Liverpool John Moores University

Warning: An incomplete or missing proforma may have resulted from system verification processing

Title:	MEDICAL ROBOTICS
Status:	Definitive
Code:	**6504ICBTBE** (129110)
Version Start Date:	01-08-2021
Owning School/Faculty:	Pharmacy & Biomolecular Sciences
Teaching School/Faculty:	ICBT, Colombo

Team	Leader
Katie Evans	Y

Academic Level:	FHEQ6	**Credit Value:**	10	**Total Delivered Hours:**	41
Total Learning Hours:	100	**Private Study:**	59		

Delivery Options
Course typically offered: Semester 2

Component	Contact Hours
Lecture	30
Tutorial	9

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	Exam	Examination	70	2
Report	Report	Coursework Assignment	30	

Aims

To provide relevant knowledge in the field of medical robotics, both in terms of the contemporary use of surgical robots and the mathematical and computational theory behind them.

Learning Outcomes

After completing the module the student should be able to:

1	Analyze and identify different types of medical robots and their potential applications.
2	Ability to apply concepts in kinematics, dynamics, and control relevant to medical robotics.
3	Develop the analytical skills necessary to design and implement robotic assistance for both minimally invasive surgery.
4	Analyze various roles that robotics can play in healthcare.

Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

Examination	1	3	4
Coursework Assignment	2		

Outline Syllabus

Introduction to Medical Robotics
Definitions; clinical background; evolution and history of medical robotics and applications.

Kinematics of medical robots
Segments of surgical manipulator; surgical tool positioning and joint position computation in surgical manipulators; computation of surgical manipulator tool point velocities and accelerations; surgical robot manipulator trajectory planning.

Sensors and actuation of medical robots
Sensors types in medical robots; actuation technologies utilized; robot control strategies used in medical robotic systems.

Designing of medical robots
Design considerations for medical robots; robot-assisted surgical systems and devices; function and advantages/ disadvantages of robot-assisted surgical systems; design features of current and future generations of medical robotic devices; safety standards of medical robotic systems

Learning Activities

Students will be supported in their learning, to achieve the above learning outcomes, in the following ways:
Classroom-based lectures and tutorial sessions will be conducted weekly.

Notes

This module is part of the Level 6 of the BEng(Hons) in Biomedical Engineering