This 4-credit course is open to 2nd year graduate students and higher or with permission from instructor.

This course provides introduction to string theory and its current status. I will make this course self-contained, in that I will explain all of the background material that is needed to understand string theory in a step-by-step manner.

Questions such as:

- Why do string theorists need to consider higher dimensions?
- How does General Relativity arise as a prediction of string theory?
- How could string theory possibly be used for nuclear physics and even condensed matter physics?

will all be addressed in an accessible approach.

**Instructor** : Prof. Justin Vazquez-Poritz
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**Class Time** : Graduate Center Campus – Wednesdays at 9:30 am – 12:35 pm

**Topics To Be Covered:**

- Historical origins: Is string theory needed?
- The relativistic string, classical string dynamics
- Three routes to string quantization
- Conformal field theory
- String interactions
- Worldsheet and spacetime supersymmetry
- Open strings and D-branes
- String dualities and M-theory
- String geometry: orbifolds and Calabi-Yau spaces
- Compactification
- Black holes in string theory
- Gauge theory/string theory duality
- The AdS/CFT correspondence, nuclear physics and condensed matter systems
- Braneworld scenarios

**Textbook** : Instructor’s self-contained lecture notes will be provided to students.

**Grades** : Grades are based on weekly homework assignments.