



THE UNIVERSITY OF BRITISH COLUMBIA  
FACULTY OF APPLIED SCIENCE (Engineering)

**Category: (1)**

<p><b>Faculty:</b> Applied Science (Engineering)  <b>Department:</b> N/A  <b>Faculty Approval Date:</b> Nov. 10, 2005  <b>Effective Session</b> 06W  <b>Term 1 Year</b> September 2006</p>	<p><b>Date:</b> Feb. 10, 2006  <b>Contact Person:</b> Ezra Kwok  <b>Phone:</b> 604-822-1346  <b>Email:</b> ezra.kwok@ubc.ca</p>
<p><b>Proposed Calendar Entry:</b></p> <p><b>CLINICAL ENGINEERING – Master of Engineering Degree</b></p> <p><b>Members</b>  This is an interdisciplinary program. Professors come from a number of departments including but not limited to Chemical and Biological Engineering, Electrical and Computer Engineering, Materials Engineering, and Mechanical Engineering. The program website provides a link to all faculty members associated with the program.</p> <p><b>Professors</b>  G. A. Dumont, C. A. Haynes, M. Hodgson, V. Krishnamurthy, P. D. Lawrence, J. M. Piret, A. Poursartip, T. Salcudean, T. Troczynski, R. Ward</p> <p><b>Associate Professors</b>  S. A. Baldwin, S. S. Fels, G. Fernlund, A. J. Hodgson, E. Kwok (Director), T. R. Oxland, D. P. Romilly, R. F. B. Turner</p> <p><b>Assistant Professors</b>  M. Chiao, L. Chrostowski, P. A. Crompton, C. Hansen, J. Madden, R. N. Rohling, B. Stoeber, R. Wang, Z. J. Wang, D. Wilson, J. Yan</p> <p><b>Program Overview</b>  The Master of Engineering degree is offered to qualified engineering graduates who seek to apply engineering principles at an advanced level to medical technology. The Clinical Engineering program provides: a basic knowledge of the life and health sciences;</p>	<p><b>URL:</b> N/A</p> <p><b>Present Calendar Entry:</b> from the 1992/1993 Calendar</p> <p><b>CLINICAL ENGINEERING – M.Eng. Degree</b>  <b>Professor and Director:</b> Charles A. Laszlo  <b>Adjunct Professor:</b> J.A.McEwen, Electrical Engineering, Cecil Hershler, Rehabilitation Medicine.  <b>Clinical Instructors:</b> G.J. Eisler (B.C.I.T.), R.W. Evans (Children's Hospital), M. Henderson (Kingston General Hospital), J.R. Heyworth (St. Paul's Hospital), G. Klein (Royal Jubilee Hospital), K.D. Whitmore (Royal Columbian Hospital), D. Zilm (Kelowna General Hospital).</p> <p>The Master of Engineering degree is offered to qualified engineering graduates who seek to apply engineering principles at an advanced level to patient-care technology in hospitals and other health care institutions. The Clinical Engineering program provides a basic knowledge of the life and health sciences; training in the application of engineering principles to the clinical environment, patient-oriented technology, design and development, safety procedures; skills in administration and communication. The program consists of course work and practical experience in local hospitals.</p> <p><b>Prerequisite:</b> Graduation in Engineering. Students are advised to acquire a basic knowledge of biology, organic chemistry, systems and electronics before applying for entry. Students should consult the Director of the Clinical Engineering Program regarding eligibility for admission.</p> <p><b>Courses</b>  PHED 391 Human Anatomical Systems  BIOL 201 Cell Biology  COMM 329 Principles of Organization Behaviour  PATH 375 Introduction to Human Pathology  APSC 550 Biomedical Measurements and</p>



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<p>training in the application of engineering principles to the clinical environment, patient-oriented technology, design and development, safety procedures; and skills in administration and communication. The program consists of course work and a supervised project report on topics related to biomedical engineering.</p> <p><b>Degree Requirements</b></p> <p><b>Prerequisites</b> Undergraduate degree in Engineering.</p> <p>Students are advised to acquire a basic knowledge of biology, physiology, anatomy, organic chemistry, systems and electronics before applying for entry. Students should consult the Director of the Clinical Engineering Program regarding eligibility for admission.</p> <p><b>Courses</b></p> <p>PATH 375 (3) Introduction to Human Pathology APSC 550 (3) Biomedical Measurements and Biomaterials APSC 552 (1) Biomedical Engineering Seminar APSC 554 (6) Directed Studies in Biomedical Engineering APSC 556 (3) Clinical and Industrial Practice of Biomedical Engineering</p> <p>Plus 15 credits of approved graduate level courses in Engineering, Physics, Computer Science, Physiology, Health Sciences and Management, of which at least 9 credits must be courses in Engineering. A maximum of 6 credits in courses numbered 300 to 499 may be counted toward the requirements of a master's degree.</p> <p><b>Contact Information</b></p> <p>Biomedical Engineering Program 2360 East Mall Vancouver, BC, V6T 1Z3</p> <p><b>Tel:</b> 604-822-0367 <b>Fax:</b> 604-822-6003</p> <p><b>Email:</b> bme@apsc.ubc.ca <b>Web:</b> www.bme.ubc.ca</p> <p>Sylvia Cho, Graduate Secretary</p>	<p>Biomaterials APSC 552 Clinical Engineering Seminar APSC 554 Directed Studies in Clinical Engineering APSC 556 Clinical Engineering Practice Plus 13 credits of approved graduate level courses in Engineering, Physics, Computer Science, Physiology, Health Sciences and Management, of which at least 10 credits must be courses in Engineering. An additional 3 credits of approved 300, 400 or 500-level courses are required in Computer Systems, Data Management, Operations Research, or Systems Analysis.</p> <p><b>Action:</b> Reactivate program with minor revision to core requirements,</p> <p><b>Rationale:</b> The CLEN Master of Engineering program was discontinued in November 1994 due to budget cuts in the Faculty of Graduate Studies. Resources are now available from the Department of Chemical &amp; Biological Engineering and the Faculty of Applied Science.</p> <p>The revised Program Overview contains minor editorial changes that help clarify the program requirements.</p> <p>The original required course PHED 391 is now HKIN 190/191 and is deleted from the revised core requirement because 100-level courses are not acceptable for Graduate Studies requirements. The Prerequisites statement has included "physiology and anatomy" so that prospective students are required to possess a basic knowledge equivalent to that of the former PHED 391.</p> <p>BIOL 201 is deleted from the revised core requirement because APSC has already increased biology courses as either core courses or technical electives in most undergraduate engineering programs. Therefore, prospective students are required to have a basic knowledge equivalent to that of BIOL 201 as a prerequisite.</p> <p>PATH 375 also contains certain physiology and anatomy materials related to this field of study. As well, PATH 375 requires basic biology and chemistry as prerequisites. Therefore, moving</p>
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<p>Dr. Ezra Kwok, Director and Graduate Advisor</p>	<p>the contents of PHED 391 (HKIN 190/191) and BIOL 201 from the core courses to prerequisites is appropriate.</p> <p>COMM 329 is deleted from the revised core requirement and will be included as a technical elective because some undergraduate engineering programs have already increased contents in technical writing and communication skills.</p> <p>The overall credit requirement is 31 which is consistent with all other existing Master of Engineering degrees at UBC.</p> <p>The reactivation of this program is in conjunction with the initiative of the new Biomedical Engineering (BME) MSc and PhD programs. A thorough consultation process has been completed, resulting in strong support from all health-science and engineering units. The complete BME program proposal has been approved by the Graduate Council. Once the Master of Engineering in Clinical Engineering is re-activated, students will be able to select either the professional MEng degree or a research-based MSc or PhD degree in Biomedical Engineering.</p> <p><b>Document ID#:</b> CLEN G001(2)</p>
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