

- What are the opportunities at Ryerson University,
Toronto?
 - At Physics Department
 - Master and PhD programs
- In Bioclinical Optics and Photonics Research Group?

Prepared and conducted by Alexandre (Sasha) Douplik
(Ryerson University, Toronto, Canada)

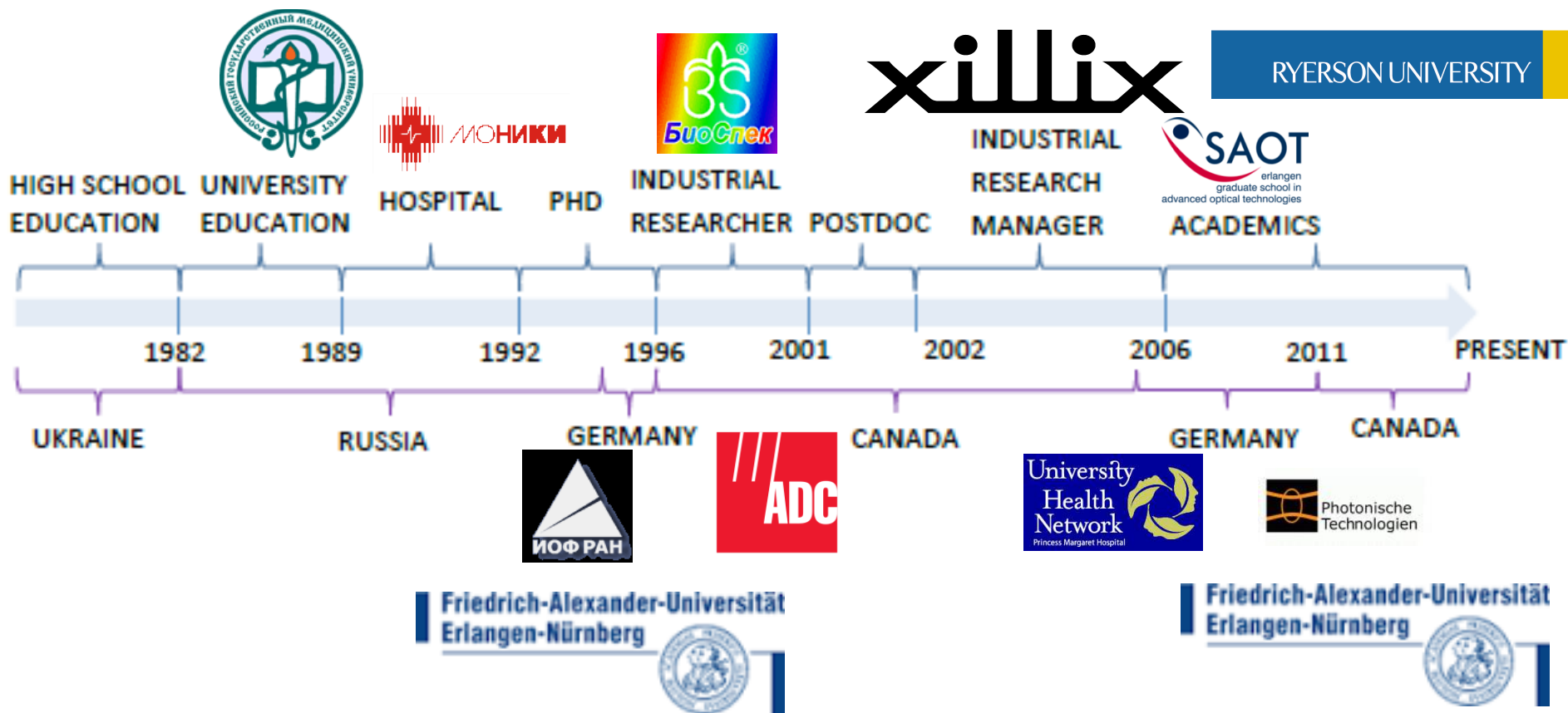
Affiliations

Associate Professor
Ryerson University,
Toronto
T: 416-979-5000
F: (416)-979-5343
douplik@ryerson.ca

Residential Scientist
Keenan Research
Centre
LKS Knowledge
Institute
St. Michael Hospital,
Toronto

Guest Professor
Clinical Photonics Lab
Erlangen Graduate School in
Advanced Optical Technologies (SAOT)
Friedrich-Alexander Universität Erlangen-
Nürnberg
Paul-Gordan-Straße 6
91052 Erlangen, Germany
E-mail: alexandre.douplik@fau.de

About the lecturer: carrier timeline



About the lecturer: education

INSTITUTION AND LOCATION	DEGREE	YEAR(s)	FIELD
Engineering Faculty, Friedrich-Alexander-University of Erlangen-Nuremberg (FAU), Erlangen, Germany	Dr. of Science (Habilitation)	2007-2011	Biomedical Engineering
General Physics Institute of Russian Academy of Science, Moscow, Russia & University of Erlangen-Nuremberg (FAU), Erlangen, Germany	PhD	1992-1996	Medical Biophysics
Technical Faculty/Medical Biophysics Department of Russian State Medical University, Moscow, Russia	MSc	1982-1989	Medical Physics and Radiology

University of Erlangen-Nuremberg, Bavaria, Germany



The university was founded in 1742

- 26.000 Students
- 260 Chairs
- 24 Clinics

- Medical faculty
- Engineering faculty
- ...

Erlangen is the residence of Head Office of Siemens

Some graduates:

- Georg Ohm (1789–1854), physicist, Ohm's law, named after him
- Ludwig Feuerbach (1804–1872), philosopher
- Hans Geiger (1882-1945), physicist, Geiger counter
- Karlheinz Banderburg (1954–), developer of the MP3 audio codec



Toronto, Ontario



Dundas Square, Toronto



Ryerson University



Ryerson University at a Glance

- The university has more than 38,000 students, including 2,300 master's and PhD students – a culturally diverse student population from 146 countries.
- The university employs 780 faculty and 1,700 administrative staff.
- Ryerson offers more than 100 undergraduate, master's and PhD programs.
- 95.3% of Ryerson graduates report employment two years after graduation.

Ryerson University: Faculties

- Faculty of Arts
- Faculty of Communication & Design
- Faculty of Community Services
- Faculty of Engineering and Architectural Science
- Faculty of Science
- Ted Rogers School of Management

Bachelor of Science Faculty of Science

Undergraduate Science Programs

- Biology
- Biomedical Science
- Chemistry
- Medical Physics
- Undeclared Science
- Computer Science
- Mathematics and Its Applications
- Financial Mathematics

Grade 12 U Subject Requirements:

- English (ENG4U) / Anglais (EAE4U)
- Advanced Functions (MHF4U)
- **Two of:** Biology (SBI4U), Chemistry (SCH4U) or Physics (SPH4U)

Grade 12 U Subject Requirements:

- English (ENG4U)/ Anglais (EAE4U)
- Advanced Functions (MHF4U)
- **One of:** Calculus and Vectors (MCV4U) or Mathematics of Data Management (MDM4U)
- **One of:** Biology (SBI4U) or Chemistry (SCH4U) or Physics (SPH4U)

Biology (SBI4U) is strongly recommended for Biology students, Chemistry (SCH4U) is strongly recommended for Chemistry students, and Physics is recommended for all Bachelor of Science programs.

Faculty of Science

Programs	Averages	Intake numbers
Biology	80%	170
Biomedical Science	85%	140
Chemistry	79%	60
Computer Science	79%	215
Financial Mathematics	78%	40
Mathematics & Its Application	78%	40
Medical Physics	78%	45
Undeclared	78%	75

Faculty of Science

www.ryerson.ca/science

- Biology
- Biomedical Science
- Chemistry
- Computer Science
- Financial Mathematics
- Mathematics and its Applications
- Medical Physics
- Science Undeclared

1st YEAR

1st SEMESTER

Common to Biology, Chemistry, and Medical Physics - both Co-operative and Regular Programs

REQUIRED:

[BLG 143](#) Biology I

[CHY 103](#) General Chemistry I

[CPS 118](#) Introductory Programming for Scientists

[MTH 131](#) Modern Mathematics I

[PCS 120](#) Physics I

[SCI 180](#) * Orientation

*This course is graded on a pass/fail basis.

2nd SEMESTER

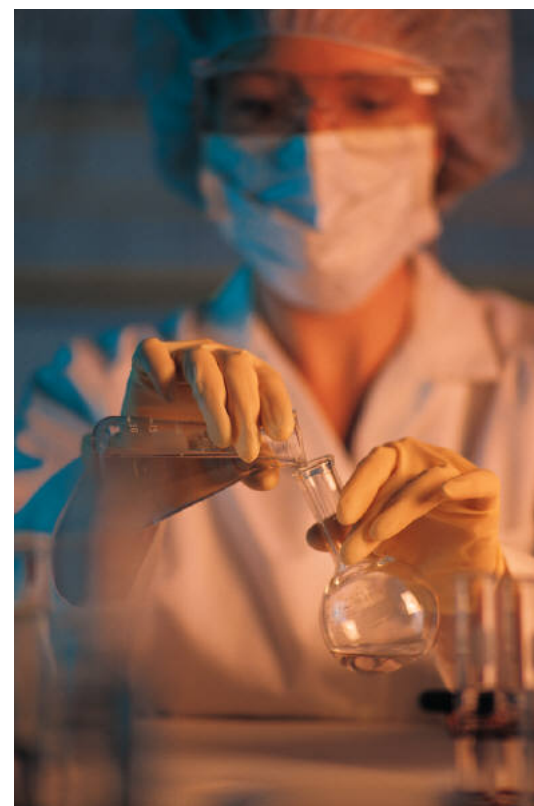
[BLG 144](#) Biology II

[CHY 113](#) General Chemistry II

[MTH 231](#) Modern Mathematics II

[PCS 130](#) Physics II

LIBERAL STUDIES: One course from [Table A](#).



BIOMEDICAL SCIENCE

1st SEMESTER

REQUIRED:

[BLG 143](#) Biology I

[CHY 103](#) General Chemistry I

[MTH 131](#) Modern Mathematics I

[PCS 120](#) Physics I

LIBERAL STUDIES: One course from [Table A](#).

[SCI 180](#) * Orientation

2nd SEMESTER

REQUIRED:

[BLG 144](#) Biology II

[CHY 113](#) General Chemistry II

[PCS 130](#) Physics II

ELECTIVE

[PSY 102](#) Intro to Psychology I



Computer Science

1st SEMESTER

[CPS 109](#) Computer Science I

[MTH 110](#) Discrete Mathematics I

[MTH 207](#) Calculus and Computational Methods I

REQUIRED GROUP 1: One course from the following:

[BLG 143](#) Biology I

[CHY 103](#) General Chemistry I

[PCS 110](#) Units and Vectors

LIBERAL STUDIES: One course from [Table A](#).

2nd SEMESTER

REQUIRED:

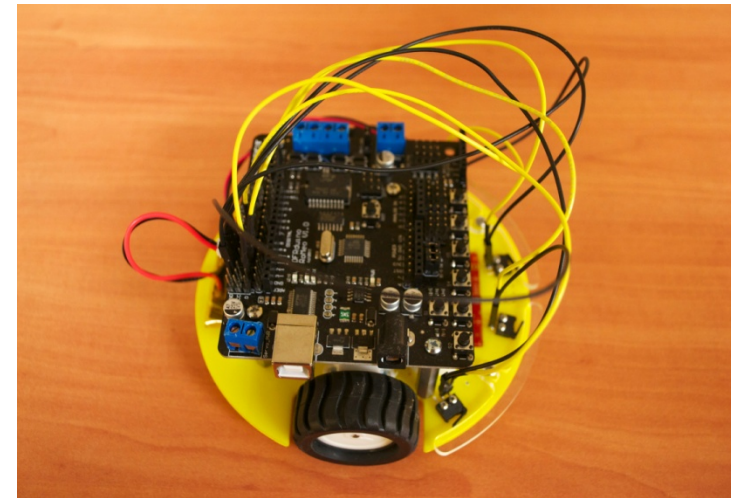
[CPS 209](#) Computer Science II

[CPS 393](#) Introduction to C and UNIX

[MTH 210](#) Discrete Mathematics II

[MTH 310](#) Calculus and Computational Methods II

LIBERAL STUDIES: One course from [Table A](#).



Mathematics and Its Applications

1st SEMESTER

REQUIRED:

[MTH 110](#) Discrete Mathematics I

[MTH 207](#) Calculus and Computational Methods I

SCIENCE I - REQUIRED GROUP 1: One course from the following:

[BLG 143](#) Biology I

[CHY 103](#) General Chemistry I

[PCS 110](#) Units and Vectors

[CPS 118](#) Introductory Programming for Scientists

LIBERAL STUDIES: One course from [Table A](#).

[SCI 180](#) * Orientation

2nd SEMESTER

REQUIRED:

[MTH 210](#) Discrete Mathematics II

[MTH 310](#) Calculus and Computational Methods II

SCIENCE II - REQUIRED GROUP 1: One course from the following:

[BLG 144](#) Biology II

[CHY 113](#) General Chemistry II

[PCS 130](#) Physics II

ELECTIVE

LIBERAL STUDIES: One course from [Table A](#).



Financial Mathematics

Starting Fall 2013

1st SEMESTER (Common to both Co-operative and Regular Program)

REQUIRED:

- [MTH 207](#) Calculus and Computational Methods I
- ACC 110 Financial Accounting
- [CPS 118](#) Introductory Programming for Scientists
- [ECN 104](#) Introductory Microeconomics
- [SCI 180](#) * Orientation (This course is graded on a pass/fail basis).

REQUIRED Group 1: One course from the following;

- [BLG 143](#) Biology I
- [CHY 103](#) General Chemistry I
- [PCS 120](#) Physics I

2nd SEMESTER

REQUIRED:

- [MTH 310](#) Calculus and Computational Methods II
- [FIN 300](#) Managerial Finance I
- [CMN 279](#) Introduction to Professional Communication

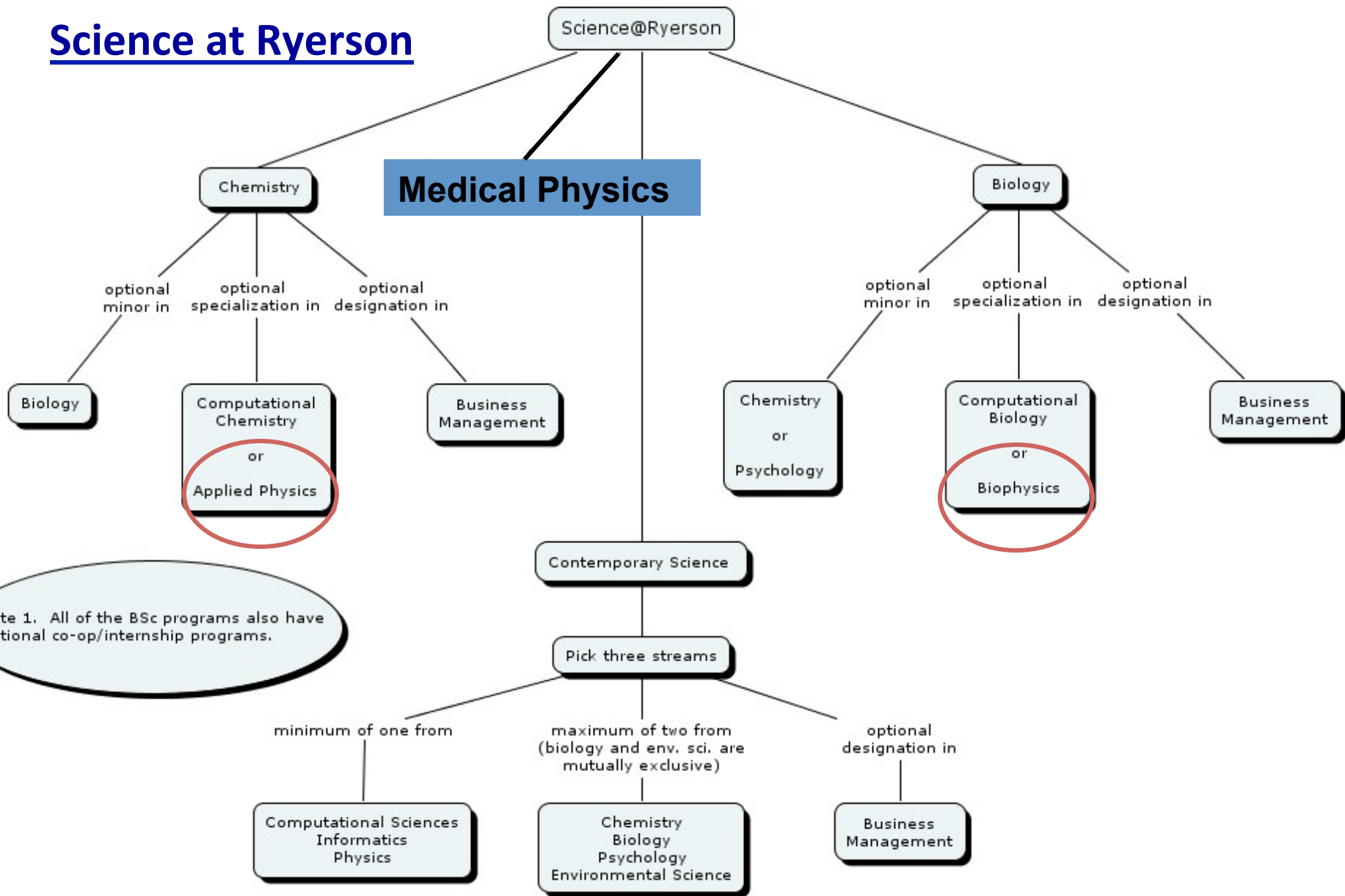
REQUIRED Group 2: One course from the following

- [BLG 144](#) Biology II
- [CHY 113](#) General Chemistry II
- [PCS 130](#) Physics II

LIBERAL STUDIES: One course from [Table A](#).



Science at Ryerson



Note 1. All of the BSc programs also have optional co-op/internship programs.

Upper Level Courses in Medical Physics

Second Year	Third Year	Fourth Year
<ul style="list-style-type: none"> • Statistics I • Intro to Medical Physics • Organic Chemistry I • Geometry & Calculus • Modern Physics • Biophysics • Photonics & Optical devices • Differential Equations • Quantum I • Liberal electives 	<ul style="list-style-type: none"> • Physiology • Nuclear physics / Radiation Protection • Cell biology • Anatomy • Electricity & Magnetism • Numerical Analysis • Thermodynamics and Statistical Physics • Modeling in Med. Phys. • Professional elective • 2 Liberal elective 	<ul style="list-style-type: none"> • Radiation Biology • Medical Imaging • 2 Professional electives • Image Analysis • Physiology • 2 Liberal electives • Medical Physics Thesis (two terms)

Co-Op in Medical Physics

YEAR 1			YEAR 2			YEAR 3			YEAR 4			YEAR 5		
F	W	S	F	W	S	F	W	S	F	W	S	F	W	S
1	2		3	4	WKT 1	5	WKT 2	WKT 3	WKT 4	6	WKT 5	7	8	

Preparation for 1st Co-op Work Term

Our students are eligible to graduate with a B.Sc. (Co-Operative Education) degree (an option of the program) if they are successfully completed five or four co-op work terms;

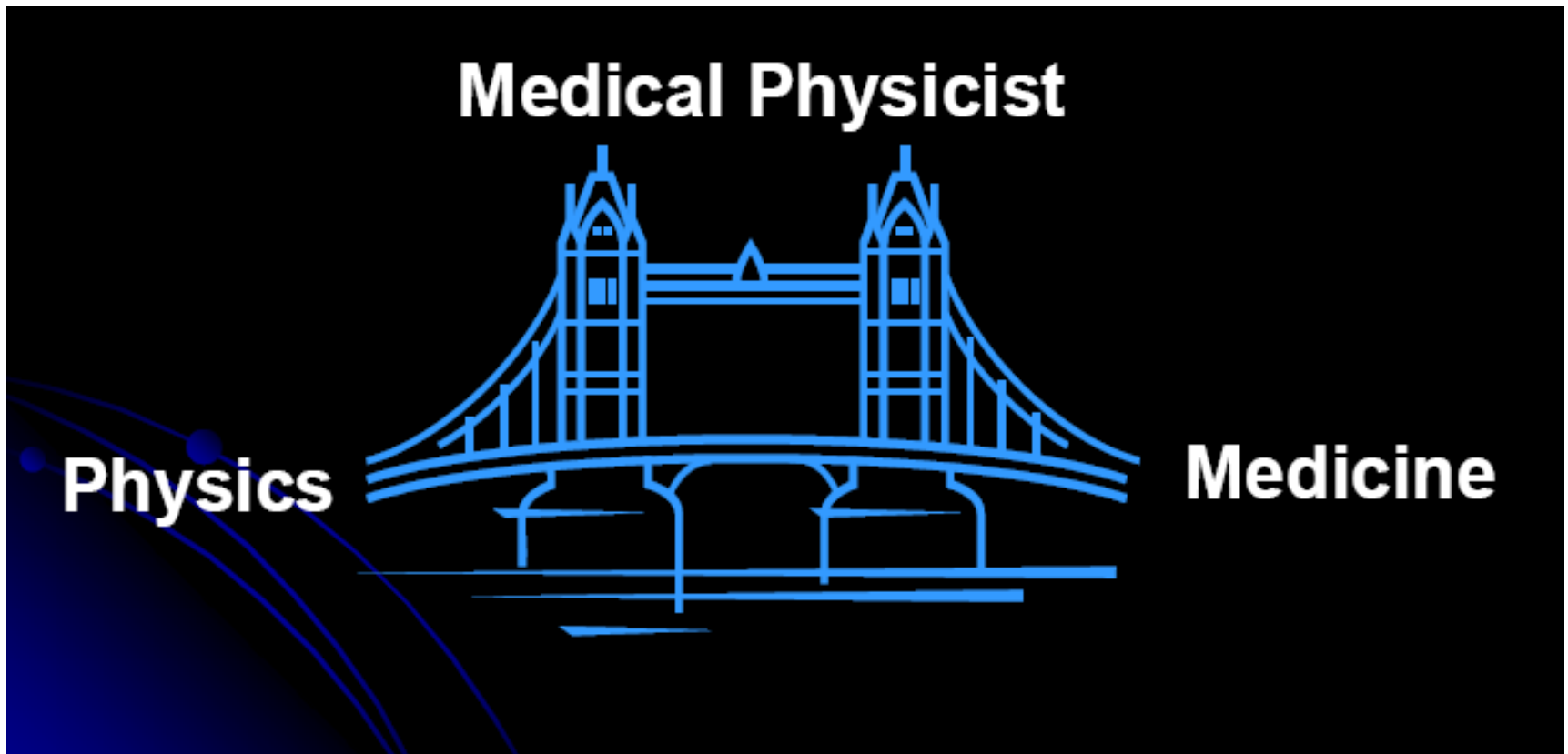
Student Support Services

While an undergraduate student:

- Research assistant
- Laboratory technologist assistant
- Co-op and internships
- Clubs, groups, course unions, societies
- Professional schools (medicine, dentistry, pharmacy, etc.)

- **First Year and Common Science Office**
- Free tutoring in first-year science courses
- Learning success center
- Access center
- Writing center
- Centre for student development and counseling
- Career center
- Ryerson student union
- Student financial assistance
- Health center

The Medical Physicist Bridges Physics and Medicine



Medical Physics Disciplines (Subfields)

- ② Therapeutic Radiological Physics or Radiation Physics
- ② Diagnostic Imaging Physics or Medical Imaging
- ② Medical Nuclear Physics
- ② Medical Health Physics

The Medical Physicist is Part of the Medical Team

Therapy

- ② Physician (Radiation, Oncologist, Surgeon, ...)
- ② Medical Physicist
- ② Medical Dosimetrist
- ② Physics Assistant
- ② Radiation Therapist

Imaging

- ② Physician (Radiologist, Cardiologist, ...)
- ② Medical Physicist
- ② Physics Assistant
- ② Radiological Technologist

Graduate Studies - MSc and PhD in Biomedical Physics

MSc Biomedical Physics – 2 years

PhD Biomedical Physics – 4 years

Campep accredited Option - in MSc and PhD programs for those seeking to enter a medical physics residency program in at least one subspecialty (radiation oncology, diagnostic radiology, or nuclear medicine) and assume appropriate responsibilities in the clinical practice of medical physics.

Admissions process

- The minimum grade requirement for admission consideration to a master's program is a 3.0/4.33 (B or equivalent) in the last two years of study
- For doctoral studies, you must have achieved a minimum of 3.33/4.33 (B+ or equivalent) in your master's program.

ACADEMIC PROGRAM	TOEFL (IBT)	IELTS	MELAB	CAEL	PTE
General Requirement	93	7.0	85	70	63

New International STUDENTS

ISS is the designated support office for all international students and provides services and programs to assist you throughout your time at Ryerson. It is crucial for you to contact ISS.

[BEFORE YOU ARRIVE IN CANADA](#)

[ARRIVAL & ORIENTATION](#)

[GET HELP FROM YOUR PEER SUPPORTER](#)

Get help from our ADVISORS

Our advisors have the knowledge and expertise to guide international students, staff/faculty concerning immigration, working, proof of enrollment, health insurance, social/academic challenges, and more.

[BOOK AN ADVISING APPOINTMENT](#)

[REQUEST A RYERSON STATUS LETTER](#)

[SIGN UP FOR AN IMMIGRATION WORKSHOP](#)

Life in CANADA

ISS offers a diverse assortment of services and cultural/social activities that strive to nurture student engagement and development, and create a sense of community while at Ryerson and in Canada.

[UNIVERSITY HEALTH INSURANCE PLAN](#)

[SIGN UP FOR AN EVENT](#)

[WORKING IN CANADA](#)

<http://www.ryerson.ca/internationalsupport/index.html>

Tuition Fees and Scholarships

Tuition Fees

~10K (local)

~20K (international)

Scholarships:

~12K - Supervisor

~10K - Teaching Assistant

~5-20K - Stipend

Cost of Life in Toronto: ~12K

Classes

Master:

5 courses including Exams
3 Advisory Meetings

PhD:

3 courses including Exams
3 Advisory Meetings
PhD Exam

Mixed Form: Cotutelle Program (Double Degree)

PhD:

Ryerson:

3 courses including Exams

3 Advisory Meetings

PhD Exam

KMA:

?