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Spring 2-1-2022

M 595.01: Special Topics in Topology - Indra's Pearls

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Recommended Citation

Syllabus: M595 Indra's Pearls - Spring 2022

Instructor:

Instructor: Eric Chesebro

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Office hours: Contact me to set up an in-person appointment or ZOOM.

Course Overview

This course will follow the beautiful book *Indra's Pearls* by David Mumford, Caroline Series, and David Wright. Their book is an illustrated discription of their computer aided study of how certain groups of Mobius transformations transform the complex plane. They coach and encourage readers to write their own code to draw similar amazing fractal pictures; we will follow their lead.

We will also try to dig a little deeper and learn about several areas of math that inspired this book. Along the way, we will investigate 2 and 3-dimensional hyperbolic space, geometric surfaces and manifolds, and refine our skills for working with infinite non-abelian groups.

There is a *YouTube* video you should look for to hear Caroline Series discuss the book. You should be able to find it from the title of her talk, *Indra's Pearls: A Mathematical Adventure*.

Prerequisites

If you have taken multivariable calculus, undergraduate abstract algebra and are comfortable reading and writing proofs, you should be prepared for this course. We will be writing some computer programs, but it won't require advanced computer skills.

It is my intension to adjust the content of the course to meet the needs of the enrolled students

Text

Indra's Pearls, The vision of Felix Klein , by Mumford, Series, and Wright.

Homework and expectations

We will discuss our options here on the first day of class.

Guidelines and policies

University dates and deadlines

You should be aware of the important dates and deadlines posted by the Registrar's Office.

Academic honesty

I take academic honesty very seriously and I will act on any transgressions that I notice. Misconduct is subject to an academic penalty in this course and/or a disciplinary sanction by the university. We all know that a record of academic misconduct is a very bad thing to have documented in your academic history. All students should be familiar with the Student Conduct Code.

Disability modifications

The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and Disability Services for Students. If you think you may have a disability adversely affecting your academic performance, and you have not already registered with Disability Services, please contact Disability Services in Lommasson Center 154 or call 406.243.2243. I will work with you and Disability Services to provide an appropriate modification.