Physics for Modern Technology: Bachelor of Science Major

Faculty of Science and Horticulture	kpu.ca/science
Implementation Date	01-Sep-2014
Start Date(s)	September January May
Intake Type	Open intake
Instructional Cycle	Semester-based
Program Type	Undergraduate
Credential Granted	Baccalaureate Degree
Offered At	Richmond Surrey
Format	Full-time Part-time
How to Apply	www.kpu.ca/admission

DESCRIPTION

The B.Sc. Major in Physics for Modern Technology will give students a solid background in physics and also in the applications of physics to modern technology. The program has been designed with the needs of local high-tech industry in mind and will equip students to work in a wide variety areas including (but not limited to):

- Green Energy Technology
- Industrial Process Control
- Electronics
- Robotics
- Technical Sales
- Teaching

In order to ensure students' future success in the workplace, the program includes a work placement and business courses.

Please Note: Most first year courses in this program are offered on both the Surrey and Richmond campuses. However, the second, third, and fourth year physics courses required for the degree are offered on the Richmond campus.

ADMISSION REQUIREMENTS

Students pursuing a major in Physics for Modern Technology must be admitted to the Faculty of Science & Horticulture.

DECLARATION REQUIREMENTS

Students intending to graduate with this Faculty of Science and Horticulture degree must declare the credential by the time they complete 60 credits of undergraduate coursework. At the time of declaration, the student must satisfy all of the following requirements:

- In good academic standing with the University
- Completion of a minimum of 24 credits of undergraduate coursework, including the following:
  - 3 credits of ENGL at the 1100 level or higher
  - PHYS 1102 with a minimum grade of “C” or PHYS 1220 with a minimum grade of “C”
  - MATH 1220 with a minimum grade of “C” or MATH 1230 with a minimum grade of “C”

CURRICULAR REQUIREMENTS

General Requirements

All students must complete the following general requirements for a Bachelor of Science:

- A minimum of 120 credits and a minimum of 40 courses (at least 3 credits each) at the post-secondary level (numbered 1100 or higher).
- At least 45 of the credits (15 courses) must be at the 3000- or 4000-level; at least 9 of these credits must be at the 4000-level.
- A minimum of 18 credits of breadth electives (see Electives) including:
  - at least one 3000- or 4000-level course; and
  - at least 12 credits from fields or courses not regarded as science; and
  - a maximum of 6 credits may come from fields of science not already included in the Physics for Modern Technology Major requirements.
- A minimum of a passing grade (D or better) in all courses counting towards the BSc, with a cumulative GPA of 2.0.

To meet residency requirements, at least 50% of all courses for the BSc, and at least 66% of upper level courses for the BSc, must be completed at KPU.

Physics for Modern Technology Major

In addition to the General Requirements, students must complete the following courses.

YEAR 1

Semester 1

All of:

CHEM 1110	The Structure of Matter	4 credits
ENGL 1100	Introduction to University Writing	3 credits
PHYS 1600	Introduction to Modern Technology	3 credits

And one of:

MATH 1120	Differential Calculus (recommended)	3 credits
MATH 1130	Calculus for Life Sciences I	3 credits

And one of:

PHYS 1101	Physics for Life Sciences I	4 credits
PHYS 1120	Physics for Physical and Applied Sciences I (recommended)	4 credits

Semester 2

All of:

BIOL 1110	Introductory Biology I	4 credits

CHEM 1210	Chemical Energetics and Dynamics	4 credits

And one of:

MATH 1220	Integral Calculus	3 credits
MATH 1230	Calculus for Life Sciences II	3 credits

And one of:

PHYS 1102	Physics for Life Sciences II	4 credits
PHYS 1220	Physics for Physical and Applied Sciences II (recommended)	4 credits

And:

One Breadth Elective (see Electives)		3 credits

YEAR 2

Semester 3

All of:

MATH 2721	Complex Numbers and Linear Algebra	3 credits
PHYS 2010	Modern Physics	3 credits
PHYS 2100	Experimental Physics	3 credits
PHYS 2420	Intermediate Electricity and Magnetism	3 credits
One Breadth Elective (see Electives)		3 credits

Semester 4

All of:

MATH 2821	Multivariate and Vector Calculus	3 credits
PHYS 2030	Classical Mechanics	3 credits
PHYS 2040	Thermal Physics	3 credits
PHYS 2600	Electronics with Microcontrollers	3 credits
PHYS 2610	Sensors and Actuators	3 credits

YEAR 3

Semester 5

All of:

CHEM 2315	Analytical Chemistry	4 credits
PHYS 3610	Introduction to Control (under development)	3 credits
PHYS 3900	Project in Physics & Technology (under development)	3 credits
PHYS 4800	Special Topics I (under development)	3 credits
One Business Elective (see Electives)		3 credits

Semester 6

Semester 6 includes work experience. The remainder of courses will be taken in compressed mode, January to February, in order to make the period from March through August available for work placement. The exact starting date will be determined in consultation with the work experience host.

All of:

PHYS 3620	Process Control (under development)	3 credits
PHYS 3700	Signal and Image Processing	3 credits
PHYS 3710	Applied Optics and Optoelectronics (under development)	3 credits
PHYS 3950	Work Experience - Part I	3 credits
PHYS 3951	Work Experience - Part II	3 credits

YEAR 4

Semester 7

All of:

CHEM 4610	Instrumental Analysis (under development)	4 credits
PHYS 4600	Programming for Instrumentation (under development)	3 credits
PHYS 4801	Special Topics II (under development)	3 credits
Two Breadth Electives (see Electives)		6 credits

Semester 8

All of:

PHYS 4010	Quantum and Solid State Physics (under development)	3 credits
PHYS 4700	Spectroscopic Instrumentation (under development)	3 credits
PHYS 4900	Senior Project in Physics & Technology (under development)	3 credits
One Breadth Elective (see Electives)		3 credits
One Business Elective (see Electives)		3 credits

Electives

As part of the major program, students are required to complete 15 credits of Breadth Electives as well as 6 credits of Business Electives.

BREADTH ELECTIVES

Breadth electives must be selected from subject areas outside of Physics. No more than six of these credits may be from the sciences.

BUSINESS ELECTIVES

At least six credits (two courses) must be selected in consultation with Physics faculty to meet Business Elective requirements. Courses must be selected from:

- Accounting (ACCT) – any course other than ACCT 1130 or ACCT 1230
- Business & Quantitative Methods (BUQU) – any course other than BUQU 1130 or BUQU 1230

- Business (BUSI) – any course other than BUSI 1204 or BUSI 1209
- Marketing (MRKT) – any course

CREDENTIAL AWARDED

Upon successful completion of the major program students are eligible to receive a **Bachelor of Science**. Transcripts will indicate a **Major in Physics for Modern Technology**.