# Course Syllabus

## Second Semester – 2013/2014

### General Information

| Course name | Course code | Credits | Contact hours |
|---|---|---|---|
| Reverse Engineering for Medical Equipment | BMTS485 | 2 lecture+1 lab | 2 lecture+2 lab |

### Instructors/ Coordinators

| | Instructor | Coordinator |
|---|---|---|
| **Name** | Dr. Santhanaraj Balakrishnan | Dr. Santhanaraj Balakrishnan |
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### Text Book

| | |
|---|---|
| **Title** | Encyclopedia of Medical Devices and Instrumentation |
| **Author/Year** | John G Webster / 2006 |

### Supplemental materials

| **Recommended Textbooks and Reference Material** | |
|---|---|
| **Title** | The Medical Device R&D Handbook- Second edition |
| **Author/Year** | Theodore R. Kucklick / 2012 |
| **Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)** | |
| **Web sites** | http://en.wikipedia.org/wiki/Reverse_engineering |
| | http://www.instructables.com/id/How-to-reverse-engineer-a-schematic-from-a-circuit/step5/Circle-the-ground-plane-holes/ |

### Specific Course Information

**a. Brief description of the content of the course (Catalog Description)**

This course deals with reverse engineering which consist of design and development of existing biomedical instrument like ECG, heart pulse rate, oximeter, blood pressure measurement, pacemaker, defibrillators, etc. The student will replicate the instrument and test it.

**b. Prerequisites (P) or Co-requisites (C)**

None

**c. Course type (Mandatory or Elective)**

Elective

**Specific Goals**

| **a. Specific outcomes of instruction** |
|---|
| By the end of this course, the student should be able to:<br>- Classify different methods of reverse engineering. (b)<br>- Replicate the instrument and test it. (c)<br>- Create the block diagram of biomedical equipment from PCB. (d)<br>- Participate as a member of laboratory group in disassembly and assembly of biomedical equipment. (e)<br>- Analyze existing design of biomedical equipment. (f)<br>- Use the datasheets of electronic components for identification and analysis of existing equipment. (g)<br>- Select the appropriate intellectual property procedure in reverse engineering. (i) |

**b. Student outcomes addressed by the course**

| a | b | c | d | e | f | g | h | i | j | k |
|---|---|---|---|---|---|---|---|---|---|---|
| | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | | |

**Brief list of topics to be covered**

| Topics | No of Weeks | Contact hours |
|---|---|---|
| Reverse Engineering Concepts | 1 | 3 |
| White Box & Black Box Reverse Engineering | 2 | 6 |
| Reverse Engineering of Medical Equipments:<br>Eg: Analyzing existing design of biomedical equipment like ECG, heart pulse rate, oximeter, blood pressure measurement, pacemaker, defibrillators, | 6 | 18 |
| Tracing circuit diagrams of common medical equipments | 3 | 9 |
| Software Reverse Engineering | 2 | 6 |
| Ethics of Reverse Engineering | 1 | 3 |