UNDERGRADUATE COURSE FOR 2017-2018

Full Year

Course	Course Code (New)	Module Code (Old)	Level
Software Engineering Group Project	COMP2019	G52GRP	2
Algorithms Correctness and Efficiency	COMP2038	G52ACE	2
Development Experience	COMP3043	G53DEV	3
Industrial Experience	COMP3044	G53IND	3
Schools Experience	COMP3047	G53SCE	3
Individual Dissertation	COMP3025	G53IDS	3

Autumn Semester – Computer Science Courses

Course	Course Code (New)	Module Code (Old)	Level
Computer Fundamentals	COMP1027	G51CSF	1
Mathematics for Computer Scientists	COMP1017	G51MCS	1
Programming and Algorithms	COMP1028	G51PGA	1
Systems and Architecture	COMP1030	G51SYS	1
Software Maintenance	COMP2042	G52SWM	2
Operating Systems and Concurrency	COMP2035	G52OSC	2
Professional Ethics in Computing	COMP3041	G53PEC	3
Software Quality Assurance	COMP3033	G53SQM	3
Compilers	COMP3032	G53CMP	3
Machine Learning	COMP3038	G53MLE	3
Mobile Device Programming	COMP3040	G53MDP	3

Spring Semester – Computer Science Courses

Course	Course Code (New)	Module Code (Old)	Level
Programming Paradigms	COMP1029	G51PGP	1
Databases and Interfaces	COMP1031	G51DBI	1
Software Engineering	COMP1023	G51FSE	1
Fundamentals of Artificial Intelligence	COMP1032	G51FAI	1
Artificial Intelligence Methods (20cr)	COMP2024	G52AMI	2
Artificial Intelligence Methods (10cr)	COMP2039	G52AIM	2
Languages and Computation	COMP2040	G52LAC	2
C++ Programming	COMP2034	G52CPP	2
Introduction to Human Computer Interaction	COMP2025	G52HCI	2
Introduction to Image Processing	COMP2032	G52IIP	2
Software Specification	COMP2041	G52SOF	2
Computer Security	COMP3028	G53SEC	3
Computer Vision	COMP3029	G53VIS	3
Parallel and Distributed Computing	COMP3046	G53PDC	3
Fundamentals of Information Visualisation	COMP3042	G53FIV	3
Information Visualisation Project	COMP3045	G53IVP	3

Notes:

1. Courses offered in any semester are subjected to change as they depend on staff availability and sufficient number of student's enrolments.

2. The descriptions of the offered courses are current as and when this document is prepared but they may be subjected to modifications or additions by the course convenors.

3. Students may take courses offered by other Schools provided appropriate approval has been obtained from the Course Director of the School of Computer Science and the course convenor of the offering School, subjected to the condition that there is no clash in the timetables and that all prerequisites and corequisites of the selected course are met. A maximum of 20 credits of such courses are allowed in each academic year.

4. This document provides summaries as well as important details of Computer Science courses that are only relevant to the Malaysia Campus. Other information not included in this document e.g. education aims, learning outcomes as well as descriptions of other non-Computer Science courses, can be viewed at the Nottingham's Module Catalogue web site below:

   http://modulecatalogue.nottingham.ac.uk/Malaysia/ // Malaysia Campus
   http://modulecatalogue.nottingham.ac.uk/Nottingham/ // UK Campus

   Please note that some information in the module catalogue for Malaysia Campus may not be accurate any more due to change of system.

5. Course notes, lecture handouts, laboratory instructions, coursework and their submission procedure are available in:

   https://moodle.nottingham.ac.uk/login/index.php

G52GRP (COMP2019) – Software Engineering Group Project (20 Credits) – Full Year 2017-2018

1. Pre-requisites (P) & Co-requisites (C); Assessment Details (A)

P: None; C: G52SWM (COMP2042); A: Coursework 100%

2. *Lecturer*

Chen ZhiYuan (Dr)
Contact: 03-89248141 (Office Phone); BB71 (Room)
E-mail: Zhiyuan.Chen@nottingham.edu.my

3. Summary of Content

Working in groups of around five to six people, you'll be assigned a supervisor who will provide you with a short written description of a computer application to be designed, programmed, and documented during the course of the module. Each group will meet regularly with and without its supervisor; you'll also have several introductory one hour lectures.

4. Weekly Programme

Week No	Lecture Topic
1	**Introduction**
2	**Team Working and Group Meetings**
3	**Characteristics of a good project**
4	**Version Control**
5	**Understanding how to reference and cite your literature using bibliography manager(s)**
6	**Project and Timeline Checks**
7	**Giving an Effective Public Presentation**
8	**Testing & Software Quality**
9	**Report Writing**
10	
11	
12	

5. Resources

Reference texts as relevant to the project topics.

COMP2038 (G52ACE) – Algorithms Correctness and Efficiency (20 Credits) – Full Year 2017/18

1. Pre-requisites (P) & Co-requisites (C); Assessment Details (A)

P: None; C: None; A: Exam 2 (May/June 2018) 50%; Coursework 1 25%, Exam 1 (Jan 2018) 25%

2. Lecturer

Chew Sze-Ker (Mr)
New staff (TBA)
Contact: 03-89248140 (Office Phone), BB59 (Room)
E-mail: Chew.Sze-Ker@nottingham.edu.my

3. Summary of Content

This module covers important aspects of algorithms, namely their correctness and efficiency. To address correctness, we use a mathematically rigorous approach to formal verification using an interactive proof system. You'll study topics such as: proofs in propositional logic and predicate logic; classical vs. intuitionistic reasoning; basic operations on types; verification of list based programs; and introduction to program specification and program correctness. To address the issue of efficiency we cover the use of mathematical descriptions of the computational resources needed to support algorithm design decisions. You'll study topics such as: sorting algorithms, heaps, binary search trees, hash maps, and graph algorithms. The emphasis is upon understanding data structures and algorithms so as to be able to design and select them appropriately for solving a given problem.

4. Weekly Programme

Lecture No	Lecture Topic (Provisional)
1	Introduction
2&3	Recursion relations, induction, and runtime analysis
4&5	Abstract data types and big-O analysis
6&7	Sorting algorithms and big-O analysis
8,9&10	Tree data structure
11&12	Graph Algorithms **Coursework 1 due**
13&14	String algorithms and string matching
15&16	Propositional and first order logic
17&18	Algorithm correctness
19&20	Advanced data structures including Hashing
21	Revision **Coursework 2 due**

5. Resources

No	Name of Author(s)	Year of Publication	Title of Book	Edition	Publisher	ISBN
1	Mark Allen Weiss	2012	Data Structures and Algorithm Analysis in Java	3rd	Pearson	978-0-273-75211-0
2	Robert Sedgewick	2003	Algorithms in Java Part 1-4/Part 5	3rd	Addison Wesley	0201361205/ 0201361213

COMP3043 (G53DEV) – Development Experience (10 Credits) – Full Year 2017/18

1. Pre-requisites (P) & Co-requisites (C); Assessment Details (A)
P: None; C: None; A: Coursework 100%

2. Lecturer
Michael Chung (Mr)
Contact: 03-89248142 (Office Phone); BB58 (Room)
E-mail: michael.chung@nottingham.edu.my

3. Summary of Content
Students taking part in activities relating to Programming experience such as developing apps in their spare time, contributing to open source projects, or building things in hackathons may receive academic credit for showing they have experience and are an excellent developer. The emphasis of this experience module, is that you provide evidence of your significant extra-curricular software development experience. Students will only be able to register for this module with the approval of the convenor/School, once the material for assessment has been checked.

4. Weekly Programme
Not Applicable

5. Resources
Please see convenor(s) for advice.

COMP3044 (G53IND) – Industrial Experience (10 Credits) – Full Year 2017/18

1. Pre-requisites (P) & Co-requisites (C); Assessment Details (A)

P: None; C: None; A: Coursework 100%

2. Lecturer

Chen ZhiYuan (Dr)
Contact: 03-89248141 (Office Phone); BB71 (Room)
E-mail: Zhiyuan.Chen@nottingham.edu.my

3. Summary of Content

Students taking part in activities relating to industrial experience in a Computer Science or Software Engineering enterprise may obtain academic credit for them. Activities will be related to demonstration of involvement in development of complex software in a team situation, subject to quality control procedures of an industrial or business practice. Evidence of working to and completing tasks relating to targets set by an employer and directly related to software development/programming will be required. Students will have undertaken an agreed number of hours on the activities, identified personal goals and targets in relation to these activities and maintained a reflective portfolio as a record of evidence of their competence and achievements. The nature of the activities undertaken will be subject to the approval of the module convenor before acceptance on the module.

4. Weekly Programme

Lecture No	Lecture Topic
1	Preliminary Portfolio
2	Enrol on the module
3	Submit a final portfolio
4	
5	
6	
7	
8	

5. Resources

1	G53IND - Coursework Issue Sheet	Moodle
2	G53IND Guidance File	Moodle

COMP3047 (G53SCE) – Schools Experience (10 Credits) – Full Year 2017/18

1. Pre-requisites (P) & Co-requisites (C); Assessment Details (A)

P: None; C: None; A: Coursework 100%

2. Lecturer

Iman Yi Liao (Dr)
Contact: 03-87253438 (Office), BB63 (Room)
E-mail: Iman.Liao@nottingham.edu.my

3. Summary of Content

Students taking part in activities relating to Computing in Schools may obtain academic credit for them. Students taking part in approved activities, such as running code clubs in schools, organising school computing activity days, or becoming active STEM ambassadors may receive academic credit for demonstrating they have actively contributed. Students will have undertaken an agreed number of hours on the activities, identified personal goals and targets in relation to these activities and maintained a reflective portfolio as a record of evidence of their competence and achievements. Students will only be able to register for this module with the approval of the convenor/School, once the material for assessment has been discussed.

4. Weekly Programme

Not applicable

5. Resources

Please see convenor(s) for advice.

COMP3025 (G53IDS) – Individual Dissertation (40 Credits) – Full Year 2017/18

1. Pre-requisites (P) & Co-requisites (C); Assessment Details (A)

P: None; C: None; A: Dissertation 75%, Practical (Demo) 15%, Interim Report (Autumn) 10%

2. Lecturer

KR Selvaraj (Mr)
Contact: 03-89248139 (Office Phone); BB60 (Room)
E-mail: kr.selvaraj@nottingham.edu.my

3. Summary of Content

Students are required to perform an individual project on a topic in computer science. Each student has a supervisor who is a member of the academic staff. The topic can be any area of the subject which is of mutual interest to both the student and supervisor. Through a one hour lecture and a tutorial with your supervisor each week, you'll develop your own independent research project and written report. Topics can range from purely theoretical studies to practical work building a system for some third party, although most projects aim to provide a balance between the theoretical and practical aspects of the subject. Guidelines on word length of dissertation are flexible to accommodate differing types of project work (e.g. balance between theory and practice) undertaken.

4. Weekly Programme

Week No	Lecture Topic
1	Project Planning
2	Information Skills
3	Literature Review
4	Plagiarism
5	Research Methodology
6	Dissertation Report Preparation
7	Software Demonstration Process
8	TBA
9	TBA

5. Resources

No	Name of Author(s)	Year of Publication	Title of Book	Edition	Publisher	ISBN
1	Dawson, Christian W	2000	The essence of computing projects: a student's guide		Prentice Hall	

Reference texts recommended by the supervisors as relevant to the project topics.

COMP1027 (G51CSF) – Computer Fundamentals (10 Credits) – Autumn 2017/18

1. Pre-requisites & Co-requisites; Assessment Details

P: None; C: G51PGA; A: Coursework 1 30%, Coursework 2 20%, 1-hour Written Examination 50%

2. Lecturer

Amr Ahmed (Dr)
Contact: 03-89248145 (Office Phone); BB65 (Room)
E-mail: Amr.Ahmed@nottingham.edu.my

3. Summary of Content

This module gives a basic understanding of the fundamental architecture of computers and computer networks. This module will introduce how the simple building blocks of digital logic can be put together in different ways to build an entire computer. It will also show how modern computer systems and networks are constructed of hierarchical layers of functionality which build on and abstract the layers below.

4. Weekly Programme (subject to revisions and changes by delivery team**)**

Week No	Lecture Topic
1	Introduction, overview and module contents
2	Boolean Logic
3	Boolean Arithmetic
4	Sequential Logic and Machine Language
5	Computer Architecture
6	Assembler
7	Introduction to Networks
8	Virtual Machine I: Stack Arithmetic
9	virtual machine II: Program Control
10	High Level Language
11	Assignment Support
12	Revision & Exam training

5. Resources

No	Name of Author(s)	Year of Publication	Title of Book (Primary)	Edition	Publisher	ISBN
1	N. Nisan & S. Schocken	2005	The Elements of Computing Systems: Building a Modern Computer from First Principles		The MIT Press	0-262-64068-6

COMP1017 (G51MCS) – Mathematics for Computer Scientists (10 Credits) – Autumn 2017/18

1. Pre-requisites & Co-requisites; Assessment Details

P: None; C: None; A: Coursework 25%; 1.5-hour Written Examination 75%

2. Lecturer

Iman Yi Liao (Dr)
Contact: 03-87253438 (Office), BB63 (Room)
E-mail: Iman.Liao@nottingham.edu.my

3. Summary of Content

You'll cover the basic concepts in mathematics which are of relevance to the development of computer software. Topics which will be covered include: boolean algebra; simple number theory; sets, functions and relations; sum and product; and simple induction on natural numbers. You'll spend around three hours per week in lectures and tutorials for this module

4. Weekly Programme

Week No	Lecture Topic
1	Introduction
2	Boolean algebra (1)
3	Boolean algebra (2)
4	Sets
5	Functions
6	Number theories
7	Matrices
8	Induction
9	Counting techniques (1)
10	Counting techniques (2)
11	Relations
12	Revision

5. Resources

No	Name of Author(s)	Year of Publication	Title of Book (Primary)	Edition	Publisher	ISBN
1	Kenneth H. Rosen	2007	Discrete Mathematics and Its Applications	6th	McGraw-Hill	0-007-124474-3

COMP1028 (G51PGA) – Programming and Algorithms (20 Credits) – Autumn 2017/18

1. Pre-requisites (P) & Co-requisites (C); Assessment Details (A)

P: None; C: G51CSA; A: Coursework 75%, 1 hour Written Examination 25%

2. Lecturer

Chew Sze-Ker (Mr)
Contact: 03-89248140 (Office Phone); BB59 (Room)
E-mail: chew.sze-ker@nottingham.edu.my

3. Summary of Content

You'll cover the basic concepts of programming including: problem solving; debugging; elementary programming; functions and procedures; memory and pointers; and data structures. You'll spend around six hours per week in lectures, computer classes and tutorials. The basic concepts of programming including: problem solving, compiling, editing, debugging, elementary programming, conditionals, loops, functions and procedures, arrays and strings, direct and indirect access, memory and pointers, iteration and recursion and data structures.

Please note: This is a non-compensatable module.

4. Weekly Programme

Week No	Lecture Topic
1	Introduction to C compiler/Getting started with GCC
2	Procedures, Parameters, Values and Variables
3	Operators and Precedence, Conditionals and Loops
4	Pointers and scanf()
5	Arrays and Strings, Linked List, Structures
6	Introduction to Algorithms, Big O Notation
7	String Processing
8	File Input/Output
9	Data Structures (Tree, heaps)
10	Data Structures (Sorting)

5. Resources

No	Name of Author(s)	Year of Publication	Title of Book	Edition	Publisher	ISBN
1	Kernighan, Brian W., Dennis M. Ritchie	1988	The C programming language	2nd	Prentice Hall	0-131-10362-8
2.	Thomas H. Cormen et al.	2009	Introduction to Algorithms	3rd	MIT Press	0-262-03384-4

COMP1030 (G51SYS) – Systems and Architecture (20 Credits) – Autumn 2017/18

1. Pre-requisites (P) & Co-requisites (C); Assessment Details (A)

P: None; C: G51CSF; A: Coursework 1 (50%), Exam 1: Written exam (25%), Exam 2: Online exam (25%).

2. Lecturer

KR Selvaraj (Mr)
Contact: 03-89248139 (Office Phone); BB60 (Room)
E-mail: kr.selvaraj@nottingham.edu.my

3. Summary of Content

This module builds upon the basic understanding of the fundamental architecture of computers and computer networks obtained in G51CSF, to show how it applies in real systems. It will cover the principles of the lower level implementation of I/O using polling and interrupts, and the use of exceptions and how the Operating System uses these to manage resources, particularly as computers become inherently more parallel. It will show how large networks such as the Internet are constructed. It will consider how non-numeric data is represented in computer systems. You will spend around five hours per week in tutorials, lectures and computer classes for this module.

4. Weekly Programme

Week No	Lecture Topic
1	Introduction and Networking
2	Local Area and Wide Area Networking
3	Routing and Forwarding in a network
4	Overview of Operating Systems and Operating System Principles
5	Digital logic and digital systems I
6	Digital logic and digital systems II
7	Machine level representation of data
8	Assembly level machine organization
9	Memory system organization and architecture
10	I/O and Interrupts
11	Parallel Decomposition, Communication and Coordination, Parallel Architecture
12	Revision

5. Resources

No	Name of Author(s)	Year	Title of Book	Ed	Publisher's Name	ISBN
1	Hohl, William	2009	ARM Assembly Language: Fundamentals and techniques		CRC	

COMP2042 (G52SWM) – Software Maintenance (20 Credits) – Autumn 2017/18

1. Pre-requisites (P) & Co-requisites (C); Assessment Details (A)

P: G51FSE; C: None; A: Coursework 1 25%, Coursework 2 25%, 1 hour Written Examination 50%

2. Lecturer

Behrang Parhizkar (Hani) (Mr)
Contact: 017 330 1824 (Mobile), BB47 (Room)
E-mail: Hani.Parhizkar@nottingham.edu.my

3. Summary of Content

This module builds on your basic Java programming and software engineering skills developed in Year 1, extending it to working with larger third party software systems, and the challenges associated with this. Topic examples include: design diagrams and modelling; GUI programming; testing software engineering methodologies (including agile development and tools), all in the context of understanding and refactoring third-party code. You will spend around two hours per week in lectures, two hours per week in computer classes, and one hour per week in workshops studying for this module.

4. Weekly Programme

Week No	Lecture Topic
1	Introduction, overview and module contents
2	Overview of Software Engineering
3	Object Oriented Analysis and Design
4	Object Oriented UML
5	Software Implementation
6	Software testing
7	Unit Test, Integration Test, Usability Test
8	Software Maintenance and Different Type of Software Maintenance
9	Software Maintenance metrics and case studies
10	Software GUI
11	Revision

5. Resources

No	Name of Author(s)	Year of Publication	Title of Book	Edition	Publisher	ISBN
1	David Parsons	2012	Fundamental Java: Key Elements and Practical Programming	3rd	Springer	9781447124788
2	Alain April	2012	Software Maintenance Management	6th	Wiley Intersience	978-0470-14707-8

COMP2035 (G52OSC) – Operating Systems and Concurrency (20 Credits) – Autumn 2017/18

1. Pre-requisites (P) & Co-requisites (C); Assessment Details (A)
P: Knowledge of programming/OOP, C: None; A: CW 25% & Final Exam 75%

2. Lecturer
KR Selvaraj (Mr)
Contact: 03-89248139 (Office Phone); BB60 (Room)
E-mail: kr.selvaraj@nottingham.edu.my

3. Summary of Content:
This course covers the fundamental principles that underpin operating systems and concurrency. Topics in operating systems that are covered include the architecture of operating systems, process and memory management, storage, I/O, and virtualisation. The principles of concurrency will be introduced from both the perspective of an operating system and user applications. Specific topics on concurrency include: hardware support for concurrency; mutual exclusion and condition synchronisation; monitors; safety and liveness properties of concurrent algorithms, and the use of threads and synchronisation.

4. Weekly Programme

Week No	Lecture Topics
1	Introduction and background, Operating Systems Structures
2	Memory Management Part I
3	Memory Management Part II
4	Processes Scheduling Part I
5	Processes Scheduling Part II
6	Concurrency & OS, Concurrent Programming, Threads
7	Critical Section, Hardware support for concurrency, Mutual Exclusion
8	Deadlock, Semaphores, Monitors
9	Properties of Concurrent Algorithms, Java and Concurrency
10	File Systems
11	Input/output Processes
12	Revision

5. Resources

No	Name of Author(s)	Year of Publication	Title of Book	Edition	Publisher's Name	ISBN
1	Andrew S. Tanenbaum	2009	Modern Operating Systems	3rd	Pearson Prentice Hall	
2	M.Ben-Ari	2006	Principles of Concurrent Programming	2nd	Addison -Wesley	

COMP3041 (G53PEC) – Professional Ethics in Computing (10 Credits) – Autumn 2017/18

1. Pre-requisites (P) & Co-requisites (C); Assessment Details (A)

P: None; C: None; A: 1 Hour Written Examination – 50%; Coursework – 50%

2. Lecturer

Chen Zhiyuan (Dr) [Co-ordinator for Group Teaching]
Contact No: 03-89248141 (Office Phone); BB71 (Room)
E-mail: Zhiyuan.Chen@nottingham.edu.my

3. Summary of Content

The module looks broadly into professional ethics within the scope of the computing discipline. It covers a range of professional, ethical, social and legal issues in order to study the impact that computer systems have in society and the implications of this from the perspective of the computing profession. In particular, the module covers topics such as introduction to ethics, critical thinking, professionalism, privacy, intellectual and intangible property, cyber-behaviour, safety, reliability accountability, all these within the context of computer systems development.

4. Weekly Programme

Week No	Lecture Topic
1	Introduction
2	Ethics Theories
3	Professionalism
4	Critical Thinking
5	Privacy
6	Intellectual Property Issues
7	Poster
8	Cyber Behaviour
9	Safety & Reliability
10	Accountability
11	

5. Resources

No	Name of Author(s)	Year of Publication	Title of Book	Edition	Publisher	ISBN
1	Sarah Baase	2008	A gift of fire	3rd	Prentice Hall	0-13-600848-4
2	K. Bowyer	2001	Ethics & Computing	1st	Wiley-IEEE Press	0-7803-6019-2

COMP3033 (G53SQM) – Software Quality Assurance (10 Credits) – Autumn 2017/18

1. Pre-requisites (P) & Co-requisites (C); Assessment Details (A)
P: None; C: None; A: Coursework 40%, 1.5 Hour Written Examination 60%

2. Lecturer
Amr Ahmed (Dr)
Contact: 03-89248145 (Office Phone); BB65 (Room)
E-mail: Amr.Ahmed@nottingham.edu.my

3. Summary of Content
Through a two hour lecture each week, you'll be introduced to concepts and techniques for software testing and will be given an insight into the use of artificial and computational intelligence for automated software testing. You'll also review recent industry trends on software quality assurance and testing.

4. Weekly Programme (subject to revisions and changes)

Week No	Lecture Topic
1	Introduction
2	Software Quality Assurance, Management and Control
3	How to assess Quality
4-6	Software Quality Metrics (Product, Process, Project)
7	Data Collection, Analysis and Validation
8-9	Software Testing – strategies & concepts
10	Automated Testing (Tools include: Junit, Git,….etc.)
11	Quality Management & Emerging trends
12	Revision

5. Resources

No	Name of Author(s)	Year of Publication	Title of Book	Edition	Publisher	ISBN
1	Daniel Galin	2004	Software Quality Assurance: From Theory to Implementation		Pearson	9780201709452
	Stephen H. Kan	2003	Metrics and Models in Software Quality	2nd	Addison-Wesley	0201729156
3	Roger Pressman	2010	Software Engineering: A Practitioner's Approach	7th	McGraw-Hill	0073375977

COMP3032 (G53CMP) – Compilers (10 Credits) – Autumn 2017/18

1. Pre-requisites (P) & Co-requisites (C);Assessment Details (A)

P: G51FUN, G52MAL; C: None; A: Coursework 25%, Written Examination 75%

2. Lecturer

Tomas Maul (Dr)
Contact: 03-89248232 (Office Phone); BB64 (Room)
E-mail: Tomas.Maul@nottingham.edu.my

3. Summary of Content

You'll examine aspects of language and compiler design by looking at the techniques and tools that are used to construct compilers for high level programming languages. Topics covered include: parsing; types and type systems; run-time organisation; memory management; code generation; and optimisation. You'll spend around four hours each week in lectures and computer classes for this module.

4. Weekly Programme

Week No	Lecture Topic
1	Administrative Details and Introduction
2	Overview & Lexical Analysis
3	Syntax Analysis 1
4	Syntax Analysis 2
5	Semantic Analysis
6	Intermediate Code Generation 1
7	Intermediate Code Generation 2
8	Run-Time Organisation
9	Code Generation
10	Code Optimisation
11	Revision

5. Resources

No	Name of Author(s)	Year of Publication	Title of Book	Edition	Publisher's Name	ISBN
1	Aho, Lam, Sethi and Ullman	2003	Compilers: Principles, Techniques & Tools	2nd	Prentice Hall	0-201-10194-7

COMP3038 (G53MLE) – Machine Learning (20 Credits) – Autumn 2017/18

1. Pre-requisites & Co-requisites; Assessment Details

P: G51PGA (COMP1028), G51MCS (COMP1017) or equivalent; C: None; A: 2 Hour Written Examination – 70%; Coursework – 30%

2. Lecturer

Chen ZhiYuan (Dr)
Contact: 03-89248141 (Office); BB71 (Room)
E-mail: Zhiyuan.Chen@nottingham.edu.my

Iman Yi Liao (Dr)
Contact: 03-87253438 (Office Phone); BB63 (Room)
E-mail: Iman.Liao@nottingham.edu.my

3. Summary of Content

Providing you with an introduction to machine learning, pattern recognition, and data mining techniques, this module will enable you to consider both systems which are able to develop their own rules from trial-and-error experience to solve problems, as well as systems that find patterns in data without any supervision. In the latter case, data mining techniques will make generation of new knowledge possible, including very big data sets. This is now fashionably termed 'big data' science. You'll cover a range of topics including: machine learning foundations; pattern recognition foundations; artificial neural networks; deep learning; applications of machine learning; data mining techniques and evaluating hypotheses.

4. Weekly Programme

Week No	Lecture Topic
1	Machine Learning Preliminaries
2	Classification
3	Clustering
4	Regression and Association Rules
5	Anomaly Detection
6	Introduction to Data Preprocessing and Data Quantification
7	Preprocessing-discretisation, missing value
8	Feature and prototype selection, Dimensionality Reduction
9	Image Processing
10	Text Mining
11	Deep Learning & 'Big Data'

5. Resources

No	Name of Author(s)	Year of Publication	Title of Book (Primary)	Edition	Publisher's Name	ISBN
1	Tom M. Mitchell	1997	Machine Learning		McGraw-Hill	0070428077
2	Chris Bishop	2006	Pattern Recognition and Machine Learning		Springer	0387310738

COMP3040 (G53MDP) – Mobile Device Programming (20 Credits) – Autumn 2017/18

1. Pre-requisites (P) & Co-requisites (C);Assessment Details (A)

P: G51CSA, G51PRG, G51ISO (2014-15); C: None; A: Coursework 1 – 30%, Coursework 2 – 40%, 1 hour written examination – 30%

2. Lecturer

Michael Chung (Mr)
Contact: 03-89248142 (Office Phone); BB58 (Room)
E-mail: michael.chung@nottingham.edu.my

3. Summary of Content

You'll look at the development of software applications for mobile devices, with a practical focus on the Android operating system. You'll consider and use the software development environments for currently available platforms and the typical hardware architecture of mobile devices. You'll spend around three hours per week in lectures and computer classes for this module.

4. Weekly Programme

Week No	Lecture Topic
1	Introduction
2	Mobile Phone Architecture/Android Internals
3	Android Application Components – Activities
4-5	Thread and Services
6	IPC and Storage
7	Databases, Content Providers and Permissions
8-9	Broadcasts, Touch, Gestures
10	Power and Batteries
11	iOS, Cross-platform
12	Revision

5. Resources

No	Name of Author(s)	Year of Publication	Title of Book	Edition	Publisher's Name	ISBN
1	TBA					

6. Pre-requisites (P) & Co-requisites (C); Assessment Details (A)

P: G51MCS, G51PGA; C: None; A: Coursework 1 – 10%, Coursework 2 – 15 %, 2.5 Hour Written Examination 75%

7. Lecturer

Michael Chung (Mr)
Contact: 03-89248142 (Office), BB58 (Room)
E-mail: michael.chung@nottingham.edu.my

New staff
Contact: TBA
Email:

8. Summary of Content

In this module you'll learn the basic principles of the object-oriented and functional approaches to programming, using the languages Java and Haskell. You'll also see how they can be used in practice to write different kinds of programs.

9. Weekly Programme

Week No	Lecture Topic
1	Introduction
2	From C to Java
3	Methods, classes and objects
4	Inheritance, Polymorphism, Interfaces and abstract classes
5	Strings, exception and files
6	Haskell Platform and Type Information
7	Defining functions, list comprehension
8	Recursive functions, higher-order functions
9	Interactive programs
10	Defining types and classes
11	Lazy evaluation
12	Revision

10. Resources

No	Name of Author(s)	Year of Publication	Title of Book	Edition	Publisher	ISBN
1	Graham Hutton	2007	Programming in Haskell	1st	CUP	0-521-69269-5
2	Judith Bishop	2001	Java Gently	3rd	Pearson	978-0201710502

COMP1031 (G51DBI) – Databases and Interfaces (20 Credits) – Spring 2017/18

1. Pre-requisites (P) & Co-requisites (C); Assessment Details (A)

P: G51MCS; C: None; A: Coursework 1-15%, Coursework 2-35%, 2-hour Written Examination 50%

2. Lecturer

Behrang Parhizkar (Hani) (Mr)
Contact: 017 330 1824 (Mobile), BB47 (Room)
E-mail: Hani.Parhizkar@nottingham.edu.my

3. Summary of Content

Databases are everywhere and we interact with many different databases every day, using the web, using electronic calendars, diaries or timetables, making appointments, searching for contact details, shopping online, looking up directions, and many more things. These databases need to be both easy to use and fast. This module considers both the structure of databases, including how to make them fast, efficient and reliable, and the appropriate user interfaces which will make them easy to interact with for users. You will start by looking at how to design a database, gaining an understanding of the standard features that management systems provide and how you can best utilise them and then develop an interactive application to access your database. Throughout the lectures and computing sessions you will learn how to design and implement systems using a standard database management system, web technologies and GUI interfaces through practical programming/system examples. You will spend around three hours per week in lectures and two hours per week in organised computer labs studying for this module, and will be expected to spend additional time practising and completing your coursework.

4. Weekly Programme

Week No	Topics
1	Introduction, overview and module contents
2	Introduction to Database Systems, The Relational Model
3	Database Models & Relational Database
4	Relational Algebra & Entity Relationship Modelling
5	Normalisation
6	SQL Data Definition
7	More SQL – Data Definition Language
8	Data Administration and Security
9	Object-relational & Object-oriented Databases, XML and databases
10	Good and Bad 'Modern' Databases
11	Revision

5. Resources

No	Name of Author(s)	Year of Publication	Title of Book	Edition	Publisher	ISBN
1	Clare Churcher	2012	Beginning Database Design	3rd	Apress	1430242108
2	Thomas Connolly and Carolyn Begg,	2005	Fundamentals of Database Systems	4th	Addison Wesley	0- 3212-0448- 4

COMP1023 (G51FSE) – Software Engineering (10 Credits) – Spring 2017/18

1. Pre-requisites (P) & Co-requisites (C); Assessment Details (A)

P: None; C: None; A: Coursework 50%; 1-hour written Exam 50%

2. Lecturer

Behrang Parhizkar (Hani) (Mr)
Contact: 017 330 1824 (Mobile), BB47 (Room)
E-mail: Hani.Parhizkar@nottingham.edu.my

3. Summary of Content

You'll be introduced to the concept of Software Engineering and will be taken through the software development process: deciding exactly what should be built (Requirements & Specification), designing how it should be built (Software Architecture), development strategies (Implementation & Testing), and maintaining change (Software Evolution and Maintenance).

4. Weekly Programme

Week No	Lecture Topic
1	Introduction, overview and module contents
2	Foundamental of Software Engineering
3	Software methodologies
4	From Requirements to Specifications
5	Effective Software Design
6	Software Implementation
7	Software Prototyping
8	Version Control
9	Software Debugging
10	Software Methodologies: Agile & XP
11	Test Driven Development

5. Resources

No	Name of Author(s)	Year of Publication	Title of Book	Edition	Publisher	ISBN
1	Ronald J. Leach	2016	Introduction to Software Engineering	2nd	CRC Press	978-1-4987-0528-8
2						

COMP1032 (G51FAI) – Fundamentals of Artificial Intelligence (10 Credits) – Spring 2017/18

1. Pre-requisites (P) & Co-requisites (C); Assessment Details (A)

P: None; C: None; A: Coursework - 25%; 1 hour Written Examination - 75%

2. Lecturer

Chong Siang Yew (Dr)
Contact: TBC
E-mail: TBC

3. Summary of Content

Through a two hour lecture once a week, this module gives you a broad overview of the fundamental theories and techniques of Artificial Intelligence (AI). You'll explore how computers can produce intelligent behaviour, and will consider topics such as the history of AI, search techniques, data mining, machine learning, game playing techniques, neural networks, philosophical issues, and knowledge representation and reasoning.

4. Weekly Programme

Week No	Lecture Topic
1	Introduction, overview and module contents
2	Reasons for AI; History of AI; Philosophy of AI
3	Problem formulation (Labs on search algorithms with Java)
4	Uninformed search – BFS, DFS, UCS, DLS, IDS (Labs – continued)
5	Heuristic search techniques – BFS, GFS and A* (Labs – continued)
6	Courseworks discussion – (Labs on machine learning with R)
7	Game playing techniques (Labs – continued)
8	Introduction to machine learning (Labs continued)
9	Neural networks (Labs continued)
10	Probabilistic reasoning & knowledge representations
11	Revision

5. Resources

No	Name of Author(s)	Year of Publication	Title of Book	Edition	Publisher	ISBN
1	S. J. Russell & Peter Norvig	2010	AI :A Modern Approach	3rd	Prentice Hall	0-13-604259-7
2	George F Luger	2008	AI:Structures and strategies for Complex Problem Solving	6th	Addison Wesley	0-321-54589-3

COMP2039 (G52AMI) – Artificial Intelligence Methods (10cr) (10 Credits) – Spring 2018/18

1. Pre-requisites (P) & Co-requisites (C); Assessment Details (A)

P: None; C: None; A: Coursework 0%, Written Examination 100%

2. Lecturer

Tomas Maul (Dr); Zhiyuan Chen (Dr)
Contact: 03-89248232 (Office), BB70 (Room); 03-89248141 (Office), BB71 (Room)
E-mail: Tomas.Maul@nottingham.edu.my; Zhiyuan.Chen@nottingham.edu.my

3. Summary of Content

This module builds on the first year Introduction to AI, which covers the ACM learning outcomes, and introduces new areas. The emphasis is on building on the AI research strengths in the School. As a Launchpad it gives brief introductions to topics including AI techniques, fuzzy logic and intelligent agents, and modern search techniques such as Genetic Algorithms, Tabu Search, Simulated Annealing, and Genetic Programming, etc.

4. Weekly Programme

Note: This preliminary/tentative outline is for general guidance, and is likely to change before the start of lectures.

Week No	Topics
1	Introduction to Artificial Intelligence Methods.
2	Components of Heuristics and Hill Climbing.
3	Metaheuristics.
4	Move Acceptance in Metaheuristics and Parameter Setting Issues.
5	Evolutionary Algorithms. Part I.
6	Evolutionary Algorithms. Part II.
7	Hyper-heuristics.
8	Learning from Observation.
9	Knowledge and Reasoning.
10	Modelling and Simulation.
11	Revision and exam guidance.

5. Resources

No	Name of Author(s)	Year of Publication	Title of Book	Edition	Publisher	ISBN
1	S. J. Russell & Peter Norvig	2010	AI :A Modern Approach	3rd	Prentice Hall	0-13-604259-7
2	George F Luger	2008	AI:Structures and strategies for Complex Problem Solving	6th	Addison Wesley	0-321-54589-3

COMP2024 (G52AIM) – Artificial Intelligence Methods (20cr) (20 Credits) – Spring 2017/18

1. Pre-requisites (P) & Co-requisites (C); Assessment Details (A)

P: Knowledge of programming (G51PGP or equivalent); C: None; A: Coursework 50%, Written Examination 50%

2. Lecturer

Tomas Maul (Dr); Zhiyuan Chen (Dr)
Contact: 03-89248232 (Office), BB70 (Room); 03-89248141 (Office), BB71 (Room)
E-mail: Tomas.Maul@nottingham.edu.my; Zhiyuan.Chen@nottingham.edu.my

3. Summary of Content

This module builds on the first year Introduction to AI, which covers the ACM learning outcomes, and introduces new areas. The emphasis is on building on the AI research strengths in the School. As a Launchpad it gives brief introductions to topics including AI techniques, fuzzy logic and intelligent agents, and modern search techniques such as Genetic Algorithms, Tabu Search, Simulated Annealing, and Genetic Programming, etc. In contrast to G52AMI, this module includes a significant proportion of practical work.

4. Weekly Programme

Note: This preliminary/tentative outline is for general guidance, and is likely to change before the start of lectures.

Week No	Topics
1	Introduction to Artificial Intelligence Methods.
2	Components of Heuristics and Hill Climbing.
3	Metaheuristics.
4	Move Acceptance in Metaheuristics and Parameter Setting Issues.
5	Evolutionary Algorithms. Part I.
6	Evolutionary Algorithms. Part II.
7	Hyper-heuristics.
8	Learning from Observation.
9	Knowledge and Reasoning.
10	Modelling and Simulation.
11	Revision and exam guidance.

5. Resources

No	Name of Author(s)	Year of Publication	Title of Book	Edition	Publisher	ISBN
1	S. J. Russell & Peter Norvig	2010	AI :A Modern Approach	3rd	Prentice Hall	0-13-604259-7
2	George F Luger	2008	AI:Structures and strategies for Complex Problem Solving	6th	Addison Wesley	0-321-54589-3

COMP2040 (G52LAC) – Languages and Computation (10 Credits) – Spring 2017/18

1. Pre-requisites (P) & Co-requisites (C); Assessment Details (A)

P: None; C: None; A: Coursework 25%, Written Examination 75%

2. Lecturer

Tomas Maul (Dr)
Contact: 03-89248232 (Office Phone); BB70 (Room)
E-mail: Tomas.Maul@nottingham.edu.my

3. Summary of Content

You'll investigate classes of formal language and the practical uses of this theory, applying this to a series of abstract machines. You'll focus in particular on language recognition, but will study a range of topics including: finite state machines; regular expressions; context-free grammars; and Turing machines and computability theory. You'll spend around two hours per week in lectures studying for this module.

4. Weekly Programme

Week No	Lecture Topic
1	Introduction, overview and module contents
2	Alphabets, words and languages.
3	Automata Theory; Deterministic and Non-deterministic Finite Automata (DFAs and NFAs).
4	NFA & DFA equivalence and other matters.
5	Regular Expressions.
6	DFA Minimization and Proving Languages to be Not Regular.
7	Pushdown Automata (PDA).
8	Context-free Grammars (CFG).
9	Context-sensitive grammars, Turing machines and Decidability.
10	More Turing Machines.
11	Computability Theory.

5. Resources

No	Name of Author(s)	Year of Publication	Title of Book	Edition	Publisher's Name	ISBN
1	John Hop Croft, Rajeev Motwani, Jeffrey.D.Ullman	2007	Introduction to Automata Theory, Languages and computation	3rd	Addison Wesley	0-3214-7617-4

COMP2034 (G52CPP) – C++ Programming (10 Credits) – Spring 2017/18

1. Pre-requisites (P) & Co-requisites (C); Assessment Details (A)

Knowledge of C (e.g. from G51PGA) and of object oriented Java programming (e.g. from G51PGP).; C: None; A: Exam - 60%, Coursework - 40%

2. Lecturer

Chew Sze-ker (Mr)
Contact: 03-89248140 (Office), BB59 (Room)
E-mail: chew.sze-ker@nottingham.edu.my

3. Summary of Content

You will cover the programming material and concepts necessary to obtain an understanding of the C++ programming language. You will spend around four hours per week in lectures and computer classes for this module and will be expected to take additional time to practice and to produce your coursework. The tutorial is held in a lecture room and is a practical session to ask questions, get feedback, practise what you have learned and see examples.

4. Weekly Programme (tentative)

Week No	Lecture Topic
1	Introduction
2&3	Pointers, Functions, The stack, Local, global and static variables, Variable shadowing
4	Structs and unions, Dynamic memory allocation, Linked lists
5	The C pre-processor, Linkage and visibility, Class-preliminary
6&7	The this pointer, new and delete, Inheritance, Virtual functions
8&9	Function pointers, Overridden function, Virtual, non-virtual , and Pure virtual functions, various forms of constructors
10&11	File organization, C++ Templates, C++ Exceptions, STL, Vectors, Lists, Algorithms, and dynamic memory
12	Revision

5. Resources

No	Name of Author(s)	Year of Publication	Title of Book	Edition	Publisher	ISBN
1	Herbert Schildt	2003	C++: the complete reference	4th	McGraw-Hill	0072226803
2	Bjarne Stroustrup	2013	The C++ programming language	4th	Addison-Wesley	9780321563842
3	Scott Meyers	2003	Effective C++: 50 specific ways to improve your programs and designs	2nd	Addison-Wesley	0201924889

COMP2035 (G52HCI) – Introduction to Human Computer Interaction (10 Credits) – Spring 2017/18

1. Pre-requisites (P) & Co-requisites (C); Assessment Details (A)

P: None; C: None; A: Coursework 1 – 50%, Coursework 2 – 50%

2. Lecturer

Marina Ng (Dr)
Contact: 03-89253412 (Office); BB71 (Room)
E-mail: marina.ng@nottingham.edu.my

3. Summary of Content

This module is part of the Human-Computer Interaction theme in the School of Computer Science.

The module provides an overview of the field of Human Computer Interaction, which aims to understand people's interaction with technology and to apply this knowledge in the design of usable interactive computer systems. The module will introduce the concept of usability, examine different design approaches and evaluation methods and illustrate the principles through an exploration of a number of case studies.

4. Weekly Programme

Week No	Lecture Topic
1	Introduction, overview and module contents
2	Understanding Users – The Cognitive Perspective
3	Understanding Users - Ethnography
4	Gathering requirements
5	Designing GUIs
6	Participatory design and prototyping
7	Mobile and ubiquitous computing
8	Communication and collaboration
9	Evaluating Interfaces
10	The future of the Interface
11	Panel evaluation
12	Revision

5. Resources

No	Name of Author(s)	Year of Publication	Title of Book	Edition	Publisher	ISBN
1	Helen Sharp, Yvonne Rogers & Jenny Preece	2007	Interaction Design: Beyond Human Computer Interaction	2nd	Wiley	0-4700-1866-6
2	Ben Schneiderman & Catherine Plaisan	2010	Designing the User Interface: Strategies for Effective Human-Computer Interaction	5th	Addison-Wesley	0-3215-3735-1

COMP2032 (G52IIP) – Introduction to Image Processing (10 Credits) – Spring 2017/18

1. Pre-requisites (P) & Co-requisites (C); Assessment Details (A)

P: G51PGA or equivalent programming experience and knowledge of mathematics; C: None; A: Coursework - 40%, Written Examination - 60%

2. Lecturer

Amr Ahmed (Dr)
Contact: 03-89248145 (Office Phone); BB65 (Room)
E-mail: Amr.Ahmed@nottingham.edu.my

3. Summary of Content

This module introduces the field of digital image processing, a fundamental component of digital photography, television, computer graphics and computer vision. You'll cover topics including: image processing and its applications; fundamentals of digital images; digital image processing theory and practice; and applications of image processing. You'll spend around three hours in lectures and computer classes each week for this module.

4. Weekly Programme (tentative)

Week No	Lecture Topic
1	Introduction, overview and module contents
2	Digital image fundamentals
3	Point and histogram processing
4	Spatial domain image filtering
5	Image sharpening, edge detection and Hough transform
6	Frequency domain & Fourier transform
7	Image filtering in the frequency domain
8	Image segmentation & representation
9	Object representation
10	Image coding and image compression
11	Selected applications of image processing.

5. Resources

No	Name of Author(s)	Year of Publication	Title of Book	Edition	Publisher	ISBN
1	Gonzalez & Woods	2008	Digital Image Processing	3rd	Prentice Hall	0-13-168728-X
2	Efford	2000	Digital Image Processing Using Java	1st	Addison-Wesley	0-20-159623-7

COMP2041 (G52SOF) – Software Specification (10 Credits) – Spring 2017/18

1. Pre-requisites & Co-requisites; Assessment Details

P: None; C: None; A: Coursework 50%, Written Examination 50%

2. Lecturer

Chew Sze-Ker (Mr)
Contact: 03-89248140 (Office Phone); BB59 (Room)
E-mail: chew.sze-ker@nottingham.edu.my

3. Summary of Content

Building on the material presented in the Foundations of Software Engineering module, you will cover two main aspects of the software engineering process in depth: requirements and design. This will cover modern approaches to large scale requirements and engineering and specification, and approaches to systems and architectural design. You will spend around two hours per week in lectures and one hour in labs for practical experience for this module.

4. Weekly Programme

Week No	Lecture Topic
1	Revision on Software Processes and Activities
2	Revision on Agile Software Development
3	Requirement Engineering (functional, non-functional, document)
4	Requirement Engineering (specification, processes, elicitation and analysis)
5	System Modelling (context, interaction and structural)
6	System Modelling (behavioral and model-driven engineering)
7	Architectural Design (design and views)
8	Architectural Design (patterns and application architectures)
9	Design and Implementation (UML)
10	Design and Implementation (design patterns)
11	Revision

5. Resources

No	Name of Author(s)	Year of Publication	Title of Book	Edition	Publisher	ISBN
1	Ian Sommerville	2011	Software Engineering	9th	Pearson	0-137-05346-0
2	Roger Pressman, Bruce Maxim	2015	Software Engineering: A Practitioner's Approach	8th	McGraw Hill Education	0-078-02212-6
3	Kenneth Kendall, Julie Kendall	2014	System Analysis and Design	9th	Pearson	0-273-78710-1

COMP3028 (G53SEC) – Computer Security (10 Credits) – Spring 2017/18

1. Pre-requisites (P) & Co-requisites (C); Assessment Details (A)

P: Knowledge of computer networks; C: None; A: Coursework - 40%, 1-hr Written Examination - 60%

2. Lecturer

Michael Chung (Mr)
Contact: 03-89248142 (Office), BB58 (Room)
E-mail: michael.chung@nottingham.edu.my

3. Summary of Content

Spending four hours a week in lectures and computer classes, you'll cover the following topics: security of the computer; network security; internet security; software and hardware security; mobile security; and cryptography. You will gain familiarity with the most common attacks on modern computer systems, and defences against these.

4. Weekly Programme

Week No	Lecture Topic
1	Introduction, Foundations of Security
2	Foundations of Security
3	Cryptography I, II
4	Cryptography III, Authentication
5	Access Control, Reference Monitors
6	Software Vulnerabilities, Exploits
7	Network Security, Firewalls
8	Internet Security, Windows Security
9	Windows Security
10	Database Security
11	Intrusion Detection
12	Revisions

5. Resources

No	Name of Author(s)	Year of Publication	Title of Book	Edition	Publisher	ISBN
1	Dieter Gollman	2011	Computer Security	3rd	Wiley	978-0-470-74115-3
2	Ross Anderson	2007	Security Engineering	2nd	Wiley	978-0-470-06852-6

COMP3029 (G53VIS) – Computer Vision (20 Credits) – Spring 2017/18

1. Pre-requisites (P) & Co-requisites (C); Assessment Details (A)

P: COMP 1028 (G51PGA); C: None; Recommended: COMP 2032 (G52IIP); A: Coursework 1 - 10%, Coursework 2 – 30%; 2 Hour Written Examination 60%

2. Lecturer

Iman Yi Liao (Dr)
Contact: 03-87253438 (Office Phone); BB63 (Room)
E-mail: Iman.Liao@nottingham.edu.my

3. Summary of Content

You'll examine current techniques for the extraction of useful information about a physical situation from individual and sets of images. You'll cover a range of methods and applications, with particular emphasis being placed on the detection and identification of objects, recovery of three-dimensional shape and analysis of motion. You'll learn how to implement some of these methods in the industry-standard programming environment MATLAB. You'll spend around four hours a week in lectures, tutorial and laboratory sessions.

4. Weekly Programme

Week No	Lecture Topic
1	Introduction to Computer Vision
2	Segmentation & Features
3	Stereopsis: Correspondence, correlation
4	Matching Patches, Points, and their Strategies
5	Stereopsis: Dense Correspondence
6	Motion Estimation: Optical Flow
7	Visual Tracking: Particle Filters, MCMC
8	Multiview Stereo Vision
9	Object Detection: HOG, Bag-of-Features
10	Object Detection: Viola-Jones, CNN
11	Performance Evaluation: Optical Flow & Segmentation
12	Revision

5. Resources

No	Name of Author(s)	Year of Publication	Title of Book	Edition	Publisher	ISBN
1	David A. Forsyth, Jean Ponce	2012	Computer Vision: A Modern Approach	2nd	Pearson	0-273-76414-4
2						

COMP3046 (G53PDC) – Parallel Computing (10 Credits) – Spring 2017/18

1. Pre-requisites (P) & Co-requisites (C); Assessment Details (A)

P: or equivalent knowledge and experience of computer programming. In addition, familiarity with concurrent programming using threads would be helpful (eg. G52OSC), C: None; A: Final Exam 100%

2. Lecturer

KR Selvaraj (Mr)
Contact: 03-89248139 (Office Phone); BB60 (Room)
E-mail: kr.selvaraj@nottingham.edu.my

3. Summary of Content

A simple sequential computer program effectively executes one instruction at a time on individual data items. Various strategies are used in CPU design to increase the speed of this basic model, but at the cost of CPU complexity and power-consumption. To further increase performance the task must be re-organised to explicitly execute on multiple processors and/or on multiple data items simultaneously This module charts the broad spectrum of approaches that are used to increase the performance of computing tasks by exploiting parallelism and/or distributed computation. It then considers in more detail a number of contrasting examples. The course deals mainly with the principles involved, but there is the chance to experiment with some of these approaches in the supporting labs. Topics covered include: common applications of parallel computing; parallel machine architectures including Single Instruction Multiple Data (SIMD) or short-vector processing; multi-core and multi-processor shared memory; custom co-processors including DSPs and GPUs, and cluster and grid computing; programming approaches including parallelising compilers; explicit message-passing (such as MPI); and specialised co-processor programming (such as for GPUs).

4. Weekly Programme

Week No	Lecture Topic
1	Background of Parallel Computing
2	Programming Environments for Parallel and Distributed Programming
3	Common applications of Parallel and Distributed computing
4	Visualizing Concurrent and Distributed System Design
5	Parallel Machine Architectures including Single Instruction Multiple Data (SIMD), Multi-core and Multi-processor shared memory
6	Vector Algorithms and Architectures, Distributed Memory Multiprocessors
7	Custom co-processors including DSPs and GPUs
8	Cluster and grid computing; Distinction from Parallel Systems. Distinctions from Distributed Systems.
9	Programming approaches including parallelising compilers
10	Work Breakdown Structure for the MPI, Message Passing Program. Using Template Functions to Represent MPI Tasks
11	Specialised Co-processor programming
12	Revision

5. Resources

No	Name of Author(s)	Year of Publication	Title of Book	Edition	Publisher	ISBN
1	Cameron Hughes, Tracey Hughes	2004	Parallel and Distributed Programming Using C++		Addison-Wesley Professional	

COMP3042 (G53FIV) – Fundamentals of Information Visualisation (10 Credits) – Spring 2017/18

1. Pre-requisites (P) & Co-requisites (C); Assessment Details (A)

P: None; C: None; A: Exam – 75%, Coursework – 25%

2. Lecturer

Marina Ng (Dr)
Contact: 03-87253412 (Office Phone); BB71 (Room)
E-mail: Marina.Ng@nottingham.edu.my

3. Summary of Content

Information Visualisation is the process of extracting knowledge from complex data, and presenting it to a user in a manner that this appropriate to their needs. This module provides a foundational understanding of some important issues in information visualisation design. You will learn about the differences between scientific and creative approaches to constructing visualisations, and consider some important challenges such as the representation of ambiguous or time-based data. You will also learn about psychological theories that help explain how humans process information, and consider their relevance to the design of effective visualisations.

If you want to learn how to design and implement your own interactive information visualisation, you should also take the linked module G53IVP (Information Visualisation Project). Together, these two modules form an integrated 20 credit programme of study.

4. Weekly Programme (*Subject to Change*)

Week No	Lecture Topic
1	Introduction
2	Data, Image and Data Representation
3	Multivariate Data Representation; Task Abstraction
4	Tools, R Basics
5	Visual Perception
6	Interaction
7	Evaluation
8	Visualising Text
9	Visualising Document & Time series
10	Trees and Graphs
11	Revision

5. Resources

No	Name of Author(s)	Year of Publication	Title of Book	Edition	Publisher	ISBN
1	Colin Ware	2012	Information Visualisation: Perception for Design	3rd	Morgan Kaufmann	9780123814647
2	Tamara Munzner	2015	Visualization Analysis and Design	1st	CRC Press	9781466508910

COMP3045 (G53IVP) – Information Visualisation Project (10 Credits) – Spring 2017/18

1. Pre-requisites & Co-requisites; Assessment Details

P: None; C: COMP3042 (G53FIV); A: Coursework – 80%, Presentation - 20%

2. Lecturer

Marina Ng (Dr)
Contact: 03-87253412 (Office Phone); BB71 (Room)
E-mail: Marina.Ng@nottingham.edu.my

3. Summary of Content

This module provides an opportunity to put into practice knowledge and understanding that you have developed through the linked module G53FIV. You will gain practical experience of how to design, implement and evaluate a distinctive interactive visualisation which presents information gathered from a complex and interesting data source. The primary focus is on building a working application of information visualization, and so existing strong programming ability is required to take this co-requisite with G53FIV.

4. Weekly Programme

Week No	Lecture Topic
1	Introduction
2	Infographics
3	Data representation
4	Visualisation systems
5	Tool: Tableau
6	Design studies
7	Group assignment
8	Poster session
9	Algorithms for Extracting Data
10	Group presentation
11	Revision

5. Resources

No	Name of Author(s)	Year of Publication	Title of Book (Primary)	Edition	Publisher's Name	ISBN
1	Colin Ware	2012	Information Visualisation: Perception for Design	3rd	Morgan Kaufmann	9780123814647
2	Tamara Munzner	2015	Visualization Analysis and Design	1st	CRC Press	9781466508910