>2. Mid-term exam (TS:3,4)</li> <li>3. Project (TS:1-4)</li> <li>4. Test (TS:4)</li> </ol>

### **Key Texts and/or other learning materials**

**Set Text**

- Y. Daniel Liang, (2013), "*Introduction to Programming with C++*", 3<sup>rd</sup> edition, Pearson Education

**Supplementary Materials**

- Zak, D., (2015), *An Introduction to Programming with C++*, Cengage Learning
- Elsevier, (2015), *Science of Computer Programming*, Open Archive [online], <http://www.journals.elsevier.com/science-of-computer-programming/open-archive/> (Accessed 6<sup>th</sup> June 2016).

**Please note:** This specification provides a concise summary of the main features of the module and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. More detailed information on the learning outcomes, content and teaching, learning and assessment methods of each module and programme can be found in the departmental or programme handbook. The accuracy of the information contained in this document is reviewed annually by the University of Buckingham and may be checked by the Quality Assurance Agency.

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