UNIT FORM

1.	**Unit Title** (up to 50 characters)	Mechatronics
2.	**Department Offering Unit**	MECHANICAL ENGINEERING
3.	**Faculty Offering Unit**	ENGINEERING
4.	**Unit Code**	MENG26004
5.	**Level**	4/C
6.	**Credit Points**	10
7.	**Unit Director** **Contact Phone No. & E-Mail Address**	Dr J Burn 0117 3315940 J.F.Burn@bristol.ac.uk
8.	**Status Of Unit**	

	Optional	Yes	Optional for which programmes? H150
	Mandatory	No	Mandatory for which programmes?
	Open Unit	~~Yes~~/No	

10.	**Pre-requisite Unit Code(s)/information**	MENG16000 or equivalent
11.	**Co-requisite Unit Code(s)/information**	None

12.	**Description of this Unit (not more than 150 words):**
	Mechatronics: The unit will enable students to develop the skills to identify key design parameters, select suitable components from manufacturers' data, produce detailed designs from this information, and meet the needs of mechanical engineers with respect to electromechanical systems. This is achieved using specific examples of mechatronic systems in the automotive, manufacturing, robotics and biomedical industries. The unit also covers sensors, their interface with microprocessors, actuators and computer-based control.
13.	**Key Reading and References** (maximum of six titles):
	Mechatronics: Mechatronics: Electronic Control Systems in Mechanical and Electrical Engineering (4th Ed.) W. Bolton, (Pearson/Prentice Hall), 2008.
14.	**Statement of Unit Aims:**
	Mechatronics: • Provide a foundation in motors, actuators, sensors and computer control required to carry out mechatronic engineering design tasks for automotive, aerospace and industrial automation applications. • Broaden the students' understanding of design process, and in particular the interfaces to other engineering disciplines with which they will need to interact as mechanical engineers. • Increase student awareness of design practice in industry. Prepare students for 3rd and 4th year projects requiring the use of sensors, actuators and computer control.
15.	**Statement of Learning Outcomes:**
	Mechatronics: • Interpret manufacturers' data sheets and select suitable components for a particular task. • Perform order of magnitude calculations and "back of envelope" calculations from first principles when tackling open-ended design tasks. • Select an appropriate motor or actuation system and set of sensors for a given application, providing reasons for the choices made. • Analyse overall system performance using both analytic methods and computer simulation. • Develop a specification for an integrated electromechanical system that includes one or more actuators, sensors and computer control. • Design and notate algorithms for control and data processing in mechatronic systems. • Evaluate different solutions to a given requirement making use of graphical tools such as morphological charts and objective trees.

16.	**Methods of teaching** (eg Lectures, seminars, fieldwork)**:**
	Mechatronics: 12 lectures on core subject material 1 seminar from external speaker from industry 3 tutorials of up to 20 minutes on research project
17.	**Number of contact hours:** 13 hours of lectures 6 hours of computer labs 1 hour of project tutorial time
18	**Methods of assessment**
	Mechatronics MECHATRONICS (50% coursework, 50% written exam) Coursework for mechatronics comprises two design exercises which require the generation of a preliminary design for systems comprising actuators and sensors respectively. For each lab students prepare a short technical report typically up to 8 pages of text and diagrams. The assessment of these exercises will be formative and not contribute to the marks for the unit. In addition students will be required to complete an exercise in original research of the technical and scientific literature on a subject of current relevance to design. Summative assessment will be based on a 25 page report prepared on the research subject. The report will be worth 25% of the marks for the unit. Knowledge, understanding of, and ability to apply core lecture material will be assessed by means of a two-hour written examination worth 25% of the marks for the unit.