



IAN MACCARTHY

INTEGRATED SCIENCE
AMBASSADOR

3RD YEAR, MAJOR

THEME OF MY INTEGRATION: Materials Science and Mathematics

My degree is about the stuff we see around us, and asking why it is the way it is. This question takes me across disciplines to examine materials at every scale from the molecular to the planetary, everywhere seeking to understand the factors that explain why materials look, feel, and behave as they do. All this relies heavily on advanced quantitative skills, tying together the two parts of my theme.

WHAT I AM INTEGRATING:

DISCIPLINE #1

Chemical Materials:

On a small scale, many material properties can be understood by their molecular composition and other chemical considerations, for example, the relative strength of intermolecular forces governing phase change boundaries

DISCIPLINE #2

Earth Materials:

On a grander scale, whole landscapes are essentially aggregate materials whose behaviour can be understood with geophysical and geological principles, for example, the formation of marine clay deposits and subsequent ground water action affecting slope stability.

DISCIPLINE #3

Mathematics:

My curiosity about the nature of materials is matched by a fascination with the power and elegance of mathematics, which can help everywhere from modeling force fields in continuous media to making sound inferences from data.

SAMPLE CURRICULUM RATIONALE

EOSC 453 - Physics of the Earth and Other Planets

This is a capstone course for my earth materials component, which undertakes the identification and quantitative analysis of a wide variety of geophysical phenomena like mantle dynamics or tectonic geomorphology, dealing with the science of materials on a massive scale.

PHYS 315 - Quantum Physics of Material

This is a capstone course for my chemical materials component, which dives even deeper into the underlying quantum physics of a range of chemical properties like crystal structure and elasticity, dealing with the science of materials on the smallest scale.

CONTACT

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