

# **graduate COMMITTEE curriculum PROPOSAL FORM**

## A. Cover page (rover over text for more instructions- please delete red instructions)

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| --- | --- | --- |
| A.1[. Course or program](#_acknowledge) | **MATH 522 COmbinatorics** |  |
| Academic Unit | Faculty of Arts and Sciences  |  |
| A.2. [Proposal type](#type) | Course: creation |  |
| A.3. [Originator](#Originator) | Leonardo Pinheiro | [Home department](#home_dept) | Department of Mathematical Sciences |
| A.4. [Rationale](#Rationale) | This course provides students with an overview of advanced combinatorics including current research. The class has been offered over the years as a topics course and it has been used as a core course substitution.  |
| A.5. [Student impact](#student_impact) | The creation of this course will simplify course selection and advising. |
| A.6. [Impact on other programs](#impact) | None |
| A.7. [Resource impact](#Resource) | [Faculty PT & FT](#faculty" \o "Need to hire new full-time or part-time faculty? This is where you indicate if this proposal will be affecting FLH in your department/program.):  | None |
|  | [Library:](#library) | None  |
|  | [Technology](#technology) | None |
|  | [Facilities](#facilities): | None |
| A.8. [Semester effective](#Semester_effective) | Fall 2022 | A.9. [Rationale if sooner than next Fall](#Semester_effective) |  |
| A.10 [Changes to the website](#Signature_2) | None |

## B. NEW OR REVISED COURSES

|  | Old ([for revisions only](#Revisions)) | New |
| --- | --- | --- |
| B.1. [Course prefix and number](#cours_title)  |  | MATH 522 |
| B.2. Cross listing number if any |  |  |
| B.3. [Course title](#title)  |  | Combinatorics |
| B.4. [Course description](#description)  |  | The existence, construction, and properties of systems of finite sets whose arrangements satisfy various balance properties are explored. Topics may include combinatorial designs, cyclic construction methods and current research. |
| B.5. [Prerequisite(s)](#prereqs) |  | Graduate status or consent of department chair |
| B.6. [Offered](#Offered) |  | As needed. |
| B.7. [Contact hours](#contacthours)  |  | 3  |
| B.8. [Credit hours](#credits) |  | 3 |
| B.9. [Justify differences if any](#differences) |  |
| B.10. [Grading system](#grading)  |  | Letter grade |
| B.11. [Instructional methods](#instr_methods) |  | Lecture  |
| B.11.a [Delivery Method](#instr_methods) |  | On campus  |
| B.12.[Categories](#required) |  | Free elective  |
| B.13. [How will student performance be evaluated?](#performance) |  | Attendance | Class participation | Exams |Presentations | Papers | Class Work | | Projects |  |
| B.14. [Redundancy with, existing courses](#competing) |  | N/A |
| B. 15. Other changes, if any |  |

| B.16. [Course learning outcomes](#outcomes): List each outcome in a separate row | [Professional organization standard(s)](#standards), if relevant  | [How will each outcome be measured?](#measured) |
| --- | --- | --- |
| Students will explore the relationships between a variety of combinatorial designs. |  | See B.13 |
| Students will utilize finite fields in the construction of cyclic combinatorial designs. |  | See B.13 |
| Students will use the method of symmetric differences to verify that cyclic constructions designs satisfy necessary balance properties. |  | See B.13 |
| Students will write combinatorial proofs.  |  | See B.13 |

| B.17. [Topical outline](#outline): Please do not include a full syllabus |
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| 1. Block Designs
2. Latin Squares
3. Finite Fields
4. Difference Sets and Systems
5. Symmetric Designs
6. Finite Projective Planes
7. Orthogonal Latin Squares
8. Steiner Triple Systems
9. League Schedules
10. Whist Tournaments
 |

## D. Signatures

##### D.1. Approvals:

##### Required from department chairs, program directors, and deans from the academic unit originating the proposal.

| Name | Position/affiliation | [Signature](#_Signature" \o "Insert electronic signature, if available, in this column) | Date |
| --- | --- | --- | --- |
| Dr. Lisa Humphreys  | Program Director - Mathematical Studies M.A. | Lisa Humphreys | 03/18/2022 |
| Dr. Rebecca Sparks | Chair of Mathematical Sciences | Rebecca Sparks | 03/18/2022 |
| Dr. Earl Simson | Dean of Arts and Sciences | Earl Simson | 04/01/2022 |