Module Outline: Robotics Comp2403 **2020-21 Sem1**

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1. Things I need to know to achieve a successful module outcome:

Occurrence A	Date/time	Room:
	Face-to-face or Online workshops	
	Monday 09:15 – 10:45	CH1001
	Monday 12:15 – 12:45	CH1001
	Online Presentations	
	Tuesday 09:15 – 10:15 (online support during this time)	Available at any time.

2. Who are my teaching team?	Dr. Colin Price, c.price@worc.ac.uk, Room CHLG020, Phone 542024	MA in Natural Sciences majoring in Experimental Physics (Cambridge), PhD Electronic Engineering (University of Leuven – Belgium), Fellow of the Higher Education Academy, National Teaching Fellow. Over 70 research publications in areas of Theoretical Physics, Literacy, Computer Science and Computer Science Education.

3. What will I be able to do when I have attended and actively participated in this module?	Attendance is essential to your successful module outcome and your degree classification. Active participation in all sessions whether online or face-to-face will help you to: 1. Demonstrate an understanding of robot control architectures. 2. Apply the theory of robot kinematics. 3. Implement a range of sensor and motor-drive systems. 4. Design, build and test a robot application to solve a given problem.

4. How does my module fit into my course?	This module will develop your critical thinking skills, and also planning and evaluation (through the Design-Build-Test mini-project). You will sharpen your mathematical skills and also develop competence in the programming of robots using the language 'C'. Each module and each level of your course progressively builds towards higher order skills and capabilities that you need to achieve the best results in your life. If you do not understand how this module fits into your overall course please discuss this with your module tutor/course leader.

5. How does my module engage with the real-word environment?	You will be working with simulations of real-world robots. Some of these robots are used in industry, others are well-known research robots.

6. How will my module help me enhance my academic skills and employment skills?	As businesses now frequently ask for details of your module attendance in your reference, we recommend that you attend all lectures and workshops whether they are online or face-to-face. By attending and participating in lectures and workshops you will get to work in groups, collaborate, share ideas, negotiate and influence others. These are all key employment skills that your future employers will expect from you. On this module, through enquiry-based learning you will learn how to apply concepts to solve rea-world problems. You will develop critical skills in the Design-Build-Test mini-project. Here you will have the opportunity to work together in teams where you will develop time-management skills. You will also be able to apply basic mathematical knowledge in problem solving. The UW Careers & Employability Service is your online portal that contains tools to support students and graduates plan and manage their careers and develop employability skills. This includes 'myCareer', our new online platform for students to search for placements, internships and graduate roles, book onto careers fairs, workshops and events, access eGuidance, and complete the Worcester Award. Your WBS Employability Enhancement Hub is your online self-assessment portal that contains tools that allows you to map your employment skills and personal qualities against what employers want from graduates. By using it you will discover what you have learned from your academic study, work experience and extra-curricular activities and be shown how to demonstrate them in your CV.

7. What do I need to know before I attend and participate in my lectures?	Face-to-face sessions will run in the CH1001 with an on-line session at the same time. You are expected to attend either face-to-face or online. Learning and teaching will be organised around sessions aligned to each intended learning outcome. Most sessions will involve an enquiry-based approach to learning within a well-defined space of choices crafted by the tutor. Initial sessions will be devoted to learning and exploring basic concepts of autonomous robots. These will be followed by sessions devoted to a "design-build-test" project where students will work in teams to solve a given problem. Formative feedback will be offered during the semester.

8. How can I help myself to achieve a successful outcome?	You need to do a lot of reading to obtain your degree. This means you must get used to conducting independent study and using the library resources such as journal articles, books, data bases, etc. to source credible information. These are available from the Library website: (https:/library.worc.ac.uk). To ensure you can achieve a successful outcome of this module, you must prepare for each lecture through independent study. Your preparation for each lecture is shown in the Module Programme in this document; the sources identified for each week's preparation are provided in the module's Talis Aspire Resource List which is available via a link in your module's Blackboard site or via: https://worc.rl.talis.com/index.html. To obtain your best module outcome you must attend and fully participate in all sessions. If you cannot attend any of your online or face-to-face sessions for any reason you must notify the module leader as soon as possible before the session. Continued non-attendance / disengagement may lead to you being removed from the course. If you need help with your academic skills such as academic writing, referencing, critical analysis, independent study, time management, etc. please contact Firstpoint in the Peirson Study and Guidance Centre on St John's Campus, call them on 01905 542551, or email firstpoint@worc.ac.uk. Further information is available on the Firstpoint website: https://www.worcester.ac.uk/life/help-and-support/services-for-students/firstpoint.aspx and the Library website: https://library.worc.ac.uk. **The Academic Liaison Librarian for the Business School** is available by email: askalibrarian@worc.ac.uk. **If there is anything which is unclear, or you do not understand, please ask a member of the module team.**

9. What is my responsibility in Comp2403	It has been proven that your lecture attendance is strongly linked to your module success. As we want you to do well, we recommend you attend all of your online or face-to-face lectures and workshops, undertake all of your lecture preparation, participate with in-class activities and ask for help if you need it. If you cannot attend for any reason you must notify the module leader as soon as possible before the session. If the module leader knows you are unable to attend, they will be able to help you catch back what you have missed. Your non-attendance / disengagement in the lectures may lead to you being removed from the module. **If there is anything which is unclear, or you do not understand, please ask a member of the module team.**

10. How do I get help if I have a disability or a particular learning need?	The University of Worcester is committed to ensuring diversity and equality within our learning, teaching and assessment practice. If you have a registered disability or particular learning need and you wish this to be taken into account, please speak to your Personal Academic Tutor or let the module leader know. You will find additional useful information on the Disability and Dyslexia webpages at https://www2.worc.ac.uk/disabilityanddyslexia/

11. What is my assessment / are my assessment(s)?	There is a single item of assessment which carries 100% of the grades. During the module sessions, you will assemble a portfolio of work. This will include e.g., robot code, results of investigations and your Design-Build-Test mini-project. You will submit your project via Blackboard by Monday Jan 4th 2021. The module tutor will then provide you with questions on material in your portfolio, by January 8th. There will be four questions, one for each learning outcome. You will voice record your answers to these questions and submit your recordings via Blackboard on Wednesday Jan 13th 2021.

Assignment 001	
Word Limit or equivalent (e.g. time)	Your voice recording should be no longer than 30 minutes, however there will be no penalty for exceeding this, up to 50 minutes, after which material will not be graded
Weighting	100%
Learning Outcomes Assessed	1. Demonstrate an understanding of robot control architectures. 2. Apply the theory of robot kinematics. 3. Implement a range of sensor and motor-drive systems. 4. Design, build and test a robot application to solve a given problem.
Submission date	• Portfolio: Monday Jan 4th 2021 by 15:00 via Blackboard • Voice recording: Wed Jan 13th 2021 by 15:00 via Blackboard
Feedback date	All assignment feedback will be issued on the 20th working day following the submission deadline. Feedback will be released on: Wednesday 10th February 2010 or before.
Module Leader	Colin Price
Verified by	Pete Moody

12. My Module Timetable

W/C date		Readings from Siegwart & Nourbakhsh	Topic	How does this link to my Assessment?
14 Sept		Induction Week / Review Week *Computing PAT meetings level 4, 5 & 6 (Groups)*		
21 Sept	1	Webots documentation Chapter 2	Intro to Webots IDE. Boebot robot and FSM architecture	1
28 Sept	2	Chapter 4	Sensors	3
5 Oct	3	Chapter 3	2-wheeled robot kinematics	2
12 Oct	4	Chapter 5	Obstacle detection	1,3
19 Oct	5	Chapter 6	Navigation	1,3
26 Oct	6		Line following	1,2,3
2 Nov		Progress Week and Award Ceremonies		
9 Nov	7	*PAT meeting*	Advanced Sensors (cameras, Laser Scanner)	3
16 Nov	8	*PAT meeting*	Quadruped Robots and Central Pattern Generators	1,2
23 Nov	9		Subsumption Archtecture	1,2,3
30 Nov	10		Design-Build-Test mini-project	4
7 Dec	11		Design-Build-Test mini-project	4
14 Dec	12		Design-Build-Test mini-project	**4**
21 Dec		**Christmas Break**		
28 Dec		**Christmas Break**		
4 Jan		**Revision week and Personal mid-year review** Portfolio: Monday Jan 4th 2021 by 15:00 via Blackboard		
11 Jan		**Assessment Week** Voice recording: Wed Jan 13th 2021 by 15:00 via Blackboard		

Reassessment Week: 5 July 2021 – 16 July 2021