Syllabus

No: ECE 7995

Title: Medical Robotics and Computer Integrated Surgery

Credits: 4

WSU Catalog Description:
Introduction to the field of Medical Robotics and Image Guided surgery. The course will have guest lectures from specialists in the field and will have group projects and reports.

Coordinator: Abhilash Pandya, Asst.Professor of Electrical and Computer Engineering.

Instructor: Abhilash Pandya, Electrical and Computer Engineering
Office Hours: or by appointment
Office: 3160 Eng Building
Phone: (313) 577-9921, Email: apandya@ece.eng.wayne.edu
Course Meeting Time: Thursdays 10:40-12:30
Course Meeting Location:

Goals: To develop competence in designing, developing and testing medical robotics and image guided techniques.

Learning Objectives: At the end of this course, students will be able to:

1. Understand the basics of robot kinematics
2. Know the basics about medical robotics and image guided surgery
3. Be able to write a proposal in this field.
4. Understand how these system are implemented.
5. Be able to critically read research papers in this field.

Textbook: None. Research papers will be posted for review.

Reference Texts: Computer Integrated Surgery, Taylor, Lavallee, Burden and Moeges
(This book is not required, but, will be a good reference.

Prerequisites by Topic: Linear Algebra, and knowledge in programming (Preferably C/C++)

Corequisites by Topic: none

Topics:

Unit 1: Introduction to Medical Robotics and Computer Integrated Surgery. Some basic robotic kinematics, and programming.

Unit 2 – Medical Imaging
Unit 3- Segmentation and 3D Modeling.

Unit 4: Tracking technology

Unit 5: Registration

Unit 6: Image Guided Surgery

Unit 7: Augmented and Virtual Reality

Unit 8: Evaluating Engineering Systems (Human Factors in Medicine).

Report Format:
- A cover page: It should include: Course name, Exp title and #, Student name(s) & ID(s).
- The content of the report: It should include: Objective, Theory, Equipments, Procedure, and Conclusions.

Computer Resources: Engineering laboratory computers

Distribution of Points: In class participation 10%, 4 individual assignments 40%, Final Project report 25%, Final Project Presentation 25%

Grading Scale:

95-100   A
90-94    A-
86-89    B+
80-85    B
Below    C
Or
Incomplete

Cheating Policy and Penalty for Cheating: The students should not copy each others reports. Group reports should be turned in with a note from each of the project participants to me as to which member did what percentage of work.