



# Physics Refresher Course UNENE Introduction August 29, 2020

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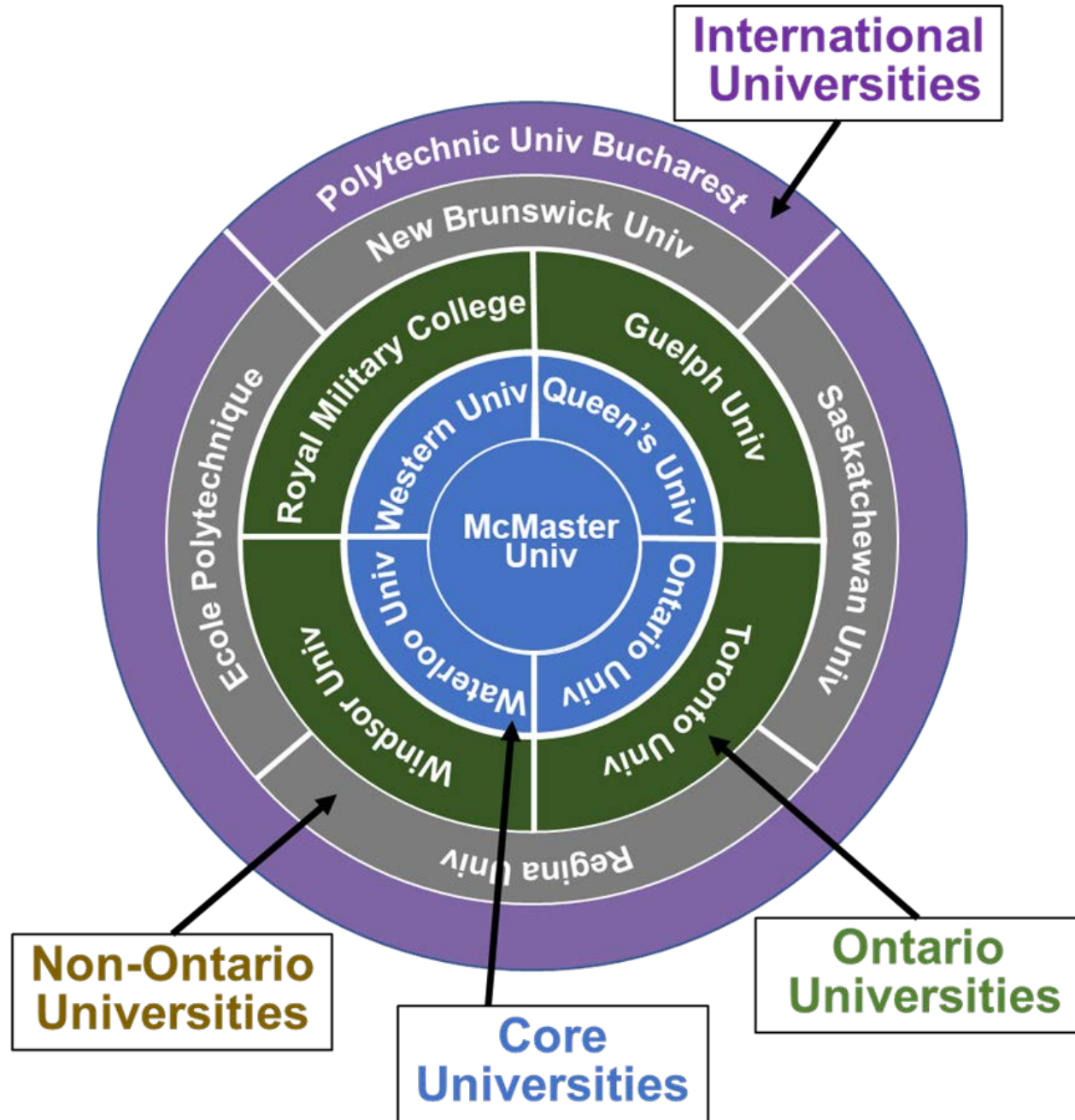
**UNENE**  
University Network of  
Excellence in Nuclear  
Engineering

# Outline

- UNENE Organization
- UNENE Education Programs
- UNENE Courses
- UNENE Course Schedule
- Selected UNENE Rules and Procedures



# UNENE Universities





# UNENE Industrial Partners

(by number of students since program start)

- Ontario Power Generation (OPG)
- SNC-Lavalin-Nuclear (formerly Candu Energy Inc)
- Bruce Power
- Canadian Nuclear Labs (CNL) (formerly AECL-CRL)
- Canadian Nuclear Safety Commission(CNSC)
- Kinectrics
- Nuclear Waste Management Organization (NWMO)
- CANDU Owners Group (COG)
- Natural Resources Canada (NRCan)



# UNENE Graduate Courses

UN 500	UNENE Project UOIT	Ontario Tech University
UN 501	Nuclear Fuel Management	
UN 502	Nuclear Plant Systems and Operations	
UN 503	Nuclear Energy in Society: Regulations and Energy Future	
UN 504	Small Modular Reactors	
UN 600	UNENE Project Western	Western University
UN 601	Control, Instrumentation and Electrical Systems in CANDU Power Plants	
UN 602	Nuclear Fuel Waste Management	
UN 603	Project Management for Nuclear Engineering	
UN700	UNENE Project Waterloo	Waterloo University
UN 701	Engineering Risk and Reliability	
UN 800	UNENE Project McMaster	McMaster University
UN 802	Nuclear Reactor Physics	
UN 803	Nuclear Reactor Safety Design	
UN 804	Nuclear Reactor Heat Transport System Design	
UN 805	Introduction to Operational Health Physics	
UN 806	Nuclear Fuel Engineering	
UN 807	Power Plant Thermodynamics	
UN 808	Reactor Chemistry and Corrosion	
UN 901	UNENE Project Queen's	Queen's University
UN 901	Nuclear Materials	



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# UNENE Programs

- **Master of Engineering program (course fee is \$2,250)**
  - Admission at any of the 5 universities – graduate admission criteria apply
  - 10 courses required
  - 4 core courses must be taken (from 4 available)
  - 6 elective courses (from 12 available)
  - 2 courses can be replaced with a Project Course
- **Diploma program (course fee is \$2,250)**
  - Admission at any of the 5 universities – graduate admission criteria apply
  - 4 courses required
  - 2 core courses must be taken (from 4 available)
  - 2 elective courses (from 12 available)
- **Training course (course fee is \$1,100)**
  - Industry employees can decide to take any UNENE graduate course as a training course at the same time as the graduate course is given
  - Registration by UNENE, no graduate level admission criteria apply
  - No graduate credit will be issued
  - Certificate of course completion for student who satisfy the course evaluation criteria: exam, assignments, etc. with graduate level mark)



# M.Eng. Course Schedule 2020-2021

## Refresher courses (2020-2021)

- [Mathematics](#) / Wei-Chau Xie / Waterloo / Repeat course  
**2020 August**
- [Reactor Physics](#) / Ben Rouben and Eleodor Nichita / McMaster  
**2020 August**

## Graduate Courses (2020-2021)

- [UN802](#) / Reactor Physics / Ben Rouben and Eleodor Nichita / McMaster  
**2020 September – November 2020**
- [UN502](#) / Plant Operations / Glenn Harvel / Ontario Tech  
**2021 January – March 2021**
- [UN805](#) / Health Physics / Josip Zic / McMaster  
**April – June 2021**
- [UN503](#) / Regulation and Energy / Imtiaz Malek / Ontario Tech  
**June – August 2021**



# UNENE Multi-Year Course Schedule

UNENE - Course Schedule										02-Apr-20	
<b>2020-2021</b>											
Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21
UN802 Reactor Physics Design				UN502 Reactor Operations			UN805 Radiation Protection		UN503 Regulation & Energy		
<b>2021-2022</b>											
Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22
UN804 Thermalhydraulics Design				UN803 Reactor Safety Design			UN504 Small Modular Reactor		UN601 Control & Instrument.		
<b>2022-2023</b>											
Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Jul-23	Aug-23
UN802 Reactor Physics Design				UN502 Reactor Operations			UN808 Chemistry		UN901 Nuclear Materials		

Course schedule in 2021-22 and 2022-23 subject to review based on student feedback





# Student Assessment

- **Assignments**
  - Professors may decide to give 1-4 assignments, depending on the project
  - The main assignment may require presentation
  - Assignments can be individual or group
- **Projects**
  - Some professor may give one project along with assignments, or without any assignments
  - Project verbal presentation required
  - Project can be individual or group
- **Exam**
  - Usually closed-book written exam



# Student Effort Required

- Depends on the student's background in former undergraduate education
- Depends on student's work experience
- Most students need about 100 hours of assignments and study time in addition to attendance of lectures
- If students have difficulties in understanding certain topics, they can request a few tutorials from the instructor



# Graduate Marks

- McMaster marks – typical marks at Ontario universities

A+            90 – 100%

A             85 – 89%

A-            80 – 84%

B+            77 – 79%

B             73 – 76%

B-            70 – 72%

- Marks below 70% fail the course and need it to be repeated
- Students need to avoid failing a course because of financial and timing consequences
- Majority of UNENE students never failed a course – a few failed because of family or work-related issues



# UNENE Course Logistics - 2

- **Classroom Course Delivery**
  - Courses normally given at the Durham College at Whitby
  - Each course given four weekends in 3-month period
  - Lecturing by the instructors over 3 weekends
  - Last weekend reserved for student presentations on assignments and course projects, and for the exam
  - Lecturing conducted in person, and also un parallel by Webex online session
  - Webex online session recorded, and provided to students on the UNENE website (password protected)



# UNENE Course Logistics - 3





# UNENE Course Logistics - 4

- **Working with Covid-19 Restrictions**
  - In line with the directives from McMaster University and the other core universities, starting with March 15, UNENE courses are being delivered by Webex
  - UNENE has already used for many years a parallel-teaching model: in class and by Webex - has significant experience in delivering lectures using distance-education model
  - In the next few months, or longer if required, UNENE will continue with the graduate education and training courses using distance-education models



# UNENE Course Logistics - 5

- **Course registration**
  - Important to indicate to UNENE as early as possible intention
  - Need to formally register minimum one month before the course starts
- **Course withdrawal**
  - Caution: UNENE rules are different compared to university rules
  - UNENE courses are compressed, every weekend lectures are worth of 1/3 of the course
  - UNENE withdrawal rules – withdrawal accepted in the week following first weekend delivery



# UNENE Course Logistics - 6

- Registration for single graduate course
  - Some of the core universities (e.g., McMaster University) can register students for a single graduate course
  - Another option is to register for the Diploma program, and taking one or up to 4 courses, students either graduate with four courses, or may decide to withdraw after taking one or more courses
  - Graduate registration rules apply
- Students can register for single training course
  - UNENE can register students for any UNENE graduate course as a **training course**
  - Students do not need to satisfy graduate registration criteria, but will not receive graduate credit, only training certificate





# UNENE Course Logistics - 7

- **Delivery of lectures**
  - Normally lectures given on weekends (Saturday and Sunday)
  - Tutorials can be given during workdays in the evenings if requested by the students
  - Lectures begin at 9 am, and end by 4:30 pm
  - UNENE suggests that students outside of Metro Toronto area book a hotel in Whitby for the weekends when lectures are given



# UNENE Course Logistics - 8

- Attendance of lectures
  - Classroom mode (in person)
    - Guidance being prepared
    - Only one weekend lectures can be missed
    - If a student need to miss another lecture weekend (2<sup>nd</sup> time) special request needs to made to the Instructor and the Program Director
  - Online mode (by Webex)
    - Online attendance required
    - Missing lectures needs to be requested from the instructor
  - Reading course
    - No lectures, student perform self study
    - Offered only under certain circumstances when not enough students are registered



# UNENE Course Logistics - 8

## UNENE contacts:

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# Questions ?