

Course Information (NST2040)

| Course Information | |
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| Course Code: | NST2040 |
| Course Title: | Quantitative Reasoning Foundation (QRF): Quantifying Nuclear Risks |
| NUSC Category: | Before 2022 cohort: QRF Foundation course 2022 cohort onwards: Making Connections (MC): Sciences and Technologies (ST) |
| Pre-requisite: | 2022 cohort onwards: Students are required to clear RWD before they can take NST2040. |
| Instructor(s): | Dr Philippe Raynal NUS College |

| Course Details | |
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| Introduction | What is the lowest dose of radiation that can lead to cancer? Is it safe to live near a nuclear power plant? Can your home make you sick because of the presence of a natural radioactive gas called Radon? The module examines nuclear risks from a quantitative standpoint. After introducing the basics of nuclear power, we will learn the facts about nuclear risks and how they can be measured. The goal of the module is to provide students with the quantitative methods and the tools they need to be critically thinking citizens. |
| Syllabus | <p>The module focuses on quantifying aspects of nuclear risks. In the process, we will learn how to pose a scientific question, how to collect relevant data, and how to analyse the data to draw sound conclusions. The whole module can be seen as a journey through the scientific method, a rational and objective method of investigation based on facts.</p> <p>The module will consist of weekly lectures. Students will also write individual essays and make an oral presentation in groups of four or five. Assessments will also include short quizzes.</p> <p>Syllabus</p> <ul style="list-style-type: none"> • Introduction - scientific approach and quantitative reasoning • Nuclear energy • Rate and probability of nuclear accidents • Radiation exposure • Radiation and health <p>Basic Reading List</p> <ul style="list-style-type: none"> • Introductory Statistics - Neil Weiss - Pearson Addison-Wesley (1982-2012) • Energy Systems and Sustainability, power for a sustainable future - Edited by B. Everett, G. Boyle, S. Peake, and J. Ramage, Oxford University Press (2003-2011) • Nuclear Safety - Gianni Petrangeli - Elsevier Butterworth-Heinemann (2006) |
| Assessment | <p>Class participation 5%</p> <p>Quizzes 10%</p> <p><u>Assignments</u></p> <p>Homework 5%</p> <p>Essays 40% (essay outline 10% and final essay 30%)</p> |

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| | <u>Scientific project</u> Written summary 10% Oral presentation 30% (collective 20% and individual 10%) |
| Note / URL | |