Xi'an Jiaotong-Liverpool University
西交利物浦大學

Department of Electrical and Electronic Engineering

MODULE HANDBOOK

EEE101

C Programming and Software Engineering I

Mark Paul Leach, Rui Lin

Semester 1

2017/2018

SECTION A: Basic Information

- **Brief Introduction to the Module**

The learning of a computer programming language provides not only a powerful tool for solving complex problems, but also underpins the very mind-set required to be an engineer. The development of your ability to analyse and construct a solution to an engineering problem will aid in your development as an engineer. C Programming is used as a standard in engineering, it can be used on many different operating platforms and in particular is commonly used to program microcontrollers and other embedded systems found in everything from automobiles to TV's. The programming skills you will learn are highly transferrable. In general, once you have developed the basic skills as a programmer in any language, it is reasonably straightforward to learn new languages.

The module assumes no prior knowledge or experience of any programming. Information about programming constructs is offered during lecture sessions, whilst practical laboratory sessions each week provide you with the opportunity to experiment with the knowledge you have learned. Being a good programmer requires a great deal of practice, but once you have developed your understanding of the langrage as well as the ability to solve problems, you may just begin to see it as fun.

- **Key Module Information**

Module name: *C Programming and Software Engineering I*

Module code: *EEE101*

Credit value: *5*

Semester in which the module is taught: *S1*

Pre-requisites needed for the module: *None*

Programmes on which the module is shared:
BEng Digital Media Technology
BEng Electrical Engineering
BEng Electronic Science and Technology
BEng Telecommunications Engineering

- **Delivery Schedule**

Lecture room: *EE101*

Lecture times: *Monday: 09:00-11:00, 14:00-16:00, week 1-4, 5-6, 8-14*

Lab room: *EE311, EE309*

Lab times: *Wednesday: 11:00-13:00; Thursday: 9:00-11:00; Friday: 09:00-11:00, 11:00-13:00, 10:00-12:00, 13:00-15:00, 14:00-16:00, Week 1-4, 5-6, 8-14*

- **Module Leader and Contact Details**

Name: *Mark Paul Leach*

Brief Biography:
Mark Paul Leach received the BEng(Hons) in Communication and Electronic Engineering from the University of Northumbria, UK in 1999 and Ph.D from the same institution in 2005. Dr. Leach worked as a research associate from 2003 to 2008 in the field of Microwave Holography. From 2008 - 2013 Dr. Leach was employed as a lecturer at Seoul National University of Science and Technology, conducting research into thin films for photovoltaic applications. In 2013 Dr. Leach joined the Department of Electrical and Electronic Engineering at Xi'an Jiaotong Liverpool University, as an Associate Professsor his current research interests are in antennas, RF/microwave engineering, EM measurements/simulations, wireless power/energy transfer, wireless communication networks and energy harvesting.

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Preferred means of contact: *Mark.Leach@xjtlu.edu.cn*

- **Co-Module Leader and Contact Details**

Name: *Rui Lin*

Brief Biography:
Dr. Rui Lin received BEng. in Industrial Automation (mechatronics) from Shanghai University in 1995 , Master of Engineering (by research) and Ph.D (both research degrees are in the field of wireless telecommunication PHY layer design) from the University of Canterbury, New Zealand, in 2007 and 2011, respectively. From 1995 to 2002, Dr. Lin worked as a charted engineer in Shanghai Electrical Automation

Research Institute. From 2011 to 2012, Dr. Lin was employed first as a research engineer at University of Canterbury and then an electronic engineer in an electronic company based in Sydney, Australia. From 2012 to 2013, Dr. Lin was employed as a postdoctoral research fellow at Nanyang Technological University (NTU), Singapore. Dr. Lin joined the EEE department at XJTLU in 2014.

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SECTION B: What you can expect from the module

- **Educational Aims of the Module**

Despite the popularity of newer languages such as C++ and Java the C language remains a core skill in the software business ranking in the top ten desired skills. C is one of the most popular languages for programming embedded systems that are found in automobiles, cameras, DVD players and many other modern appliances.

This module aims to enable students to:

Learn and use the C programming language

Use the C language to solve real engineering problems

Acquire fundamental software development skills covering program design, coding and testing.

- **Learning Outcomes**

Students completing the module successfully should be able to:

A. demonstrate knowledge and understanding of the basic principles of the C programming language;
B. demonstrate knowledge and understanding of the basic role and function of hardware and software components of a computer;

C. demonstrate knowledge and understanding of the software development process;

D. design, code, debug, test and document computer programs written in the ANSI C language to meet requirements supplied in a specification;

E. design modular programs following the top-down function-oriented approach.

F. analyse understand and modify existing code written in C;

Assessment Details

Initial Assessment

Sequence	**Method**	**Assessment Type(EXAM or CW)[2]**	**Learning outcomes assessed***(use codes under Learning Outcomes)*	**Duration**	**Week**	**% of Final Mark**	**Resit(Y/N/S)[3]**
001	Assignment 1	CW	A-D			15	S
002	Assignment 2	CW	A-E			15	S
003	Assignment 3	CW	ALL			35	S
004	Assignment 4	CW	ALL			35	S

Resit Assessment

Sequence	**Assessment Type (EXAM or CW)**	**Learning outcomes assessed** *(use codes under Learning Outcomes)*	**Duration**	**Week**	**% of Final Mark**
R001	EXAM	ALL	3 hours		100

- **Methods of Learning and Teaching**

This module is delivered as one two hour lecture and two hours practical programming in the computer laboratory, each week. The concepts introduced during the lecture are illustrated using step-by-step analysis of example code, complete case studies and live programming tutorials. Each week the students have to solve a set of exercises during the laboratory classes and submit the completed work electronically. The students are assisted during the practical laboratory classes by demonstrators.

- **Syllabus & Teaching Plan**

Week number and/or date	Lecture/ Laboratory	Topic/Theme/Title	Pre-reading
Week 1	*Lecture 1*	Introduction to module	*Lecture slides*
Week 2	*Lecture 2*	Anatomy of a C program.	*Lecture slides*
Week 3	*Lecture 3*	Binary, I/O, Characters and Arrays	*Lecture slides*
Week 4	*Lecture 4*	Functions	*Lecture slides*
Week 5	*Lecture 5*	Relational/logic operators, Flow control	*Lecture slides*
Week 6	*Lecture 6*	Loops	*Lecture slides*
Week 7	*Lecture 7*	Pointers and arrays	*Lecture slides*
Week 8	*Lecture 8*	Pointers and arrays	*Lecture slides*
Week 9	*Lecture 9*	Functions and multidimensional arrays	*Lecture slides*
Week 10	*Lecture 10*	Functions and multidimensional arrays	*Lecture slides*
Week 11	*Lecture 11*	File I/O operations	*Lecture slides*
Week 12	*Lecture 12*	Data structures	*Lecture slides*

- **Reading Materials**

Recommended Texts:

Title	Author	ISBN/Publisher
THE C PROGRAMMING LANGUAGE	BRIAN W. KERNIGHAN & DENNIS M RITCHIE	ADDISON WESLE
PROBLEM SOLVING & PROGRAM DESIGN IN C	JERY R. HANLY & ELLIOT B. KOFFMAN	ADDISON WESLE
C PRIMER PLUS	STEPHEN PRATA	JOHN WILEY &

SECTION C: Further Information

- **Student Feedback**

The University is keen to require student feedback to make improvements for each module in every session. It is University policy that the preferred way of achieving this is by means of an Online Module Evaluation Questionnaire Survey. Students will be invited to complete the questionnaire survey for this module at the end of the semester.

You are strongly suggested to read policies mentioned below very carefully, which will help you better perform in your academic studies. All the policies and regulations related to your academic study can be found in Student Academic Services section under the heading "Policies and Regulations" on E-bridge.

- **Plagiarism, Cheating, and Fabrication of Data.**
  Offences of this type can result in attendance at a University-level committee and penalties being imposed. You need to be familiar with the rules. Please see the "Policy for Dealing with Plagiarism, Collusion and Data Fabrication" document available on e-Bridge in the Student Academic Services section under the heading 'Policies and Regulations'.

- **Rules of submission for assessed coursework**
  The University has detailed rules and procedures governing the submission of assessed coursework. You need to be familiar with them. Details can be found in the "Code of Practice for Assessment" document available on e-Bridge in the Student Academic Services section under the heading 'Policies and Regulations'.

- **Late Submission of Assessed Coursework**
  The University attaches penalties to the late submission of assessed coursework. You need to be familiar with the University's rules. Details can be found in the "Code of Practice for Assessment" document available on e-Bridge in the Student Academic Services section under the heading 'Policies and Regulations'.

- **Mitigating Circumstances**
  The University is able to take into account mitigating circumstances such as illness or personal circumstances which may have adversely affected student performance on a module. It is the student's responsibility to keep their Academic Adviser, Programme Director or Head of Department informed of illness and other factors affecting their progress during the year and especially during the examination period. Students who believe that their performance on an examination or assessed coursework may have been impaired by illness, or other exceptional circumstances should follow the procedures set out in the Mitigating Circumstances Policy, which can be found on e-Bridge in the Student Academic Services section under the heading 'Policies and Regulations'.

- **ICE**
  Copies of lecture notes and other materials are available electronically through ICE, the University's virtual learning environment at: ICE @ XJTLU.