

# Clinical Engineering - Master of Science in Clinical Engineering

The Master of Science in Clinical Engineering offers research (thesis) and course intensive (non-thesis) options, mostly in an online format. The mission of the program is to prepare students who wish to either pursue professional employment in the medical device industry and hospitals, or obtain a doctoral degree in biomedical engineering.

The unique features of this program are: (i) a required course in hospital rotation and (ii) a required internship in the medical or allied industry or in a hospital setting. The department faculty have active medical research projects in the areas of biomedical devices, tissue engineering, biomaterials, molecular simulation, biomechanics, biosensors, biophotonics, and enzyme treatment.

## Program Requirements

Code	Title	Credit Hours
CPB 502	Introduction to Clinical Engineering	3
CPB 535	Clinical Engineering Laboratory	2
CPB 552	Introduction to FDA Regulations and Medical Device Laws	3
CPB 545	Hospital Instrumentation	3
CPB 548	Hospital Rotation	3
CPB 528	Engineering Principles in Medical Device Design	3
CPB 614	Clinical Trials and Data Analysis	3
CPB 622	Engineering of Clinical Devices	3
EGM 511	Leading and Managing Projects	3
or MGT 553	Quality Management Systems	
or MGT 551	Operations Planning and Scheduling	
or MGT 644	Leadership, Change & Cross-Cultural Management	
or MGT 654	Strategic Human Resource Management	
CPB 600	Graduate Seminar	2
CPB 640	Internship	0-6
Complete the following for thesis option <sup>1</sup>		6
CPB 700	Research for Master's Thesis	
Complete the following for non-thesis option <sup>1</sup>		
CPB 710	Industrial Practicum	
CPB 553	Medical Device Development and Regulatory Considerations	
or CPB 526	Fundamentals of Tissue Engineering	
or EGM 511	Leading and Managing Projects	
or MGT 553	Quality Management Systems	
or MGT 551	Operations Planning and Scheduling	
or MGT 644	Leadership, Change & Cross-Cultural Management	
or MGT 654	Strategic Human Resource Management	
<b>Total Credit Hours</b>		<b>34-40</b>

Note: Every student enrolled in the program is required to engage in research and exploration of frontline issues related to clinical engineering and medical device design and development. This

is a research-oriented program with emphasis on creating new knowledge.

<sup>1</sup> For the thesis option, all students must complete a total of 34 semester hours, complete a research thesis (CPB 700 - Research for Master's Thesis, 6 hours) and pass a final examination. The major difference between the thesis and non-thesis options is while the former involves the creation and application of fundamental knowledge, the latter emphasizes research on application of the current knowledge (such as design) and innovation. Students in the non-thesis option will take the same number of credit hours (34) as for the thesis option, but will replace the six credit hours of CPB 700 with an industrial practicum (CPB 710, 3 hours) and an additional elective (3 hours). Non-thesis students must complete a research project under the supervision of a faculty member, write a comprehensive report, and make a formal presentation to a team of three faculty. This will constitute the final exam for the student. Each of these experiences (thesis or non-thesis) will include a written report detailing the research done, the plan developed for the student's activities, and a reflection on how they were successful in executing the work undertaken. The culminating experiences are the research thesis for the thesis option and the industrial practicum for the non-thesis.