UNDERGRADUATE EDUCATION COMMITTEE (UEC) MEETING
September 23, 2022 - 10:00 AM
A225

AGENDA
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1. APPROVAL OF THE AGENDA

2. APPROVAL OF UEC MINUTES

3 - 4 **2.1.** UEC draft minutes: August 30, 2022

MOTION: To approve the draft minutes as presented.

3. COURSES AND PROGRAMS

5 - 12 **3.1. Teacher Education**
Review with changes: EDUC 200
Review with changes including title: EDUC 300

MOTION: To approve the revised EDUC course outlines as presented.

13 - 44 **3.2. Engineering**
Changes including total hours: ENGR 210
Changes including title, credits, pre/corequisites, and total hours: ENPH 310
Changes including title, prerequisites, and pre/coreguisites: ENPH 320
Changes including title, prerequisites, and course code: ENPH 340 (formerly ENGR 340)
Changes including credits, prerequisites, and pre/coreguisites: ENPH 390\

Changes to entrance and program requirements: Engineering Physics diploma in Mechatronics

MOTION: To approve the ENGR and ENPH course outlines as presented.

MOTION: To recommend the changes to the Engineering Physics diploma in Mechatronics as presented, effective September 2023.

4. OTHER BUSINESS/DISCUSSION ITEMS
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45 **4.1. UEC Policy Subcommittee membership**

4.2. APPC report

4.3. Senate report

4.4. Senate Teaching and Learning Committee report

4.5. Policy Subcommittee report

5. INFORMATION ITEMS

46 **5.1. Student vacancy on UEC**

5.2. Program suspensions
Suspended for two years: Applied Ethical and Political Philosophy minor
Suspended for one year: Digital Manufacturing diploma

6. ADJOURNMENT

UNDERGRADUATE EDUCATION COMMITTEE (UEC) MEETING

August 30, 2022
10:00 AM - A225
Abbotsford Campus

DRAFT MINUTES

PRESENT:	Ian Affleck, Donna Alary, Courtney Boisvert, Claire Carolan, Carl Janzen, David Johnston, Selena Karli, Dana Landry, Catherine Liao, Samantha Pattridge, and Vanessa Radzimski
ABSENT:	Teresa Arroliga-Piper, Vlad Dvoracek, Shirley Hardman, Claire Hay, Bobby Jaswal, Nicholas Johnson, Amber Johnston, Randy Kelley, David McGuire, Sarbjot Nijjar, Linda Pardy, Ravneet Sohal, and Shel Stefan
GUESTS:	William Maher
RECORDER:	Amanda Grimson

1. APPROVAL OF AGENDA

2. APPROVAL OF UEC MINUTES

2.1. UEC draft minutes: June 17, 2022

MOTION:
To approve the draft minutes as presented.
CARRIED

3. DISCUSSION ITEMS

3.1. Review of UEC Terms of Reference and committee procedures

UEC's responsibilities, Senate guidelines for committee members, and procedures for membership on Senate standing committees were reviewed. Committee members were asked to review the Terms of Reference and bring any suggestions to the next meeting.

3.2. UEC Subcommittees

Terms of Reference for both the Screening Subcommittee and Policy Subcommittee were reviewed, and the addition of a PDQA representative to both subcommittees was further discussed.

It was noted that the Screening ToR do not include a purpose, which should be added. It may also be appropriate to consider renaming this subcommittee. The role and function of Campus-Wide Consultation (CWC) were discussed in relation to Screening, and a rubric for CWC was suggested

MOTION:
To add a PDQA representative to the UEC Screening Subcommittee membership.
CARRIED

Membership of the Policy Subcommittee will be finalized at the September meeting, as the faculty member that expressed interest in June was not present to confirm their continued interest.

MOTION:
To add a PDQA representative to the UEC Policy Subcommittee membership.
CARRIED

3.3. Course prerequisites

Registrar David Johnston reviewed the principles that should guide course prerequisites, as outlined in the Prerequisites and Co-Requisites Policy (84). Prerequisites are often designed for enrolment control rather than for student success. Although this is occasionally needed, enrolment can usually be managed through other means. When considering what is necessary for student success, it may also be useful for departments to look at how often prerequisites are waived for a particular course.

3.4. Official course outline common questions

The committee discussed some common questions that arise when reviewing course outlines, such as how field trip information is communicated to students. Of particular concern are field trips that are required outside of class time. While the timetable typically includes general notes about required field trips, specific details about timing and cost are not usually provided. Information about mandatory workshops, such as those that nursing students must take as part of Fraser Health requirements, should also be readily available to students.

4. INFORMATION

4.1. UEC Resources

- Program and Course Approval Procedures
- Approval processes and flowcharts
- Curriculum Quality Guidelines
- Course development
- Program changes
- New program development
- Integrated Strategic Plan

5. ADJOURNMENT

The meeting was adjourned at 11:35, followed by a workshop for committee members.

Memo for Course Changes

To: FPSCC/UEC

From: Sheryl MacMath, Co-chair BEd Program Review Committee

Date: March 9, 2022

Subject: Proposal for revision of EDUC 200: Educational Psychology

Note that even minor changes may result in comments from committees on all aspects of the course.

1. Summary of changes (select all that apply):
   - ☒ Six-year review
   - ☐ Number and/or course code
   - ☐ Credits and/or total hours
   - ☐ Title
   - ☒ Calendar description
   - ☐ Prerequisites and/or co-requisites
   - ☐ Frequency of course offering
   - ☒ Learning outcomes
   - ☒ Delivery methods and/or texts and resource materials
   - ☐ PLAR options, grading system, and/or evaluation methods
   - ☐ Discontinuation of course
   - ☐ Other – Please specify:

2. Rationale for change:

   As part of our 2021 – 2022 program review year (including our five-year maintenance review with the BC Teachers' Council), the Teacher Education Department has completed revisions for all official course outlines. As part of these revisions, all course outlines were updated to:
   - Conform to the new official course outline form as per UEC;
   - Ensure EDID (equity, diversity, inclusion, and decolonization) was referenced in the learning outcomes, course content, and course description;
   - Update course materials; and,
   - Ensure that current trends and research were represented.

3. If there are substantial changes to the learning outcomes, explain how they align with the learning outcomes of the program(s) and contribute to students' ability to meet the Institutional Learning Outcomes (ILOs):

   There were no substantial changes to the learning outcomes. This course already includes outcomes related to demonstrating information competency, analyzing critically and imaginatively, proficiently using knowledge and skills, initiating inquiries, communicating effectively, engaging in collaborative leadership, and engaging in collaborative leadership. As this is a course that develops the knowledge and skills for practicum in local schools, it also teaches students to contribute locally.

4. Is this course required by any program beyond the discipline? If so, how will this change affect that program or programs?

   No.

5. Which program areas have been consulted about the change(s)?

   None.

6. In what ways does this course (not just the proposed changes) contribute to Indigenizing Our Academy? Provide explicit examples of assignment design, topic selection, curriculum delivery, or other methods, which can be in response to one or more of the following: UFV Integrated Strategic Plan, Fulfilling Our Commitment to Aboriginal Peoples policy (BRP-200.05), the TRC Calls to Action, and/or the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP).
   - This course specifically references Indigenous ways of understanding education and psychology.
   - The course materials and content now include specific reference to non-Western and Indigenous ways of understanding development.
   - All of these changes specifically address the TRC calls to action #62 and 63.

7. How does the course reflect principles of equity, diversity, and inclusion, through assignment design, topic selection, curriculum delivery, or other methods?
   - This course specifically references understanding development from an inclusive lens that addresses all areas of EDID.

8. If applicable, discuss any special considerations for this course (credit value, class size limit, frequency of offering, resources required such as labs or equipment, field trips, etc.

   No changes.

9. Estimate of the typical costs for this course, including textbooks and other materials:

   $30 – 100 depending on texts.

UNIVERSITY OF THE FRASER VALLEY

ORIGINAL COURSE IMPLEMENTATION DATE: August 2004
REVISED COURSE IMPLEMENTATION DATE: January 2023
COURSE TO BE REVIEWED (six years after UEC approval)**:** September 2026
Course outline form version: 09/08/2021

OFFICIAL UNDERGRADUATE COURSE OUTLINE FORM

Note: The University reserves the right to amend course outlines as needed without notice.

Course Code and Number: EDUC 200	**Number of Credits:** 3 Course credit policy (105)
Course Full Title: Educational Psychology **Course Short Title:**	
Faculty: Faculty of Education, Community, and Human Development	**Department:** Teacher Education

Calendar Description:

Students are introduced to theories of learning and development and how these can be supported in educational settings. A decolonizing lens is used to critique and extend traditional theoretical conceptualizations of learning and development, including learning theories, motivation, and complex cognitive processes. These theories are then built upon to begin considering how inclusive and decolonizing learning environments might be structured to best meet the needs of all students.

Prerequisites (or NONE):	15 university-level credits.
Corequisites (if applicable, or NONE):	
Pre/corequisites (if applicable, or NONE):	

Antirequisite Courses *(Cannot be taken for additional credit.)*

Former course code/number:

Cross-listed with:

Equivalent course(s):

(If offered in the previous five years, antirequisite course(s) will be included in the calendar description as a note that students with credit for the antirequisite course(s) cannot take this course for further credit.)

Typical Structure of Instructional Hours

Lecture/seminar	35
Tutorials/workshops	10
Total hours	**45**

Scheduled Laboratory Hours

Labs to be scheduled independent of lecture hours: ☒ No ☐ Yes

Course Details

Special Topics course: **No**
(If yes, the course will be offered under different letter designations representing different topics.)

Directed Study course: **No**
(See policy 207 for more information.)

Grading System: **Letter grades**

Delivery Mode: **May be offered in multiple delivery modes**

Expected frequency: **Twice per year**

Maximum enrolment (for information only)**: 36**

Prior Learning Assessment and Recognition (PLAR)

PLAR is available for this course.

Transfer Credit *(See **bctransferguide.ca**.)*

Transfer credit already exists: **Yes**

Submit outline for (re)articulation: **No**
(If yes, fill in transfer credit form.)

Department approval	**Date of meeting:**	December 8, 2021
Faculty Council approval	**Date of meeting:**	May 6, 2022
Undergraduate Education Committee (UEC) approval	**Date of meeting:**	September 23, 2022

Learning Outcomes *(These should contribute to students' ability to meet program outcomes and thus Institutional Learning Outcomes.)*

Upon successful completion of this course, students will be able to:

1. Describe the holistic development of students (i.e., cognitive, emotional, physical, spiritual).
2. Create connections between Indigenous, Western, and superdiverse perspectives on learning and development.
3. Describe multiple perspectives on motivation and complex cognitive processes and how they interact with social contexts.
4. Discuss an area of educational psychology that has personal meaning and relevance.
5. Describe an inclusive community of learners that builds from the strengths of all students, including Indigenous students, students with dis/abilities, culturally and linguistically diverse students, LGBTQ2+ students, and superdiverse students.
6. Identify specific teaching strategies that support inclusion in classrooms.

Recommended Evaluation Methods and Weighting *(Evaluation should align to learning outcomes.)*

Assignments:	65%	Project:	35%		%
	%		%		%

Details: Assignments: 25% learning metaphor; 20% presentation; 20% group assignment

NOTE: The following sections may vary by instructor. Please see course syllabus available from the instructor.

Texts and Resource Materials *(Include online resources and Indigenous knowledge sources. Open Educational Resources (OER) should be included whenever possible. If more space is required, use the Supplemental Texts and Resource Materials form.)*

	Type	Author or description	Title and publication/access details	Year
1.	Textbook	Woolfolk, Winne, Perry	Educational psychology: Applications in Canadian classrooms.	2020
2.	Textbook	Archibald	Indigenous storywork	2008
3.	Online resource	Canadian Council on Learning	Redefining How Success is Measured	2007
4.	Article	Tremblay	Aboriginal Perspectives on Social-Emotional Competence in Early Childhood	2013
5.	Online resource	Nunavut Ministry of Education	Inuit Qaujimajatuqangit Education Framework (The Learning Continuum	2007

Course Content and Topics

- Western theories of learning, motivation, memory, and development
- Non-western, Indigenous, and decolonial views of learning and development
- Addressing the needs of superdiversity
- Applying knowledge to case studies

Part 1: Development

- Holistic understandings of development (e.g., physical literacy, social emotional development, neuroscience, Indigenous epistemologies)
- Theories of development (e.g., Piaget, Vygotsky, Kohlberg, Inuit Qaujimajatuqangit Education Framework)
- Contextual Influences (e.g., Indigenous Storywork, colonial impacts)

Part 2: Learning

- Diverse learning needs (including Indigenous students, students with dis/abilities, culturally and linguistically diverse students, LGBTQ2+ students, and superdiverse students)
- Theories of Learning (including Indigenous, behavioural, cognitive, social-cognitive perspectives)
- Connections between Indigenous (e.g., work of Archibald, Inuit Qaujimajatuqangit Education Framework, First Nations Lifelong Learning Model), Western (e.g., work of Vygotsky, Bandura, Bronfenbrenner, Piaget, Erikson, Kohlberg), and superdiverse perspectives on learning and development.
- Motivation (including colonial impacts on beliefs, self-perceptions, needs)
- Complex cognitive processes (e.g., metacognition, learning strategies, problem solving, and creativity as they relate to Indigenous epistemologies)
- Constructivism

Part 3: Educational Contexts

- Creating positive learning environments (e.g., building from decolonizing perspectives, SOGI modules, resilience, mindfulness, inclusion)
- Building from the strengths of every student (e.g., building community connections, working from Indigenous pedagogies)

Additional resources:

- Davidson and Davidson (2018) Potlatch as Pedagogy. Chapter 2 The Story of sk'ad'a (p. 11-22)
- Ng-A-Fook, N. with Donald, D. (2020). Fook in Conversation podcast, episode 1: Dr. Dwayne Donald (62 min) https://www.fookconversation.com/podcast/episode-1-dwayne-donald/

Memo for Course Changes

To: FPSCC/UEC

From: Sheryl MacMath, Co-chair BEd Program Review Committee

Date: March 10, 2022

Subject: Proposal for revision of EDUC 300: Best practices in teaching and learning

Note that even minor changes may result in comments from committees on all aspects of the course.

1. Summary of changes (select all that apply):
   - ☒ Six-year review
   - ☐ Number and/or course code
   - ☐ Credits and/or total hours
   - ☒ Title
   - ☒ Calendar description
   - ☐ Prerequisites and/or co-requisites
   - ☐ Frequency of course offering
   - ☒ Learning outcomes
   - ☒ Delivery methods and/or texts and resource materials
   - ☐ PLAR options, grading system, and/or evaluation methods
   - ☐ Discontinuation of course
   - ☐ Other – Please specify:

2. Rationale for change:

   As part of our 2021 – 2022 program review year (including our five-year maintenance review with the BC Teachers' Council), the Teacher Education Department has completed revisions for all official course outlines. As part of these revisions, all course outlines were updated to:
   - Conform to the new official course outline form as per UEC;
   - Ensure EDID (equity, diversity, inclusion, and decolonization) was referenced in the learning outcomes, course content, and course description;
   - Update course materials;
   - Ensure that current trends and research were represented; and,
   - The title was changed to remove the colonial hierarchy that is established with the term, "best practices." This part of the title was removed.

3. If there are substantial changes to the learning outcomes, explain how they align with the learning outcomes of the program(s) and contribute to students' ability to meet the Institutional Learning Outcomes (ILOs):

   There were no substantial changes to the learning outcomes. This course already includes outcomes related to demonstrating information competency, analyzing critically and imaginatively, proficiently

using knowledge and skills, initiating inquiries, communicating effectively, engaging in collaborative leadership, and engaging in collaborative leadership. As this is a course that develops the knowledge and skills for practicum in local schools, it also teaches students to contribute locally.

4. Is this course required by any program beyond the discipline? If so, how will this change affect that program or programs?

   No.

5. Which program areas have been consulted about the change(s)?

   None.

6. In what ways does this course (not just the proposed changes) contribute to Indigenizing Our Academy? Provide explicit examples of assignment design, topic selection, curriculum delivery, or other methods, which can be in response to one or more of the following: UFV Integrated Strategic Plan, Fulfilling Our Commitment to Aboriginal Peoples policy (BRP-200.05), the TRC Calls to Action, and/or the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP).

   - The course content and learning outcomes specifically reference Indigenous content and ways of knowing in line with the TRC's calls to action #62 and 63.

7. How does the course reflect principles of equity, diversity, and inclusion, through assignment design, topic selection, curriculum delivery, or other methods?

   - The course content and learning outcomes specifically reference EDID in relation to teaching and learning.

8. If applicable, discuss any special considerations for this course (credit value, class size limit, frequency of offering, resources required such as labs or equipment, field trips, etc.

   No changes.

9. Estimate of the typical costs for this course, including textbooks and other materials:

   $30 – 100 depending on texts.

UNIVERSITY OF THE FRASER VALLEY

ORIGINAL COURSE IMPLEMENTATION DATE: January 2005
REVISED COURSE IMPLEMENTATION DATE: January 2023
COURSE TO BE REVIEWED (six years after UEC approval)**:** September 2026
Course outline form version: 09/08/2021

OFFICIAL UNDERGRADUATE COURSE OUTLINE FORM

Note: The University reserves the right to amend course outlines as needed without notice.

Course Code and Number: EDUC 300	**Number of Credits:** 4 Course credit policy (105)
Course Full Title: Teaching and Learning Practices **Course Short Title:** Teaching & Learning Practices	
Faculty: Faculty of Education, Community, and Human Development	**Department:** Teacher Education

Calendar Description:

Provides opportunities for prospective teachers to start becoming reflective practitioners. Content includes Western, Indigenous, decolonial, and non-Western educational theories, research, and pedagogy. Topics include strategies of teaching, learning, assessment, classroom management, differentiation, school governance, and equity/inclusion. Includes school observations and/or case studies.

Note: Students should be aware that a Police Information Clearance (PIC) will be required. Please contact the department for details.

Prerequisites (or NONE):	None.
Corequisites (if applicable, or NONE):	
Pre/corequisites (if applicable, or NONE):	EDUC 200 and 75 university-level credits.

Antirequisite Courses *(Cannot be taken for additional credit.)*

Former course code/number:

Cross-listed with:

Equivalent course(s):

(If offered in the previous five years, antirequisite course(s) will be included in the calendar description as a note that students with credit for the antirequisite course(s) cannot take this course for further credit.)

Typical Structure of Instructional Hours

Lecture/seminar	30
Tutorials/workshops	20
Experiential (work-integrated learning)	10
Total hours	**60**

Scheduled Laboratory Hours

Labs to be scheduled independent of lecture hours: ☒ No ☐ Yes

Course Details

Special Topics course: **No**
(If yes, the course will be offered under different letter designations representing different topics.)

Directed Study course: **No**
(See policy 207 for more information.)

Grading System: **Letter grades**

Delivery Mode: **May be offered in multiple delivery modes**

Expected frequency: **Twice per year**

Maximum enrolment (for information only)**: 36**

Prior Learning Assessment and Recognition (PLAR)

PLAR is available for this course.

Transfer Credit *(See **bctransferguide.ca**.)*

Transfer credit already exists: **Yes**

Submit outline for (re)articulation: **No**
(If yes, fill in transfer credit form.)

Department approval	**Date of meeting:**	December 8, 2021
Faculty Council approval	**Date of meeting:**	May 6, 2022
Undergraduate Education Committee (UEC) approval	**Date of meeting:**	September 23, 2022

Learning Outcomes *(These should contribute to students' ability to meet program outcomes and thus Institutional Learning Outcomes.)*

Upon successful completion of this course, students will be able to:

1. Examine best practices from Western, non-Western, Indigenous, decolonial, and anti-racist theories in relation to education.
2. Explore personal beliefs and values through reflection and examination of educational cases.
3. Identify characteristics of the personal and methodological dimensions of the pedagogical relationship (among teachers, students, and curriculum).
4. Describe the intention and impact of public policies, prescribed curriculum, and pedagogy on schooling and education.
5. Examine personal values and beliefs about education, learning, teaching, schools, and communities.
6. Identify the influence values and beliefs have on teacher identity and practice.
7. Critique the theory and practice of different learning modalities to instructional methods of lesson design and assessment.

Recommended Evaluation Methods and Weighting *(Evaluation should align to learning outcomes.)*

Assignments:	40%	Field evaluation:	40%	Portfolio:	20%
	%		%		%

Details:

NOTE: The following sections may vary by instructor. Please see course syllabus available from the instructor.

Texts and Resource Materials *(Include online resources and Indigenous knowledge sources. Open Educational Resources (OER) should be included whenever possible. If more space is required, use the Supplemental Texts and Resource Materials form.)*

	Type	Author or description	Title and publication/access details	Year
1.	Textbook	Parkay, Vaillancourt, Stephens, Harris, Hughes, Gadanidis & Petrarca	Becoming a Teacher	2019
2.				
3.				
4.				
5.				

Required Additional Supplies and Materials *(Software, hardware, tools, specialized clothing, etc.)*

Course Content and Topics

- Issues in education
- Curriculum, learners, teachers, public policy
- Indigenization, anti-racism, equity, diversity, and inclusion practices in education
- Learning, assessment, classroom culture and management
- Learner preferences, the brain, and models of teaching and learning
  The reflective practitioner
- Respecting beliefs, relational methods, and reciprocal engagement
- Professional portfolio and evidence of growth
- Case study of the field

Memo for Course Changes

To: FATS CC, FATS FC, UEC

From: Lin Long, Department head, Physics

Date: Feb 14, 2022

Subject: Proposal for revision of ENGR 210 (Circuit Analysis)

Note that even minor changes may result in comments from committees on all aspects of the course.

1. Summary of changes (select all that apply):
   - ☐ Six-year review
   - ☐ Number and/or course code
   - ☒ Credits and/or total hours
   - ☐ Title
   - ☒ Calendar description
   - ☐ Prerequisites and/or co-requisites
   - ☐ Frequency of course offering
   - ☒ Learning outcomes
   - ☒ Delivery methods and/or texts and resource materials
   - ☐ PLAR options, grading system, and/or evaluation methods
   - ☐ Discontinuation of course
   - ☐ Other – Please specify:

2. Rationale for change:
   - ENGR 210 includes lectures and labs. Due to the nature of the topics covered in this course, 57 hours of lectures and 18 hours of labs were not enough to adequately address all the required materials. Both the instructors and students requested additional hours in this course so that more materials/topics could be covered, and more lab time available for hands-on training. As a result, we have increased the hours in both lectures (75 hours) and labs (30 hours), and to compensate for the additional time, the course credit has been increased to 5.
   - With the increase in experiments, the lab work portion is increased in the evaluation weighting.
   - The calendar description is re-arranged to be clearer and updated to reflect the added course contents.
   - The course contents and learning outcomes have been updated based on how the course has been and will be taught.
   - One textbook is added to give students options in reference book.
3. If there are substantial changes to the learning outcomes, explain how they align with the learning outcomes of the program(s) and contribute to students' ability to meet the Institutional Learning Outcomes (ILOs):

No substantial changes to the learning outcomes. There are some minor changes in re-wording and one added topic.

4. Is this course required by any program beyond the discipline? If so, how will this change affect that program or programs?

   No

5. Which program areas have been consulted about the change(s)?

   Not applicable

6. In what ways does this course (not just the proposed changes) contribute to Indigenizing Our Academy? Provide explicit examples of assignment design, topic selection, curriculum delivery, or other methods, which can be in response to one or more of the following: UFV Integrated Strategic Plan, Fulfilling Our Commitment to Aboriginal Peoples policy (BRP-200.05), the TRC Calls to Action, and/or the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP).

   This course aligns and contributions in several ways according to the First Peoples' Principles of Learning. The team-based labs give students significant hands-on training, which give them opportunity to share knowledge and approaches with each other and reflect on one's practice. The skills learned from the course allow students to work in real-world projects including working with Indigenous communities when such opportunities arise.

7. How does the course reflect principles of equity, diversity, and inclusion, through assignment design, topic selection, curriculum delivery, or other methods?

   This course attracts diverse students who are interested in electricity/electric circuits and power as well as improving their hands-on skills. Assignment design, topic selection, and curriculum delivery in this course are developed under the principles of equity, diversity, and inclusion. A significant portion of the grade is from labs (hands-on) and assignments (which allow time for reflection), so diverse strengths are enabled to excel.

8. If applicable, discuss any special considerations for this course (credit value, class size limit, frequency of offering, resources required such as labs or equipment, field trips, etc.

   Due to the limitation in lab space and equipment, the class size has to be limited to 18 students.

9. Estimate of the typical costs for this course, including textbooks and other materials:

   About $150

UNIVERSITY OF THE FRASER VALLEY

ORIGINAL COURSE IMPLEMENTATION DATE: September 2014
REVISED COURSE IMPLEMENTATION DATE: September 2023
COURSE TO BE REVIEWED (six years after UEC approval)**:** September 2028
Course outline form version: 09/08/2021

OFFICIAL UNDERGRADUATE COURSE OUTLINE FORM

Note: The University reserves the right to amend course outlines as needed without notice.

Course Code and Number: ENGR 210	**Number of Credits:** 5 Course credit policy (105)
Course Full Title: Circuit Analysis **Course Short Title:**	
Faculty: Faculty of Applied and Technical Studies	**Department (or program if no department):** Physics

Calendar Description:

Basic laws, current, voltage, power; DC circuits, network theorems, network analysis; transients, AC circuits, resonance, use and application of phasors and complex algebra in steady-state response; basic magnetic circuits, transformers; frequency response, Laplace transform, two-port networks.

Prerequisites (or NONE):	PHYS 112.
Corequisites (if applicable, or NONE):	
Pre/corequisites (if applicable, or NONE):	PHYS 221.

Antirequisite Courses *(Cannot be taken for additional credit.)*

Former course code/number:

Cross-listed with:

Equivalent course(s):

(If offered in the previous five years, antirequisite course(s) will be included in the calendar description as a note that students with credit for the antirequisite course(s) cannot take this course for further credit.)

Typical Structure of Instructional Hours

Lecture/seminar	75
Supervised laboratory hours (science lab)	30
Total hours	**105**

Scheduled Laboratory Hours

Labs to be scheduled independent of lecture hours: ☒ No ☐ Yes

Course Details

Special Topics course: **No**
(If yes, the course will be offered under different letter designations representing different topics.)

Directed Study course: **No**
(See policy 207 for more information.)

Grading System: **Letter grades**

Delivery Mode: **May be offered in multiple delivery modes**

Expected frequency: **Annually**

Maximum enrolment (for information only)**: 18**

Prior Learning Assessment and Recognition (PLAR)

PLAR is available for this course.

Transfer Credit *(See bctransferguide.ca.)*

Transfer credit already exists: **Yes**

Submit outline for (re)articulation: **Yes**
(If yes, fill in transfer credit form.)

Department approval	**Date of meeting:**	February 14, 2022
Faculty Council approval	**Date of meeting:**	April 14, 2022
Undergraduate Education Committee (UEC) approval	**Date of meeting:**	September 23, 2022

Learning Outcomes *(These should contribute to students' ability to meet program outcomes and thus Institutional Learning Outcomes.)*

Upon successful completion of this course, students will be able to:

1. Describe key circuit elements including resistors, capacitors, inductors, transformers, dependent and independent power sources.
2. State the fundamental laws (Kirchhoff's Laws) and theorems (Thevenin/Helmholtz's and Norton/Helmholtz's equivalences) needed for circuit design and analysis.
3. Analyze electrical circuits containing a variety of circuit elements using the basic laws, theorems, and techniques.
4. Solve circuit equations using software, such as MATLAB.
5. Calculate both steady state and transient responses in 1st and 2nd order circuits.
6. Analyze electric power in DC and AC circuits.
7. Analyze simple circuits in frequency domain.
8. Compare the theoretical results with measurements.

Recommended Evaluation Methods and Weighting *(Evaluation should align to learning outcomes.)*

Final exam:	40%	Assignments:	15%	Quizzes/tests:	25%
Lab work:	20%		%		%

Details:

NOTE: The following sections may vary by instructor. Please see course syllabus available from the instructor.

Texts and Resource Materials *(Include online resources and Indigenous knowledge sources. Open Educational Resources (OER) should be included whenever possible. If more space is required, use the Supplemental Texts and Resource Materials form.)*

	Type	Author or description	Title and publication/access details	Year
1.	Textbook	J.W. Nilsson and S.A. Riedel	Electric Circuits (E10)	2014
2.	Textbook	C.K. Alexander and M. Sadiku	Fundamentals of Electric Circuits	2017
3.				
4.				
5.				

Required Additional Supplies and Materials *(Software, hardware, tools, specialized clothing, etc.)*

None.

Course Content and Topics

- Basic circuit variables, simple resistive circuits
- Techniques of circuit analysis (nodal analysis, mesh analysis, source transformation, superposition, Thevenin and Norton theorem)
- Inductance, capacitance, and mutual inductance
- Response of first-order RL and RC circuits
- Natural and step responses of RLC circuits
- Sinusoidal steady-state analysis (phasors, nodal analysis, mesh analysis, source transformation, Thevenin and Norton theorem)
- Magnetically coupled circuits
- Basic concepts and performance characteristics of transformers
- Sinusoidal steady-state power calculations
- Frequency response
- Laplace transform
- Two-port network

Memo for Course Changes

To: FSCC, SFC, UEC

From: Lin Long, Department head, Physics

Date: Feb 14, 2022

Subject: Proposal for revision of ENPH 310 (Electronics)

Note that even minor changes may result in comments from committees on all aspects of the course.

1. Summary of changes (select all that apply):
   - ☐ Six-year review
   - ☐ Number and/or course code
   - ☒ Credits and/or total hours
   - ☐ Title
   - ☒ Calendar description
   - ☒ Prerequisites and/or co-requisites
   - ☐ Frequency of course offering
   - ☒ Learning outcomes
   - ☐ Delivery methods and/or texts and resource materials
   - ☒ PLAR options, grading system, and/or evaluation methods
   - ☐ Discontinuation of course
   - ☐ Other – Please specify:

2. Rationale for change:
   - ENPH 310 (Electronics) is normally taken by both physics and engineering students. With the Engineering Physics diploma program to be revised, PHYS 232 (Experimental Methods in Physics) will be an elective (rather than required) course. Adding ENGR 210 (Circuit Analysis) as pre/corequisite will allow engineering students to take ENPH 310.
   - ENPH 310 includes lectures and labs. Due to the nature of the topics covered in this course, 57 hours of lectures and 18 hours of labs were not enough to adequately address all the required materials. Both the instructors and students requested additional hours in this course so that more materials/topics could be covered, and more lab time available for hands-on training. As a result, we have increased the hours in both lectures (75 hours) and labs (30 hours), and to compensate for the additional time, the course credit has been increased to 5.
   - The LOs are updated to reflect the added course materials and activities.
   - With the increase in experiments, the lab work portion is increased in the evaluation weighting.
   - The calendar description is re-arranged to be clearer and updated to reflect the added course contents.

3. If there are substantial changes to the learning outcomes, explain how they align with the learning outcomes of the program(s) and contribute to students' ability to meet the Institutional Learning Outcomes (ILOs):

There is no change in learning outcomes.

4. Is this course required by any program beyond the discipline? If so, how will this change affect that program or programs?

   No

5. Which program areas have been consulted about the change(s)?

   Not applicable.

6. In what ways does this course (not just the proposed changes) contribute to Indigenizing Our Academy? Provide explicit examples of assignment design, topic selection, curriculum delivery, or other methods, which can be in response to one or more of the following: UFV Integrated Strategic Plan, Fulfilling Our Commitment to Aboriginal Peoples policy (BRP-200.05), the TRC Calls to Action, and/or the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP).

   This course aligns and contributions in several ways according to the First Peoples' Principles of Learning. It has significant hands-on training and practice, which give students opportunity to share knowledge and approaches with each other and reflect on one's practice. The skills learned from the course allow students to work in real-world projects including working with Indigenous communities when such opportunities arise.

7. How does the course reflect principles of equity, diversity, and inclusion, through assignment design, topic selection, curriculum delivery, or other methods?

   This course attracts diverse students who are interested in electronics and want to improve their hands-on skills. Assignment design, topic selection, and curriculum delivery are designed under the principle of equity, diversity, and inclusion. A significant portion of the grade is from labs (hands-on) and assignments (which allow time for reflection), so diverse strengths are enabled to excel.

8. If applicable, discuss any special considerations for this course (credit value, class size limit, frequency of offering, resources required such as labs or equipment, field trips, etc.

   Due to the limitation in lab space and equipment, the class size has to be limited to 18 students.

9. Estimate of the typical costs for this course, including textbooks and other materials:

   About $150.

CWC comments and responses:

- Is there a more descriptive title that could be used, rather than just "Electronics"?
  Yes, we can use "Microelectronics".

- How did the PHYS 232 pre/corequisite fit in previously?
  PHYS 232 (Experimental methods in physics) includes some course materials in basic electric circuits and focuses on experiments and data analysis, which help the students to succeed in ENPH 310.

UNIVERSITY OF THE FRASER VALLEY

ORIGINAL COURSE IMPLEMENTATION DATE: September 2014
REVISED COURSE IMPLEMENTATION DATE: September 2023
COURSE TO BE REVIEWED (six years after UEC approval)**:** September 2028
Course outline form version: 09/08/2021

OFFICIAL UNDERGRADUATE COURSE OUTLINE FORM

Note: The University reserves the right to amend course outlines as needed without notice.

Course Code and Number: ENPH 310	**Number of Credits:** 5 Course credit policy (105)
Course Full Title: Microelectronics **Course Short Title:**	
Faculty: Faculty of Applied and Technical Studies	**Department (or program if no department):** Physics

Calendar Description:

Time and frequency domain analysis of linear and nonlinear electronic circuits, biasing and small signal analysis of transistor amplifiers, operational amplifiers, feedback and stability of amplifiers, oscillators and active filters, digital circuits, D/A and A/D conversion, instrumentation.

Prerequisites (or NONE):	PHYS 221.
Corequisites (if applicable, or NONE):	
Pre/corequisites (if applicable, or NONE):	PHYS 232 or ENGR 210.

Antirequisite Courses *(Cannot be taken for additional credit.)*

Former course code/number:

Cross-listed with:

Equivalent course(s): **PHYS 332 and PHYS 342**

(If offered in the previous five years, antirequisite course(s) will be included in the calendar description as a note that students with credit for the antirequisite course(s) cannot take this course for further credit.)

Typical Structure of Instructional Hours

Lecture/seminar	75
Supervised laboratory hours (science lab)	30
Total hours	**105**

Scheduled Laboratory Hours

Labs to be scheduled independent of lecture hours: ☒ No ☐ Yes

Course Details

Special Topics course: **No**
(If yes, the course will be offered under different letter designations representing different topics.)

Directed Study course: **No**
(See policy 207 for more information.)

Grading System: **Letter grades**

Delivery Mode: **May be offered in multiple delivery modes**

Expected frequency: **Annually**

Maximum enrolment (for information only)**: 18**

Prior Learning Assessment and Recognition (PLAR)

PLAR is available for this course.

Transfer Credit *(See bctransferguide.ca.)*

Transfer credit already exists: **Yes**

Submit outline for (re)articulation: **Yes**
(If yes, fill in transfer credit form.)

Department approval	**Date of meeting:**	February 14, 2022
Faculty Council approval	**Date of meeting:**	April 14, 2022
Undergraduate Education Committee (UEC) approval	**Date of meeting:**	September 23, 2022

Learning Outcomes *(These should contribute to students' ability to meet program outcomes and thus Institutional Learning Outcomes.)*

Upon successful completion of this course, students will be able to:

1. Analyze existing analog and digital electronic circuits at the block level.
2. Design specific analog and digital electronic circuits at the block level.
3. Construct physical analog and digital circuits using individual electronic components.
4. Use D/A and A/D conversion proficiently.
5. Manage the devices, tools, and electronic components in a basic electronics laboratory.
6. Simulate electronic circuits using industry standard software tools.
7. Explain how various basic electronic components work at both a fundamental and a practical level.

Recommended Evaluation Methods and Weighting *(Evaluation should align to learning outcomes.)*

Final exam:	40%	Assignments:	15%	Quizzes/tests:	25%
Lab work:	20%		%		%

Details:

NOTE: The following sections may vary by instructor. Please see course syllabus available from the instructor.

Texts and Resource Materials *(Include online resources and Indigenous knowledge sources. Open Educational Resources (OER) should be included whenever possible. If more space is required, use the Supplemental Texts and Resource Materials form.)*

	Type	Author or description	Title and publication/access details	Year
1.	Textbook	Sedra / Smith	Microelectronic Circuits, 7e	2014
2.				
3.				
4.				
5.				

Required Additional Supplies and Materials *(Software, hardware, tools, specialized clothing, etc.)*

Course Content and Topics

- Signals and amplifiers
- Diodes and semiconductor physics
- Bipolar Junction Transistors
- MOS Field Effect Transistors
- Operational Amplifiers
- Integrated - circuit amplifiers
- Power amplifier
- Frequency response
- Digital circuits
- D/A and A/D conversion
- Filters and tuned amplifiers

Memo for Course Changes

To: FSCC, SFC, UEC

From: Lin Long, Department head, Physics

Date: Feb 14, 2022

Subject: Proposal for revision of ENPH 320 (Fundamentals of Digital Logic and Design)

Note that even minor changes may result in comments from committees on all aspects of the course.

1. Summary of changes (select all that apply):
   - ☐ Six-year review
   - ☐ Number and/or course code
   - ☐ Credits and/or total hours
   - ☒ Title
   - ☒ Calendar description
   - ☒ Prerequisites and/or co-requisites
   - ☐ Frequency of course offering
   - ☒ Learning outcomes
   - ☐ Delivery methods and/or texts and resource materials
   - ☐ PLAR options, grading system, and/or evaluation methods
   - ☐ Discontinuation of course
   - ☐ Other – Please specify:

2. Rationale for change:
   - The title (formerly "Electronics II") is changed to "Fundamentals of Digital Logic and Design" to reflect the course contents more closely.
   - The calendar description is re-arranged and updated to reflect the course contents being taught.
   - ENPH 320 (Fundamentals of Digital Logic and Design) covers mainly digital logic circuits, and previous instructors have determined that students do not actually require ENPH 310 (Electronics I: Analog) as a prerequisite, as students are able to succeed in ENPH 320 without analog electronics knowledge. Knowledge and programming skills in any of ENGR 153 (Structured programming for engineers), COMP 150 (Introduction in Programming), and COMP 152 (Introduction to Structured Programming) will prepare the students to take ENPH 320. Either ENGR 210 (Circuit Analysis) or PHYS 232 (Experimental Methods in Physics) will ensure the students have enough circuits/electronics knowledge and lab skills to succeed in this course.
   - The course contents and learning outcomes have been updated based on how the course has been and will be taught.

3. If there are substantial changes to the learning outcomes, explain how they align with the learning outcomes of the program(s) and contribute to students' ability to meet the Institutional Learning Outcomes (ILOs)

There are no substantial changes to the learning outcomes. There are only some minor changes in re-wording.

4. Is this course required by any program beyond the discipline? If so, how will this change affect that program or programs?

   No.

5. Which program areas have been consulted about the change(s)?

   Not applicable.

6. In what ways does this course (not just the proposed changes) contribute to Indigenizing Our Academy? Provide explicit examples of assignment design, topic selection, curriculum delivery, or other methods, which can be in response to one or more of the following: UFV Integrated Strategic Plan, Fulfilling Our Commitment to Aboriginal Peoples policy (BRP-200.05), the TRC Calls to Action, and/or the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP).

   This course aligns and contributions in several ways according to the First Peoples' Principles of Learning. It has significant labs and project portion. The students will demonstrate and present their projects where they share their approaches to solving problems in the projects, while peer feedback provides opportunities to reflect on one's practice. The project component also allows for students' creativity and thus they are able to pursue a personalized direction of learning.

7. How does the course reflect principles of equity, diversity, and inclusion, through assignment design, topic selection, curriculum delivery, or other methods?

   Assignment design, topic selection, and curriculum delivery in this course are developed under the principles of equity, diversity, and inclusion. The distribution of grades is across labs (experiential), assignments (reflective), project (creative) and testing, giving a variety of academic strength types of the opportunity to excel. This course attracts students who want to improve their hands-on skills and enjoy experiential learning. Team-based labs and projects incorporate peer feedback and students' reflecting on each other's work.

8. If applicable, discuss any special considerations for this course (credit value, class size limit, frequency of offering, resources required such as labs or equipment, field trips, etc.

   Due to the limitation in lab space and equipment, the class size has to be limited to 18 students.

9. Estimate of the typical costs for this course, including textbooks and other materials:

   About $150

CWC comment and response:

- Is there data to support the memo comment that students do not require ENPH 310 as a prerequisite?
  In the past, there were a few students from CIS who didn't take ENPH 310 but the instructor waived pre-requisite for them to register ENPH 320, and they succeeded in this course. An equivalent course in SFU's Engineering Physics degree, ENSC 252-4, only has one of the 1st year programming or computer science course as pre-requisite and doesn't have any analog electronics course as pre-requisite.

ORIGINAL COURSE IMPLEMENTATION DATE:	September 2014
REVISED COURSE IMPLEMENTATION DATE:	September 2023
COURSE TO BE REVIEWED (six years after UEC approval)**:**	September 2028

Course outline form version: 09/08/2021

OFFICIAL UNDERGRADUATE COURSE OUTLINE FORM

Note: The University reserves the right to amend course outlines as needed without notice.

Course Code and Number: ENPH 320	**Number of Credits:** 4 Course credit policy (105)
Course Full Title: Fundamentals of Digital Logic and Design **Course Short Title:** Digital Logic and Design	
Faculty: Faculty of Applied and Technical Studies	**Department (or program if no department):** Physics

Calendar Description:

Boolean algebra, encoders, decoders, shift registers, and asynchronous and synchronous counters together with timing considerations. Design of asynchronous circuits, synchronous sequential cirdcuits, and finite state machines. Karnaugh mapping techniques, state tables and diagrams, and introduction to programmable logic.

Prerequisites (or NONE):	One of (ENGR 153, COMP 150, or COMP 152).
Corequisites (if applicable, or NONE):	
Pre/corequisites (if applicable, or NONE):	ENGR 210 or PHYS 232.

Antirequisite Courses *(Cannot be taken for additional credit.)*

Former course code/number:

Cross-listed with:

Equivalent course(s): **PHYS 362 and PHYS 372**

(If offered in the previous five years, antirequisite course(s) will be included in the calendar description as a note that students with credit for the antirequisite course(s) cannot take this course for further credit.)

Typical Structure of Instructional Hours

Lecture/seminar	45
Supervised laboratory hours (science lab)	30
Total hours	**75**

Scheduled Laboratory Hours

Labs to be scheduled independent of lecture hours: ☒ No ☐ Yes

Course Details

Special Topics course: **No**

(If yes, the course will be offered under different letter designations representing different topics.)

Directed Study course: **No**

(See policy 207 for more information.)

Grading System: **Letter grades**

Delivery Mode: **May be offered in multiple delivery modes**

Expected frequency: **Annually**

Maximum enrolment (for information only)**: 18**

Prior Learning Assessment and Recognition (PLAR)

PLAR is available for this course.

Transfer Credit *(See bctransferguide.ca.)*

Transfer credit already exists: **Yes**

Submit outline for (re)articulation: **Yes**

(If yes, fill in transfer credit form.)

Department approval	**Date of meeting:**	February 14, 2022
Faculty Council approval	**Date of meeting:**	April 14, 2022
Undergraduate Education Committee (UEC) approval	**Date of meeting:**	September 23, 2022

Learning Outcomes *(These should contribute to students' ability to meet program outcomes and thus Institutional Learning Outcomes.)*

Upon successful completion of this course, students will be able to:

1. Analyze existing digital logic circuits.
2. Design digital logic circuits for use in specific tasks.
3. Construct electronic circuits using individual electronic components and field programmable gate arrays (FPGAs)
4. Simulate digital logic circuits using industry standard software.
5. Design and construct projects which synthesize numerous aspects of digital circuits.
6. Communicate to both a technical and non-technical audience the purpose, behaviour, and function of the project using authentic forms of the discipline.

Recommended Evaluation Methods and Weighting *(Evaluation should align to learning outcomes.)*

Final exam:	40%	Assignments:	15%	Quizzes/tests:	20%
Lab work:	15%	Project:	10%		%

Details:

NOTE: The following sections may vary by instructor. Please see course syllabus available from the instructor.

Texts and Resource Materials *(Include online resources and Indigenous knowledge sources. Open Educational Resources (OER) should be included whenever possible. If more space is required, use the Supplemental Texts and Resource Materials form.)*

	Type	Author or description	Title and publication/access details	Year
1.	Textbook	Morris Mano	Digital design, 6e	2017
2.				
3.				
4.				
5.				

Required Additional Supplies and Materials *(Software, hardware, tools, specialized clothing, etc.)*

Course Content and Topics

- Digital systems and binary numbers
- Boolean algebra and logic gates
- Combinational logic
- Sequential logic
- Registers and counters
- Analog/digital conversion
- Memory and programmable logic
- Digital design using different digital components
- Field Programmable Gate Arrays (FPGAs)

Memo for Course Changes

To: FSCC, SFC, UEC

From: Lin Long, Department head, Physics

Date: Feb 14, 2022

Subject: Proposal for revision of ENPH 340 (formerly ENGR 340), Microcontrollers and Embedded Systems

Note that even minor changes may result in comments from committees on all aspects of the course.

1. Summary of changes (select all that apply):
   - ☐ Six-year review
   - ☒ Number and/or course code
   - ☐ Credits and/or total hours
   - ☒ Title
   - ☒ Calendar description
   - ☒ Prerequisites and/or co-requisites
   - ☐ Frequency of course offering
   - ☒ Learning outcomes
   - ☒ Delivery methods and/or texts and resource materials
   - ☒ PLAR options, grading system, and/or evaluation methods
   - ☐ Discontinuation of course
   - ☐ Other – Please specify:

2. Rationale for change:
   - This course can normally be taken by both physics and engineering students. However, as upper level "ENGR" courses are not counted as Physics program upper-level credits, we felt this unfairly limited course options for physics students. Changing the course code to "ENPH" should help to alleviate this inequity. Furthermore, the prefix change will attract more physics students who want to improve their hands-on skills, but require more upper level credits towards their degree.
   - "Microcontrollers" has broader concepts and applications than "Micro-Processors". The title has been changed to "Microcontrollers and Embedded Systems" to reflect the evolving technology and the way the course is currently being taught.
   - The updates in the calendar description include some re-wording of the course contents and one added topic (basic concepts of sensors and actuators).
   - ENPH 320 (Fundamentals of Digital Logic and Design) will give students sufficient knowledge and lab/project skills for this course, so ENPH 310 (Electronics) is no longer needed as a prerequisite. COMP 150 (Introduction to Programming) or COMP 152 (Introduction to Structured Programming) is prerequisite for ENPH 320, so they are not needed as prerequisite for ENPH 340.

- The learning outcomes are updated to reflect the course contents being taught, and we have added one more content section (basic concepts of sensors and actuators). There was also some re-wording and re-grouping to make the LOs clearer. Also, as the HCS12 microcontroller is now discontinued, we have deleted it from the learning outcomes.
- The discontinuation of the HCS12 microcontroller has now pushed the ARM technology as one of the new mainstream microprocessors. Accordingly, textbooks are updated to match the new microcontroller.
- This course is lab/project oriented. The updates in the instructional hours (lectures and labs ratio) and evaluation methods/weighing reflect how the course has been taught, as well putting a higher emphasis on the experimental aspect of the course.
- There are some re-wording/regroupings in the course contents. The course contents have also been updated to reflect how the course is currently being taught, with one added topic (basic concepts of sensors and actuators).

3. If there are substantial changes to the learning outcomes, explain how they align with the learning outcomes of the program(s) and contribute to students' ability to meet the Institutional Learning Outcomes (ILOs):

   No major changes in learning outcomes. There are some minor updates in re-wording/regrouping and one added topic.

4. Is this course required by any program beyond the discipline? If so, how will this change affect that program or programs?

   No

5. Which program areas have been consulted about the change(s)?

   Not applicable

6. In what ways does this course (not just the proposed changes) contribute to Indigenizing Our Academy? Provide explicit examples of assignment design, topic selection, curriculum delivery, or other methods, which can be in response to one or more of the following: UFV Integrated Strategic Plan, Fulfilling Our Commitment to Aboriginal Peoples policy (BRP-200.05), the TRC Calls to Action, and/or the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP).

   In this course, the team-based labs/projects will provide students opportunities to share their knowledge/approaches to each other as well as to reflect on one's practice. The skills learned from the course allow students to work in real-world projects and practice including working with Indigenous communities when such opportunities arise.

7. How does the course reflect principles of equity, diversity, and inclusion, through assignment design, topic selection, curriculum delivery, or other methods?

   This course attracts students who are interested to improve their hands-on and problem-solving skills. The wide range of project options give diverse students flexibility and opportunities. The diverse curriculum delivery (lectures, labs, team work, project proposal/demonstration/presentations) facilitates students' success under the principles of equity, diversity, and inclusion.

8. If applicable, discuss any special considerations for this course (credit value, class size limit, frequency of offering, resources required such as labs or equipment, field trips, etc.

   Due to the limitation in lab space and equipment, the class size has to be limited to 18 students.

9. Estimate of the typical costs for this course, including textbooks and other materials:

   About $150

CWC comment and response:

- Suggest changing the Physics program to allow ENGR courses to be used, rather than changing the course code to ENPH.
  In UBC Physics degree program, PHYS 319 is a course on "Introduction to Embedded Systems Using Microcontrollers and the MSP430" and taken by physics students. So changing this course's title to "ENPH" will benefit physics students. We don't want to allow ENGR courses to be counted as Physics upper level credits because not all ENGR courses are suitable for physics program, such as, ENGR 330 (Automatic Control Systems) and ENGR 350 (Sensors and Actuators) are for engineering stream.

UNIVERSITY OF THE FRASER VALLEY

ORIGINAL COURSE IMPLEMENTATION DATE: September 2014
REVISED COURSE IMPLEMENTATION DATE: September 2023
COURSE TO BE REVIEWED (six years after UEC approval)**:** September 2028
Course outline form version: 09/08/2021

OFFICIAL UNDERGRADUATE COURSE OUTLINE FORM

Note: The University reserves the right to amend course outlines as needed without notice.

Course Code and Number: ENPH 340	**Number of Credits:** 4 Course credit policy (105)
Course Full Title: Microcontrollers and Embedded Systems **Course Short Title:** Microcontrollers & Embed Syst	
Faculty: Faculty of Applied and Technical Studies	**Department (or program if no department):** Physics

Calendar Description:

Introduction of the design and construction of microprocessor-controlled devices. Basic concepts of sensors and actuators. Introduction to embedded systems using microcontrollers. C and assembly language programming.

Note: Students with credit for ENGR 340 cannot take this course for further credit.

Prerequisites (or NONE):	ENPH 320.
Corequisites (if applicable, or NONE):	
Pre/corequisites (if applicable, or NONE):	

Antirequisite Courses *(Cannot be taken for additional credit.)*

Former course code/number: **ENGR 340**

Cross-listed with:

Equivalent course(s):

(If offered in the previous five years, antirequisite course(s) will be included in the calendar description as a note that students with credit for the antirequisite course(s) cannot take this course for further credit.)

Typical Structure of Instructional Hours

Lecture/seminar	21
Supervised laboratory hours (science lab)	54
Total hours	**75**

Scheduled Laboratory Hours

Labs to be scheduled independent of lecture hours: ☒ No ☐ Yes

Course Details

Special Topics course: **No**
(If yes, the course will be offered under different letter designations representing different topics.)

Directed Study course: **No**
(See policy 207 for more information.)

Grading System: **Letter grades**

Delivery Mode: **May be offered in multiple delivery modes**

Expected frequency: **Annually**

Maximum enrolment (for information only)**: 18**

Prior Learning Assessment and Recognition (PLAR)

PLAR is available for this course.

Transfer Credit *(See bctransferguide.ca.)*

Transfer credit already exists: **No**

Submit outline for (re)articulation: **Yes**
(If yes, fill in transfer credit form.)

Department approval	**Date of meeting:**	February 14, 2022
Faculty Council approval	**Date of meeting:**	April 14, 2022
Undergraduate Education Committee (UEC) approval	**Date of meeting:**	September 23, 2022

Learning Outcomes *(These should contribute to students' ability to meet program outcomes and thus Institutional Learning Outcomes.)*

Upon successful completion of this course, students will be able to:

1. Analyze the architecture of a microcontroller.
2. Describe arithmetic logic instructions and programs.
3. Describe advanced addressing modes, macros and modules.
4. Write programs using C and assembly language.
5. Explain basic concepts of sensors and actuators.
6. Describe interface with analog and digital I/O, timer/counter programming.
7. Design simple embedded systems.
8. Design and construct projects using a microcontroller, sensor(s), motor(s), and electronic components.
9. Communicate effectively with project collaborators about the concepts above.

Recommended Evaluation Methods and Weighting *(Evaluation should align to learning outcomes.)*

Assignments:	5%	Quizzes/tests:	10%	Final exam:	25%
Lab work:	30%	Project:	30%		%

Details:

NOTE: The following sections may vary by instructor. Please see course syllabus available from the instructor.

Texts and Resource Materials *(Include online resources and Indigenous knowledge sources. Open Educational Resources (OER) should be included whenever possible. If more space is required, use the Supplemental Texts and Resource Materials form.)*

	Type	Author or description	Title and publication/access details	Year
1.	Textbook	Edward H. Currie, David Van Ess	PSoC3/5 Reference Book	2010
2.	Textbook	Robert Ashby	Designer's Guide to the Cypress PSoC	2005
3.				
4.				
5.				

Required Additional Supplies and Materials *(Software, hardware, tools, specialized clothing, etc.)*

The necessary laboratory equipment will be provided to the students.

Course Content and Topics

1. Introduction to microprocessor systems
2. Microcontroller architectures
3. Assembly language programming
4. C programming for microcontrollers
5. Input/output ports and I/O interfacing
6. Arithmetic logic instructions and programs
7. Advanced addressing modes, macros, and modules
8. Interfacing with analog and digital I/O, timer/counter programming, and interrupts

Laboratory sessions include experiments on microprocessor-based hardware design; assembly and C language program development; programming and interfacing with I/O device; and sessions dedicated to the design and completion of a major laboratory project.

Memo for Course Changes

To: FSCC, SFC, UEC

From: Lin Long, Department head, Physics

Date: Feb 14, 2022

Subject: Proposal for revision of ENPH 390 (Mechatronics)

Note that even minor changes may result in comments from committees on all aspects of the course.

1. Summary of changes (select all that apply):
   - ☐ Six-year review
   - ☐ Number and/or course code
   - ☒ Credits and/or total hours
   - ☐ Title
   - ☒ Calendar description
   - ☒ Prerequisites and/or co-requisites
   - ☐ Frequency of course offering
   - ☒ Learning outcomes
   - ☐ Delivery methods and/or texts and resource materials
   - ☐ PLAR options, grading system, and/or evaluation methods
   - ☐ Discontinuation of course
   - ☐ Other – Please specify:

2. Rationale for change:
   - With both students and the instructor spending significant hours and efforts in the projects outside of the scheduled instructional hours, 3 credits did not properly account for this additional time. We believe that 4 credits for this course is more commensurate with the amount of time and work put by students.
   - This is a capstone project course which includes a wide range of project options each year. A more general description emphasizing the nature of the course in calendar description is more appropriate than giving specific project examples.
   - ENGR 153 (Structured Programming for Engineers) is equivalent to COMP 152. Adding ENGR 153 gives students more options. ENGR 330 (Automated Control Systems) won't be required for (the revised) Engineering Physics diploma, so it has been removed from the list of prerequisites. ENGR 151 (Computer-aided graphics) is now discontinued so it has been deleted from the pre/corequisites. Either PHYS 382 (Experimental Physics) and ENPH 320 (Fundamentals of Digital Logic and Design) will give students sufficient lab/project skills for this course. ENPH 310 (Electronics) or ENPH 340 (Microcontrollers and Embedded Systems) listed as pre/corequisites will normally be taken alongside ENPH 390, and should enhance student success in the projects.
   - A few learning outcomes have been added to reflect how the course is currently being taught, and are more inline with the nature of the course.

3. If there are substantial changes to the learning outcomes, explain how they align with the learning outcomes of the program(s) and contribute to students' ability to meet the Institutional Learning Outcomes (ILOs):

   No major changes in learning outcomes. There are a few learning outcomes added to reflect how the course is being taught.

4. Is this course required by any program beyond the discipline? If so, how will this change affect that program or programs?

   No

5. Which program areas have been consulted about the change(s)?

   Not applicable

6. In what ways does this course (not just the proposed changes) contribute to Indigenizing Our Academy? Provide explicit examples of assignment design, topic selection, curriculum delivery, or other methods, which can be in response to one or more of the following: UFV Integrated Strategic Plan, Fulfilling Our Commitment to Aboriginal Peoples policy (BRP-200.05), the TRC Calls to Action, and/or the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP).

   This is a team-based project-oriented course which provides students opportunities to share their knowledge/approaches to each other as well as to reflect on one's practice. There are options for the students to engage with local industry and community including Indigenous community to initiate and work on real-world projects, especially projects to benefit Indigenous lives and communities.

7. How does the course reflect principles of equity, diversity, and inclusion, through assignment design, topic selection, curriculum delivery, or other methods?

   The principles of diversity and inclusion are reflected in the students' freedom to design a project of their own initiative and creation, which allows them to draw on their own backgrounds, strengths, and interests. The principle of equity is supported through the teamwork required in the project. Students on a team will decide together how to allocate tasks based on each one's skills and interests, so that the work is distributed fairly and equitably.

8. If applicable, discuss any special considerations for this course (credit value, class size limit, frequency of offering, resources required such as labs or equipment, field trips, etc.

   Due to the limitation in lab space and equipment, the class size has to be limited to 18 students.

9. Estimate of the typical costs for this course, including textbooks and other materials:

   About $150

CWC comments and responses:

- Learning outcome #6: are advanced communication and professional skills being taught in this course?
  Advanced communication is not taught in this course, but the communication skills will be enhanced by working in a team, collaborating with local industry/community, and oral

presentations. Professional skills are not specifically taught in the course, but EGBC (Engineers and Geoscientists BC)'s "Ethics and Laws" document will be shared and self-studied by the students. The students' professional skills will be enhanced by conducting the projects with their team and working with local industry/community under supervision of their instructor. Also, professionalism will be assessed through their weekly reports/project performance/self and team's evaluations.

- Learning outcome #7: are problem solving and creative thinking skills being taught in this course, or just assessed?
  Problem solving and creative thinking skills are not specifically taught, however, their problem solving and creative thinking sills will be enhanced by initiating projects, designing/prototyping/trouble-shooting their projects under the supervision of their instructor. These skills will be assessed through their project presentations and demonstrations (without these skills, they would not be able to complete the project and pass the course).

UNIVERSITY OF THE FRASER VALLEY

ORIGINAL COURSE IMPLEMENTATION DATE: September 2014
REVISED COURSE IMPLEMENTATION DATE: September 2023
COURSE TO BE REVIEWED (six years after UEC approval)**:** September 2028
Course outline form version: 09/08/2021

OFFICIAL UNDERGRADUATE COURSE OUTLINE FORM

Note: The University reserves the right to amend course outlines as needed without notice.

Course Code and Number: ENPH 390	**Number of Credits:** 4 Course credit policy (105)
Course Full Title: Mechatronics **Course Short Title:**	
Faculty: Faculty of Applied and Technical Studies	**Department (or program if no department):** Physics

Calendar Description:

A guided, self-directed project course. Learn how to run a project from start to finish. Understand the problem and try to identify/maximize value and opportunity for innovation.

Note: Students with credit for ENGR 390 cannot take this course for further credit.

Prerequisites (or NONE):	One of (PHYS 382 or ENPH 320), and one of (ENGR 153, COMP 150, or COMP 152).
Corequisites (if applicable, or NONE):	
Pre/corequisites (if applicable, or NONE):	ENPH 310 or ENPH 340.

Antirequisite Courses *(Cannot be taken for additional credit.)*

Former course code/number: **ENGR 390**

Cross-listed with:

Equivalent course(s):

(If offered in the previous five years, antirequisite course(s) will be included in the calendar description as a note that students with credit for the antirequisite course(s) cannot take this course for further credit.)

Typical Structure of Instructional Hours

Lecture/seminar	5
Tutorials/workshops	70
Total hours	**75**

Scheduled Laboratory Hours

Labs to be scheduled independent of lecture hours: ☒ No ☐ Yes

Course Details

Special Topics course: **No**
(If yes, the course will be offered under different letter designations representing different topics.)

Directed Study course: **No**
(See policy 207 for more information.)

Grading System: **Letter grades**

Delivery Mode: **May be offered in multiple delivery modes**

Expected frequency: **Annually**

Maximum enrolment (for information only)**: 18**

Prior Learning Assessment and Recognition (PLAR)

PLAR cannot be awarded for this course because:

This is the capstone course for the diploma.

Transfer Credit *(See bctransferguide.ca.)*

Transfer credit already exists: **No**

Submit outline for (re)articulation: **[click to select]**
(If yes, fill in transfer credit form.)

Department approval	**Date of meeting:**	February 14, 2022
Faculty Council approval	**Date of meeting:**	April 14, 2022
Undergraduate Education Committee (UEC) approval	**Date of meeting:**	September 23, 2022

Learning Outcomes *(These should contribute to students' ability to meet program outcomes and thus Institutional Learning Outcomes.)*

Upon successful completion of this course, students will be able to:

1. Manage the design process as well as the documentation.
2. Propose, conceptualize, design, and demonstrate a significant project in physics and/or engineering.
3. Build creative solutions to real-world mechatronics problems.
4. Exhibit strong organizational skills as well as effective time and cost management by taking a project from the design phase through to its completion.
5. Collaborate, in both leadership and subordinate roles, in small teams to complete major projects.
6. Demonstrate advanced communication and professional skills.
7. Demonstrate hands-on, problem-solving, and creative thinking skills.

Recommended Evaluation Methods and Weighting *(Evaluation should align to learning outcomes.)*

Project:	100%	%	%
	%	%	%

Details:

Project evaluation includes project proposal (15%), weekly progress report (30%), project demonstration (10%), oral presentation (10%), professionalism (5%), and a short thesis (30%).

NOTE: The following sections may vary by instructor. Please see course syllabus available from the instructor.

Texts and Resource Materials *(Include online resources and Indigenous knowledge sources. Open Educational Resources (OER) should be included whenever possible. If more space is required, use the Supplemental Texts and Resource Materials form.)*

	Type	Author or description	Title and publication/access details	Year
1.				
2.				
3.				
4.				
5.				

Required Additional Supplies and Materials *(Software, hardware, tools, specialized clothing, etc.)*

Projects and materials designed/supplied by the instructor.

Course Content and Topics

1. Projects in physics, engineering, and computing.
2. Industry driven projects (such as agricultural technology and automation).
3. Community driven projects (such as medical device).
4. Student initiative driven projects.

Memo for Program Changes

To: FATS CC, FATS FC, UEC

From: Lin Long, Department head, Physics

Date: March 21, 2022

Subject: Program change Engineering Physics (Mechatronics) diploma

1. Summary of changes (select all the apply):

   ☐ Program revision that requires new resources
   ☒ Addition of new course options or deletion or substitution of a required course
   ☒ Change to the majority of courses in an approved program
   ☐ Change to the duration, philosophy, or direction of a program
   ☐ Addition of a new field of specialization, such as a concentration
   ☒ Change in requirements for admission
   ☒ Change in requirements for residency or continuance
   ☐ Change in admission quotas
   ☐ Change which triggers an external review
   ☐ Deletion of a program not included in the Program Discontinuance policy
   ☐ Other – Please specify:

2. Rationale for change(s):

   Since the existing program is an advanced diploma requiring first year university level of physics (PHYS 112 Electricity and Magnetism) and math (MATH 112), that is, 3 years of study after high school graduation, the admissible rate is not high, especially for the international students. The domestic applicants from high schools would go somewhere else after they realized they were not admissible. A significant number of international applicants withdrew from the program because they did not want to complete one year of upgrading in first year Physics and Math courses to meet the entrance requirements. Furthermore, two upper level engineering courses (ENGR 330 Automatic Control Theory, ENGR 350 Sensors and Actuators) and one physics course (PHYS 231 Thermodynamics) don't fit this two year diploma well as per the feedback from the students and the instructors in the program. In order to still maintain the learning outcomes of the diploma and give students sufficient hands-on training, majority of the Engineering Transfer Program courses are a good fit to this diploma.

   We consulted UFV International regarding the entrance requirements, the adoption of some Engineering Transfer Program courses into the diploma, and international student enrollments. UFV International is very positive and supportive on the proposed program changes. We consulted Academic advisors (specialized in STEM programs) regarding the entrance requirements, residency and graduation requirements. They gave us very valuable feedback and suggestions. We consulted the Work-Integrated Learning coordinator regarding the Co-op option. We won't add co-op option into this diploma program because of the timing challenges (students can only apply to the co-op

program after completing two semesters at a Canadian Post-Secondary Institution). Based on the above-mentioned rationale and consultation, we have made the following changes to the diploma.

- Deleted two upper-level engineering courses: ENGR 330 (Automatic control theory) which is important for an engineering degree but not important for a two-year diploma, and ENGR 350 (Sensors and actuators) which doesn't need to be a separate course in the diploma because some materials of sensors and actuators are already in the course ENPH 340 (Microcontrollers and embedded systems). This will address the challenge of hiring sessionals for the upper-level engineering courses: people with a P.Eng (registered Professional Engineer) and PhD (preferred) are hard to find.
- Deleted PHYS 231 (Thermodynamics): this course is very useful for a physics and/or engineering degree but not important for a two-year diploma.
- Increased lecture and lab hours in ENGR 210 (Circuit analysis) and ENPH 310 (Electronics) to allow sufficient hands-on training and experiential learning.
- Gave the option of either PHYS 381 (Mathematical physics) or PHYS 232 (Experimental methods in physics) in the diploma (previously both courses were required). PHYS 381 is crucial for a BSc majoring in Physics but PHYS 232 is more useful (than PHYS 381) if the students want to go to industry directly with only the diploma.
- Added some Engineering Transfer Program (ETP) courses (MATH 111/112, PHYS 111/112, ENGR 113/123/124/153) to allow more hands-on training as well as a solid foundation of math/physics/programming. Those courses are transferrable to some institutions with engineering degrees in BC. Therefore, this also allows students to ladder into an Engineering degree elsewhere.
- Deleted the elective course option due to the addition of above mentioned ETP courses.
- Updated the entrance requirements to prerequisites for MATH 111 (Calculus I)/PHYS 111 (Mechanics), and UFV standard English requirement for the Degree/Diploma level English language proficiency requirement to make the program accessible to a larger pool of students with a wider variety of backgrounds, therefore, to increase the enrolments.
- Residency is updated to include 200-level physics/engineering/engineering physics courses accordingly as per the changes in program entrance requirements and courses.
- Readmission is updated to align with UFV Undergraduate Continuance policy (92).

3. If program outcomes are new or substantially changed, explain how they align with the Institutional Learning Outcomes:

   N/A - The program outcomes remain the same.

4. What consideration has been given to indigenizing the curriculum?

   ENGR 123/124/210, PHYS 232, ENPH 310/320/340 include significant team-based experiments, course projects, and presentations which give students opportunity to share knowledge and

approaches with each other and reflect on one's practice. As a capstone project course, ENPH 390, it has options for the students to engage with local industry and community including Indigenous community to initiate and work on real-world projects, especially projects to benefit Indigenous lives and communities. The students will also be encouraged to conduct integrated work study with local industry/community including Indigenous community during their summer terms.

5. Will additional resources be required? If so, how will these costs be covered?

   No.

6. How will students be impacted? (Indicate the projected number of students impacted.) Is the change expected to increase/decrease enrolment in the program?

   No existing students will be impacted because this program is suspended for one year to allow all existing students to graduate. The new applicants prior to the program suspension have been contacted and offered other program options. The change in the diploma is expected to increase the enrolment of both domestic and international students in the program.

7. Does the number of required core or elective credits from the program-specific discipline change? If so, will this change the total number of courses to be offered within the discipline?

   The total number of required credits is increased (to 66 from 60-64) with the adoption of some ETP courses. But there is no change in the actual total number of courses.

8. Identify any available resources that will be used to accommodate the program changes. (Eg. seats in existing classes, conversion of sections, timetabling changes, deletion of courses, etc.)

   There may be a small increase in enrolments for Math 111/112, Phys 111/112, and there will be more students in ENGR 113/123/124/153 courses.

9. Is the number of required or elective courses from other disciplines in the program changing? If so, what is the estimated impact to enrolments in these courses? Provide a memo from the respective dean(s) of the impacted faculty to confirm if budgetary implications have been considered and addressed.

   The elective course option is deleted from the program. Since the enrolment in the program was small and there was a large diversity of elective courses, impact on each elective course is very little or none.

   The major change in the diploma will impact the enrolment (increase) in 1st year engineering courses which are within Physics department.

10. Provide a memo from the program's dean to confirm that budgetary implications of the proposed changes have been considered and will be addressed within the faculty budget.

    No budgetary implications.

Engineering Physics

ufv.ca/engineering

Engineering Physics diploma in Mechatronics

This is a~~n advanced~~ two-year diploma program in Engineering Physics, specializing in Mechatronics.

The program itself contains 6660~~–64~~ credits. The program is designed for students to go directly to the workplace, but also to ladder ~~the diploma up~~ to a UFV Bachelor of Science degree with a Physics major~~. or even to complete an~~Those completing the diploma may be eligible to transfer to an engineering degree at another institution.

Entrance requirements

B.C. secondary school graduation or equivalent.

1. English Studies 12 or English First Peoples 12 (or equivalent) with at grade of C plus (C+) or better
2. One of the following (see note 1)
    - A grade of A or better in Calculus 12
    - A grade of B or better in Principles of Math 12
    - A grade of B or better in Pre-Calculus 12

~~1. Prerequisite for MATH 111One of the following:~~

- ~~B- or better in PHYS 112 and B- or better in MATH 112~~
- ~~B- or better in PHYS 221~~

3. ~~Prerequisites for ENGL 105PHYS 111~~ Physics 12 with at grade of C or better (see note 2).

Transfer Applicants

~~**English requirement:** Applicants must meet the Degree/diploma-level English language proficiency requirement. For details on how this requirement may be met, see the **English language proficiency requirement** section of the calendar.~~

Completion of nine university-level credits with a minimum CGPA of 2.00 based on all university credits attempted. Applicants with 8 credits or less will be assessed based on their high school record.

~~2. Minimum CGPA of 2.00.~~

Notes

1) Students without the stated mathematics high school course may present the prerequisite for MATH 111 instead
2) Students without the stated physics high school course may present the prerequisite for PHYS 111 instead

When to apply

Applications are accepted for entrance to the Fall semester only. For application deadlines, see Specific intake application process.

How to apply

Apply online at ufv.ca/admissions/apply.

Basis for admission decision

Entrance to the program is limited and not all qualified applicants may be admitted. Qualified applicants who are not admitted due to space constraints will be offered a position in an alternate program.

~~on a first-come first-served basis; however, students must have met the above entrance requirements in order to be accepted into the program and therefore be able to access the reserved seats.~~

~~International students who do not have the stated prerequisite courses (or their transfer equivalent) will be considered for admission if suitability is determined by the department head in consultation with the Office of the Registrar. All students must meet the continuance level for the program.~~

~~Qualified students who are not admitted will be recorded on a wait list. When a seat is offered to a student, that student must accept the offer in a timely fashion or that seat will be offered to the next student on the wait list.~~

~~Applicants who do not meet the entrance requirements may be admitted to Qualifying Studies. If a student has already completed courses from the diploma prior to being accepted to the diploma, the Engineering Physics Diploma Committee (EPDC) will decide if this student should be accepted to the program (creating unfilled reserved seats in some courses) or if the student should be delegated to a wait list. Effective use of university resources can be a factor in the committee's decision.~~

Fees and additional costs

Information on tuition and mandatory fees may be found here.~~International students will pay the current UFV international student semester rate (see International Tuition & Fees) for four semesters. Domestic students will pay the standard rate (see the Fees and Other Costs section).~~

Books and additional supplies for the Engineering Physics diploma in Mechatronics ~~could~~ cost approximately $50-200 per course.

Program duration

The Engineering Physics diploma in Mechatronics is normally completed within two years ~~in duration~~ of full-time study. ~~However, students meeting the program requirements over a longer time period will also be allowed to graduate.~~ Students are assumed to take ~~at least four~~required program courses per semester for the four semesters of the diploma. Due to the strict sequence of the courses, the students are strongly recommended to see an academic adviser before the registration.

Location

Most courses are offered in Abbotsford. Courses occasionally may also be offered at the Chilliwack ~~and Mission~~ campus~~es~~. One course, ENGR 100 (Production in Practice) is only offered at the Chilliwack campus Trades and Technology Centre.

Program outline

~~It is recommended that students take the following required course before the start of the program:~~

~~Course~~	~~Title~~	~~Credits~~
~~COMP 150~~	~~Introduction to Programming~~	~~4~~
~~or~~ ~~COMP 152~~	~~Introduction to Structured Programming~~	~~-~~

The following are the courses required for the program, as well as a ~~sample~~ schedule of how the courses will normally be taken.

Semester I (Fall): 1~~6~~4 credits

Course	Title	Credits
~~ENGR 210~~MATH 111	~~Circuit Analysis~~Calculus I	4
~~MATH 211~~PHYS 111	~~Calculus III~~Mechanics	~~3~~5
~~PHYS 221~~ENGR 153	~~Intermediate Mechanics (see Note)~~Structured Programming for Engineers	~~4~~3
~~PHYS 231~~ENGR 123	~~Thermodynamics~~Engineering Design I	~~3~~4

~~Note: Students with credit for ENGR 113, ENGR 152/MATH 152, and ENGR 255/MATH 255 are not required to take PHYS 221.~~

Semester II (Winter): 1~~7~~3 ~~–14~~ credits

Course	Title	Credits
~~ENPH 310~~MATH 112	~~Electronics I~~Calculus II	4
~~PHYS 232~~PHYS 112	~~Experimental Methods in Physics (see Note)~~Electricity and Magnetism	~~3~~5
~~ENGR 257/ PHYS 381/ MATH 381~~ENGR 113	~~Mathematical Physics~~Statics and Dynamics	~~3~~4

~~Plus:~~ENGR 124	~~One course from the Elective options tables below~~Engineering Design II	~~3–~~4

~~Note: Students who completed PHYS 232 as a two-credit course should note that this diploma requires a minimum of 60 credits, and select their electives accordingly.~~

Semester III (Fall): ~~15–~~17 credits

Course	Title	Credits
ENGR 100	Production in Practice (see Note 1)	1
ENPH 320	~~Electronics II~~Fundamentals of Digital Logic and Design	4
ENGR ~~330~~210	~~Automatic Control Systems~~Circuit Analysis	~~4~~5
~~Plus:~~MATH 211	~~Two courses from the Elective options tables below~~Calculus III	~~6–8~~3
PHYS 221	Intermediate Mechanics (see Note 2)	4

Note 1: Although ENGR 100 is listed as a Fall course (students register for it in Fall), it will be offered at the end of the previous Summer semester (late August).

Note 2: Students with credit for all of ENGR 113, ENGR 152/MATH 152, and ENGR 255/MATH 255 are not required to take PHYS 221.

Semester IV (Winter): ~~14–15~~16 credits

Course	Title	Credits
ENPH~~GR~~ 340	Micro~~C~~controllers~~Processors~~ and Embedded Systems (formerly ENGR 340)	4
EN~~GR~~PH ~~350~~310	~~Sensors and Actuators~~EMicroelectronics	~~4~~5
ENPH 390	Mechatronics (formerly ENGR 390)	~~3~~4
~~Plus:~~Either PHYS 232 or PHYS 381/MATH 381/ENGR 257	~~One course from the Elective options tables below~~Experimental Methods in Physics or Mathematical Physics (see Note)	3–~~4~~

~~**Elective courses**~~

~~Students must choose four elective courses from the tables below. Additional electives may be accepted upon approval by the Engineering Physics Diploma Committee.~~

Note: For students completing the **diploma only**, ~~the electives on the following list are~~PHYS 232 is recommended~~:~~. For students pursuing both the **diploma and Physics major**, PHYS 381 is recommended.

Course	Title	Credits
One of:		3
CMNS 125	Communicating Professionally to Academic and Workplace Audiences (see Note 1)	-
CMNS 235 or higher	Any CMNS course numbered 235 or higher (see Note 1)	-
ENGL 105	Academic Writing (see Note 1)	-
Plus:		-
ENGR 113	Engineering Physics — Statics & Dynamics	4
ENGR 152/ MATH 152	Linear Algebra for Engineering (see Note 2)	3–4
or MATH 221	Linear Algebra (see Note 2)	-
MATH 270/ STAT 270	Introduction to Probability and Statistics	4
PHYS 225	Waves and Introductory Optics	3
PHYS 325	Fluid Mechanics	3
PHYS 382	Modern Physics Laboratory I	3
PHYS 393	Computational Physics I	3
PHYS 402	Advanced Optics	3
PHYS 408	Special Topics in Physics	3

Note 1: Only one CMNS course or ENGL 105 may be counted as an elective.

Note 2: Only one of MATH 152/ENGR 152 or MATH 221 may be counted as an elective.

The electives on the following additional list are accepted for the diploma, but are only recommended for students pursuing both the **diploma and Physics major**:

Course	Title	Credits
COMP 155	Object-oriented Programming	4
MATH 255/ ENGR 255	Ordinary Differential Equations	3

~~PHYS 311~~	~~Statistical Physics~~	~~3~~
~~PHYS 312~~	~~Intermediate Electromagnetism~~	~~3~~
~~PHYS 321~~	~~Advanced Mechanics~~	~~3~~
~~PHYS 351~~	~~Quantum Mechanics~~	~~3~~
~~PHYS 412~~	~~Advanced Electromagnetism~~	~~3~~
~~PHYS 455~~	~~Solid State Physics~~	~~3~~
~~PHYS 481~~	~~Advanced Mathematical Methods of Physics~~	~~3~~

Program continuance

To remain in the program, students must maintain a minimum GPA of 2.00, calculated on all courses applied to the diploma.

~~Student who drop below the minimum GPA will have one semester to rectify the problem. The EPDC may grant exceptions under extenuating circumstances.~~

Undergraduate continuance

Students enrolled in undergraduate courses (courses numbered 100 or above) must maintain an undergraduate Cumulative Grade Point Average (CGPA) of at least 2.00 to remain enrolled in Good Academic Standing at UFV. Students in Good Academic Standing will have no registration limits placed on them. Failure to meet the minimum CGPA requirement will result in restrictions on registration and may eventually lead to academic suspension from undergraduate studies at UFV. Students on Academic Warning or Academic Probation are limited to registering in 10 credits. For further details, see the Academic standing and undergraduate continuance section of the academic calendar. Academic standing is governed by UFV's Undergraduate Continuance policy (92).

Course repetition

Students may not register for a course more than twice without permission~~No course in the program can be taken more than twice~~. No more than four 200-level or above course duplications will be permitted on courses which apply to the diploma. Students with more than four 200-level or above course duplications will not be able to graduate from the program. Where a course has been repeated, only the higher grade is counted in the GPA calculation.

Readmission

Students who have been required to withdraw from UFV under the **Undergraduate Continuance policy (92)** are subject to readmission and continuance requirements as listed in the UFV academic calendar. Students are normally only readmitted once to the same program. ~~Readmission to the program is not guaranteed. Space must be available in the courses the student needs. The EPDC may choose to readmit a student who has achieved a minimum semester GPA of 2.00 in a semester in which the student took at least nine credits of courses.~~

Residency

In addition to the standard UFV residency requirements, students must complete ENGR 100 and ENPH 390 (formerly ENGR 390), plus four of the required ~~upper~~200-level or above ~~(300- or 400-level)~~ Physics, Engineering, or Engineering Physics courses, at UFV ~~(not including elective courses)~~.

Graduation requirements

Students are responsible for ensuring they are eligible to ~~graduate, and~~graduate and should regularly consult with an Academic Advisor. To be eligible to graduate, students must have completed all required courses ~~and the four electives~~ with a minimum GPA of 2.00, calculated on all the program courses.

~~It is possible for a student to take all courses in the program without being admitted to the program if seats reserved for diploma students were released for general admission and taken by the student. It is also possible that a student who failed to meet continuance requirements could complete the courses without meeting the readmission requirements. In these cases the committee would determine if the student has successfully completed the graduation requirements as described above and recommend the student for graduation.~~

Students must apply for graduation in the first month of their final semester of studies. Visit the Graduation webpage for more information.

~~Students must apply for graduation by completing the Graduation Request form available at ufv.ca/registrar/forms, or from the Office of the Registrar. This should be done in the first month of the final semester. The final deadline for students who wish to attend the June Convocation ceremony is April 1 of each year, with all program requirements completed by the Winter semester grade deadline (see Important Registration Dates) of each year.~~

Maximum length of time to complete program

The diploma is designed to be completed in two years, and if a student is unable to complete it in that time frame there is no guarantee that there will be space in the needed courses. All courses must be completed within five years of the start of the program.

Course listings

For complete details on courses see the course descriptions section.

Return to main Engineering page

UEC POLICY SUBCOMMITTEE

The UEC Policy Subcommittee is a subcommittee of the Undergraduate Education Committee.

PURPOSE

The purpose of the subcommittee is to suggest new policies or revisions to policies that fall under Items 2 and 4 of the UEC Terms of Reference:

> 2. Advise Senate on policies, procedures, and criteria for the admission, evaluation, withdrawal, and promotion of undergraduate students.
>
> 4. Advise Senate on policies and procedures for review and approval of new and existing courses, programs, or curricular changes.

TERMS OF REFERENCE

1. Review Senate Governance Committee requests for policy reviews.
2. Consult with relevant stakeholders where necessary to draft policy revisions.
3. Bring policy drafts to UEC for discussion, approval, or recommendation to Senate.
4. Identify policies in need of revision and propose policy reviews when appropriate.
5. Initiate policy reviews when directed by UEC to do so.

COMPOSITION

Membership

- One UEC Chair
- Registrar (or designate)
- University Secretary (or designate)
- Two UEC Faculty members*
- One UEC Advisor*
- One IR representative
- One PDQA representative
- One Dean
- One UEC at large member*

* Two-year term, renewable.

As needed, the committee will consult specific areas (International Education, Graduate Studies Committee, Continuing Education, specific disciplinary or Faculty areas not otherwise included in the committee, etc.)

MEMO

To: Chair, Undergraduate Education Committee

Date: September 2, 2022

Re: Student Vacancy on UEC

The Secretariat office has confirmed that Sarbjot Nijjar, a student member, is no longer enrolled at UFV as of September 2022 and therefore not eligible to serve on the Undergraduate Education Committee.

The Secretariat will make a call to fill this position, starting as soon as possible, for the remainder of a two-year term, until July 31, 2024.

1