Module Outline: Nature of Computing Comp 3402 2022-23

This Module Outline provides details of your module and your learning objectives that you need to know to achieve a successful module outcome.

1. When do I have to attend my module sessions?

Occurrence	Day	Time	Room
Sem1 - A	Tues	09:15 – 10:45	CH 1009
	Tues	14:15 – 15:45	CH 1009
Sem1 - B	Mon	09:15 – 10:45	CH 1007
	Tues	12:15 – 13:45	CH 1007
Sem2 - A	Mon	13:15 – 14:45	CH 1001
	Tues	09:15 – 10:45	CH 1007
Sem2 - B	Mon	09:15 – 10:45	CH 1007
	Tues	12:15 – 13:45	CH 1007

Room information: *Students are advised to check room details on the Live Timetable System link on the UW website Student portal.*
Should on occasion class cancellations be necessary, notifications will be made in accordance with the Class Cancellation Policy, which can be found here.

2. Who will be teaching me on my module?

Name	Email address	Room No	Staff Profile
Module Leader: Dr. Colin Price	c.price@worc.ac.uk	CH2005	https://www.worcester.ac.uk/about/profiles/dr-colin-b-price https://colin-price.wbs.uni.worc.ac.uk/index.htm

To obtain help with your learning within this module please contact your Tutor or Module Leader by email, c.price@worc.ac.uk

3. What are the main themes of my module?

In addition to coherent technical and pedagogical themes running throughout the sessions, there are three more general themes:

1) Sustainable Development Goals (UNESCO SDGs) in particular the study of wind turbines and also vibration energy harvesting. These should help you become more aware of some technical and theoretical aspects of green energy.

2) Learning by talking and listening. You will be actively encouraged to talk with your classmates and with your tutor to discuss ideas, solve problems, debug code, and plan your assignments. The theory behind how conversations help you learn has been developed by the Faculty of Education at Cambridge University. We are fortunate to be collaborating with these folk, to better understand their theory, it's called 'Dialogic Learning'.

3) Choice. This has been built into most assignments to allow you to select the best approach for you as an individual, to aid your individual learning, and develop your individual skills.

W/C		Preparation		Learning Activities	LOs
12-Sep		**Induction Week**			
19-Sep	1	PP1.1 Brief		**POSITION PAPER 1 (Part 1)**	
26-Sep	2				1
3-Oct	3	Read Chapter 1		Image Processing: Enhancement and Segmentation.	
10-Oct	4				
17-Oct	5	PP1.2 Brief	PP1.1 Early-Bird	**POSITION PAPER 1 (Part 2)**	
24-Oct	6	Read Chapter 3			
31-Oct		**Progression Week & Graduation**		Alternative Energy, Wind Turbine control and Wind Farm design.	3
7-Nov	7	Read Chapter 3			
14-Nov	8				
21-Nov	9	PP2.1 Brief	PP1 Official Hand-in	**POSITION PAPER 2 (Part 1)**	
28-Nov	10			Logic in Language and Digital Logic.	4
5-Dec	11	Read Chapter 11		Algorithmic Beauty of Plants	
12-Dec	12	Agree Choice of Topics for PP3.1			
19-Dec		**Christmas Break:**			
26-Dec		**Christmas Break:**			
2-Jan		**Revision week and Personal mid-year review**			
9-Jan		**Assessment Week**			
16-Jan	13	PP2.2 Brief	PP2.1 Early-Bird	**POSITION PAPER 2 (Part 2)**	
23-Jan	14				5
30-Jan	15	Read Chapter 12		Design and Synthesis of Digital and Analogue Computers	
6-Feb	16				
13-Feb	17	PP3.1 Brief	PP2 Official Hand-in	**POSITION PAPER 3 (Part 1)**	
20-Feb	18				
27-Feb		**Progression Week:**		Mini-Project: Extension of previous work or choice from new topics (to be agreed 12th Dec 2022)	2
6-Mar	19				
13-Mar	20				
20-Mar	21	PP3.2 Brief	PP3.1 Early-Bird	**POSITION PAPER 3 (Part 2)**	
27-Mar	22	Read Chapter 6		Modern Operating Systems:	6
3-Apr		**Easter Break:**		1) Free-RTOS (Arduino)	
10-Apr		**Easter Break:**		2) OpenMP parallel programming in Visual Studio.	
17-Apr	23				

24-Apr	24	PP3 Official Hand-in
1-May	**Revision week**	
8-May	**Assessment Week**	
15-May	**Assessment Week**	

4. What is my module week-by-week contents and what do I have to prepare for each session?

This module will be run from the module leader's website, https://colin-price.wbs.uni.worc.ac.uk/index.htm . A link will be placed in Blackbeard. All assignments will be submitted via Blackbeard.

Bank Holiday Monday – 1 May 2022
Reassessment Week: w/c 3 July 2022

5. How is this module taught?

There are three units of instruction, each spread over 8 weeks. Each unit is divided into two, with an associated position paper. So effectively you will focus on 6 domains of computing.

There will be occasions where you are able to choose between activities, according to your interest, and one group of 4 sessions will be dedicated to a 'Design-Build-Test' mini-project where you will work in small groups to solve a problem.

Teaching will consist of short tutor inputs (which will also be released as 'mini-lectures'). All sessions will be hands-on and will be organised through worksheets. You will be encouraged to have conversations with your fellow students both in class and outside sessions. All units of instruction will be supported by the module leader's book chapters.

6. What will I be able to do when I have attended and actively participated in all sessions of my module?

Attendance is essential to your successful module outcome, your degree classification and the development of your employment skills. Active participation in all sessions, whether online or face-to-face, will help you to develop your Graduate Attributes and achieve the module's learning outcomes:

a) **Learning Outcomes of this module are:**

(1) Reflect, critically on alternative and emerging computing technologies.

(2) Critically analyse important contemporary applications of computers.

(3) Critically assess how an understanding of the natural world helps us create digital worlds through programming.

(4) Critically evaluate the structure and function of autonomous intelligent systems

(5) Critically reflect on the design of digital and analogue computers

b) **Your contribution to your Graduate Attributes (which contribute to your employability skills) is:**

Reflective and resilient lifelong learning: You will be encouraged to talk and listen and to value the place of conversation in learning. This is a good preparation for employment.

Problem solving: Some activities are creative, others allow you to investigate, but most will have an element of problem-solving (understood in its broadest sense) where you will have opportunity to develop your thinking skills.

Teamwork and effective communication: You will experience teamwork in the 'Design Build Test' mini-project (this will not be assessed) and you should take this as an opportunity to develop your communication skills; listening to others and reflecting on their point of view and so perhaps changing yours, becoming confident of your point of view and getting this across to others.

Digital citizenship: This should happen automatically because of the nature of the Course.

7. How does my module engage with the real-word environment?

Results of scientific research of broad interest will be noted weekly. More extensive discussions will take place when this research is relevant to the study unit.

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8. What have previous students said about my module?

Here are some themes which have emerged from previous years:

1) Great teaching, enthusiastic lecturer, learning became fun and entertaining.

2) The way the content was broken down into smaller sections, when complete you got that "small win"

3) Great variety of topics covered, thought-provoking

4) Clear lectures and workshops related to the assignments

9. Are there any special instructions for this module I need to be aware of?

Please make sure you have access to the following software on your own computer:

1) Octave

2) Unreal – 4.47.2 engine

3) The latest Arduino IDE

10. What are my assignments for this module?

Detailed information on the assignments for this module and instructions on how to complete them are provided in your Assignment Briefs which are available on your module's Blackboard site.