

EMO

Dean of  
Graduate Studies

Direct Address  
Laggie Benston  
Student Services Centre  
100  
Burnaby BC V5A 1S6  
Canada

Mailing Address  
388 University Drive  
Burnaby BC V5A 1S6  
Canada

**TO: Senate**

TEL

FROM Wade Parkhouse, Dean, Graduate Studies



RE Faculty of Applied Sciences

**[GS2012.06]**

CC Rob Cameron

DATE January 17, 2012

**For information**

Acting under delegated authority at its meeting of 16 January 2012, the SGSC approved the following curriculum revisions:

**Effective Date is September 2012****Faculty of Applied Sciences****[GS2012.06]**School of Engineering Science

Doctor of Philosophy Program:

- i) Changes to program requirements
- ii) Changes to description: ENSC 820-3 Engineering Management for Development Projects
- iii) Changes to title, description and addition of pre-requisite: ENSC 853-3 Digital CMOS Integrated Circuits

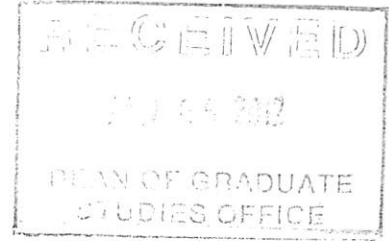
Senators wishing to consult a more detailed report of curriculum revisions may do so by going to DocuShare:

<https://docushare.sfu.ca/dsweb/View/Collection-12682>

If you are unable to access the information, please call [778-782-3168](tel:778-782-3168) or email [shelley\\_gair@sfu.ca](mailto:shelley_gair@sfu.ca).



FACULTY OF APPLIED SCIENCES



MEMO

Office of the Dean  
ASB-9861  
Applied Science Bldg  
Tel: 778-782-4724  
Fax: 778-782-5802  
www.fas.sfu.ca

<b>ATTENTION</b>	<b>Wade Parkhouse, Dean of Graduate Studies</b>
<b>FROM</b>	Rob Cameron, Associate Dean, Faculty of Applied Sciences
<b>RE</b>	Faculty of Applied Sciences Graduate Curriculum Changes
<b>DATE</b>	January 4, 2012

Please find enclosed the following graduate curriculum changes for the School of Engineering Science approved at the December 20, 2011 meeting of the Faculty of Applied Sciences Graduate Program Committee.

- ✓ 1. Change to the Engineering Science PhD program.

This change allows the course ENSC 820-3 to be used towards the PhD, but not towards the mandatory 6 credits of ENSC technical courses. This is documented with the memo entitled "Major Program Change" of December 2, 2011 as well as the consequent course change form for ENSC 820.

- ✓ 2. Update to the <sup>TITLE</sup> description and <sup>ADDITION OF</sup> prerequisite for ENSC 853.

Please place these items on the agenda of the next SGSC meeting.

Enclosures



MEMO

Simon Fraser University  
Burnaby Campus  
Applied Science Building  
Room 9851

Tel: 778-782-4371  
Fax: 778-782-4951  
www.ensc.sfu.ca

ATTENTION	SGSC
FROM	School of Engineering Science
RE	Major Program Change
DATE	December 2, 2011

1) **Statement here re: proposed program change:**

The School of Engineering Science would like to change the program requirements for the PhD program to include, ENSC 820-3 – Engineering Management for Development Projects, as an optional course for credit.

2) **Statement as to how this change will affect the existing programme:**

This change will be a benefit to doctoral students currently in the program, as we believe a project management course is an important component of the doctoral learning experience and that our PhD students should have the opportunity, and be encouraged, to take this course.

3) **Justification for change:**

This change will give the opportunity for our PhD students to take, for credit, a course that will provide managerial and reporting practices typical of engineering development projects.

4) **Current Calendar Language:**

Course Requirements

The minimum requirement is 18 units beyond that of the MASc degree. Six of these units will be for prescribed courses in the specialization in which the student is enrolled. Alternatives can be substituted with the approval of the student’s supervisory committee. At most, six units may be senior undergraduate courses. At most, six units may be directed studies. At least six units must be within engineering science, **although ENSC 820-3 may not be used towards these six units.** ~~except that~~



SCHOOL OF ENGINEERING SCIENCE

~~ENSC 820-3 may not be used toward the course requirement of the PhD degree.~~ Additional courses may be required to correct deficiencies in the student's background.

**5) Proposed Calendar Language:**

**Course Requirements**

The minimum requirement is 18 units beyond that of the MASC degree. Six of these units will be for prescribed courses in the specialization in which the student is enrolled. Alternatives can be substituted with the approval of the student's supervisory committee. At most, six units may be senior undergraduate courses. At most, six units may be directed studies. At least six units must be within engineering science, although ENSC 820-3 may not be used towards these six units. Additional courses may be required to correct deficiencies in the student's background.

A handwritten signature in black ink, consisting of several loops and a long horizontal stroke extending to the right.

**FROM:**

# Engineering Science Doctor of Philosophy Program

*School of Engineering Science | Faculty of Applied Sciences  
Simon Fraser University Calendar 2012 Spring*

## Course Requirements

The minimum requirement is 18 units beyond that of the MASc degree. Six of these units will be for prescribed courses in the specialization in which the student is enrolled. Alternatives can be substituted with the approval of the student's supervisory committee. At most, six units may be senior undergraduate courses. At most, six units may be directed studies. At least six units must be within engineering science, **although ENSC 820-3 may not be used towards these six units** ~~except that ENSC 820-3 may not be used toward the course requirement of the PhD degree.~~ Additional courses may be required to correct deficiencies in the student's background.

**TO:**

## Course Requirements

The minimum requirement is 18 units beyond that of the MASc degree. Six of these units will be for prescribed courses in the specialization in which the student is enrolled. Alternatives can be substituted with the approval of the student's supervisory committee. At most, six units may be senior undergraduate courses. At most, six units may be directed studies. At least six units must be within engineering science, although ENSC 820-3 may not be used towards these six units. Additional courses may be required to correct deficiencies in the student's background.

studies committee has been given.

### Course Requirements

The minimum requirement is 18 units beyond that of the MASC degree. Six of these units will be for prescribed courses in the specialization in which the student is enrolled. Alternatives can be substituted with the approval of the student's supervisory committee. At most, six units may be senior undergraduate courses. At most, six units may be directed studies. At least six units must be within engineering science, except that ENSC 820-3 may not be used toward the course requirement of the PhD degree. Additional courses may be required to correct deficiencies in the student's background. Change

### Previous Credit

If the subject matter of a listed course has been previously completed with graduate credit, the course may not be completed again for credit.

### Qualifying Examination

To qualify the student will submit a brief written research proposal and defend it orally to his/her supervisory committee within the first 24 months of admission. The proposal's defence will be judged according to the feasibility and scientific merits of the proposed research, and demonstration of a sophisticated understanding of general material in the student's major area of research. This level of understanding is associated with senior undergraduate and first year graduate course material.

The possible outcomes of the qualifying examination are 'pass,' 'marginal' and 'fail.' A student with 'marginal' will be required to re-submit the research proposal and defend it for the second and final time within six months and/or to complete more courses. A 'failing' grade requires withdrawal.

### Thesis

Students define and undertake original research, the results of which are reported in a thesis. An examining committee is formed as defined in graduate general regulation 1.9.3. Students conform to residence requirements (see graduate general regulation 1.7.3). The senior supervisor will be an engineering science faculty approved by the graduate program committee.

The student's progress will be reviewed every 12 months by a supervisory committee of three or more faculty members. At each annual review, the student presents a summary of his/her work to date, with the first review being the research proposal defence described in the section for Qualifying Examination (see above).



# Graduate Course Minor Change Form

This form is for an SFU department or program to request a minor change to an existing graduate course. After approval and signature by the faculty graduate studies committee, this form should be forwarded to the Dean of Graduate Studies for approval by the Senate Graduate Studies Committee (SGSC). SGSC will forward the approval to Senate for information.

## DEPARTMENT

Department / School / Program Engineering Science	Contact name Shawn Stapleton	Contact email shawn@sfu.ca
Please revise the following elements of the indicated graduate course: <input type="checkbox"/> Catalogue number <input type="checkbox"/> Units <input type="checkbox"/> Title <input checked="" type="checkbox"/> Description <input type="checkbox"/> Other: _____		

## CURRENT COURSE

Please complete only the fields to be changed.

Program (eg. ECON) ENSC	Number (eg. 810) 820	Units (eg. 4) 3
Course title (max 80 characters) Engineering Management for Development Projects		
Short title (appears on transcripts, max 25 characters)		
Course description for SFU Calendar <input type="checkbox"/> see attached This course focuses on the management and reporting activities of typical engineering development projects. Through seminars and workshops it builds the student's skills at estimating project cost and schedule, keeping a project on track, and handing over the completed project to a customer or another team. A writing workshop emphasizes techniques for writing proposals, and writing and controlling documentation. Note that ENSC 820 will not count towards the course work requirement of students enrolled in the MSc and PhD programs.		
Available course components <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Seminar <input type="checkbox"/> Laboratory <input type="checkbox"/> Practicum <input type="checkbox"/> Online <input type="checkbox"/> _____		
Grading basis <input checked="" type="checkbox"/> Graded <input type="checkbox"/> Satisfactory / Unsatisfactory <input type="checkbox"/> In Progress / Complete <input type="checkbox"/> _____		
Prerequisites (if any)		
This is combined with an undergrad course. <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
Course number and units: <del>ENSC 820-3</del>		
Additional course requirements for graduate students		

## REVISED COURSE

Please complete only the fields to be changed.

Program (eg. ECON) ENSC	Number (eg. 810) 820	Units (eg. 4) 3
Course title (max 80 characters) Engineering Management for Development Projects		
Short title (appears on transcripts, max 25 characters)		
Course description for SFU Calendar <input type="checkbox"/> see attached This course focuses on the management and reporting activities of typical engineering development projects. Through seminars and workshops it builds the student's skills at estimating project cost and schedule, keeping a project on track, and handing over the completed project to a customer or another team. A writing workshop emphasizes techniques for writing proposals, and writing and controlling documentation. Note that ENSC 820 will not count towards the course work requirement of students enrolled in the MSc program. ✓		
Available course components <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Seminar <input type="checkbox"/> Laboratory <input type="checkbox"/> Practicum <input type="checkbox"/> Online <input type="checkbox"/> _____		
Grading basis <input checked="" type="checkbox"/> Graded <input type="checkbox"/> Satisfactory / Unsatisfactory <input type="checkbox"/> In Progress / Complete <input type="checkbox"/> _____		
Prerequisites (if any)		
This is combined with an undergrad course. <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
Course number and units: <del>ENSC 820-3</del>		
Additional course requirements for graduate students		

## APPROVALS

ROBERT D. CAMERON  
Faculty graduate studies committee name  
W Parkhouse  
Senate graduate studies committee name

*R. Cameron*  
Signature  
*W Parkhouse*  
Signature

JAN. 4, 2012  
Date  
Jan 18/12  
Date

### **ENSC 820-3 Engineering Management for Development Projects**

This course focuses on the management and reporting activities of typical engineering development projects. Through seminars and workshops it builds the student's skills at estimating project cost and schedule, keeping a project on track, and handing over the completed project to a customer or another team. A writing workshop emphasizes techniques for writing proposals, and writing and controlling documentation. Note that ENSC 820 will not count towards the course work requirement of students enrolled in the MASc/and PhD programs. / *deleted.*





# Graduate Course Minor Change Form

This form is for an SFU department or program to request a minor change to an existing graduate course. After approval and signature by the faculty graduate studies committee, this form should be forwarded to the Dean of Graduate Studies for approval by the Senate Graduate Studies Committee (SGSC). SGSC will forward the approval to Senate for information.

## DEPARTMENT

Department / School / Program <b>Engineering Science</b>	Contact name <b>Marek Syrzycki</b>	Contact email <b>syrzycki@sfu.ca</b>
Please revise the following elements of the indicated graduate course: <input type="checkbox"/> Catalogue number <input type="checkbox"/> Units <input checked="" type="checkbox"/> Title <input checked="" type="checkbox"/> Description <input type="checkbox"/> Other: _____		

## CURRENT COURSE

Please complete only the fields to be changed.

Program (eg. ECON) <b>ENSC</b>	Number (eg. 810) <b>853</b>	Units (eg. 4) <b>3</b>
Course title (max 80 characters) <b>Digital Semiconductor Circuits and Devices</b>		
Short title (appears on transcripts, max 25 characters)		
Course description for SFU Calendar <input type="checkbox"/> see attached <b>MOS device electronics. Second Order Effects in MOS transistors. BJT device electronics. Static and transient analysis of inverters. Digital gates, circuits and circuit techniques. Speed and power dissipation. Memory systems. Gate arrays, semicustom and customized integrated circuits. CAD tools. Students are required to complete a project.</b>		
Available course components <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Seminar <input type="checkbox"/> Laboratory <input type="checkbox"/> Practicum <input type="checkbox"/> Online <input type="checkbox"/> _____		
Grading basis <input checked="" type="checkbox"/> Graded <input type="checkbox"/> Satisfactory / Unsatisfactory <input type="checkbox"/> In Progress / Complete <input type="checkbox"/> _____		
Prerequisites (if any) <b>none</b>		
This is combined with an undergrad course. <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
Course number and units: <del>ENSC 853-3</del>		
Additional course requirements for graduate students		

## REVISED COURSE

Please complete only the fields to be changed.

Program (eg. ECON) <b>ENSC</b>	Number (eg. 810) <b>853</b>	Units (eg. 4) <b>3</b>
Course title (max 80 characters) <b>Digital CMOS Integrated Circuits</b>		
Short title (appears on transcripts, max 25 characters)		
Course description for SFU Calendar <input type="checkbox"/> see attached <b>MOS FET transistors and models; CMOS technology evolution; basic digital cells in CMOS; static and dynamic logic circuits in CMOS; CMOS functional blocks (adders, multipliers, datapaths, ALUs); semiconductor memories (Read-Only Memories, Programmable Logic Arrays, programmable memories, static and dynamic Random Access Memories, flash memories); CMOS digital layout design and standard-cell based design; Low-power and low-voltage CMOS circuits; CMOS physical design in submicron technologies (interconnects, timing and power design issues). Basic CAD tools for CMOS integrated circuit design. Prerequisite: ENSC 850 or permission of the instructor.</b>		
Available course components <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Seminar <input type="checkbox"/> Laboratory <input type="checkbox"/> Practicum <input type="checkbox"/> Online <input type="checkbox"/> _____		
Grading basis <input checked="" type="checkbox"/> Graded <input type="checkbox"/> Satisfactory / Unsatisfactory <input type="checkbox"/> In Progress / Complete <input type="checkbox"/> _____		
Prerequisites (if any) <b>ENSC 850 or permission of the instructor</b>		
This is combined with an undergrad course. <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
Course number and units: <del>ENSC 853-3</del>		
Additional course requirements for graduate students		

## APPROVALS

ROBERT D. CAMERON  
Faculty graduate studies committee name  
C. Parkhouse  
Senate graduate studies committee name

[Signature]  
Signature  
[Signature]  
Signature

Jan. 4, 2012  
Date  
Jan 18/12  
Date

## **ENSC 853-3 Digital Semiconductor Circuits and Devices**

MOS device electronics. Second Order Effects in MOS transistors. BJT device electronics. Static and transient analysis of inverters. Digital gates, circuits and circuit techniques. Speed and power dissipation. Memory systems. Gate arrays, semicustom and customized integrated circuits. CAD tools. Students are required to complete a project.