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# Category theory with applications (MAT6932)

## Welcome to Category Theory!

All further information will be published on Canvas.

**Disclaimer:** This syllabus is a subject to change and it is your responsibility to keep updated. Nevertheless, any modifications will appear in announcements on Canvas.

**Instructor:** Dana Bartošová **Office:** LIT 436 **Email:** [dbartosova@ufl.edu](mailto:dbartosova@ufl.edu)

**Class meetings:** MWF 11:45am-12:35pm in LIT 219.

**Office hours:** M 3-3:50pm, T 1:55-2:45pm (via Zoom), F 10:40-11:30am, or by appointment.

**Announcements on Canvas:** There will be announcements with information on presentations, changes, and reminders of homework due dates.

**Texts:** There is no specific textbook required for this course. Here are a few free online resources that I will be using.

1. Emily Riehl, [Category theory in context](#).
2. Jiří Adámek, Horst Herrlich, and George E. Stecker, [Abstract and Concrete Categories - The Joy of Cats](#)
3. Tom Leinster, [Basic Category Theory](#).
4. Michael Barr and Charles Wells, [Category Theory for Computing Science](#).

## Course description

This is an introductory course on Category theory with many examples and modern applications. We will put a number of algebraic and topological objects into the categorical perspective, discuss when two (seemingly unrelated) categories are quite the same (such as the Stone duality between Boolean algebras and compact 0-dimensional topological spaces) or alike, explore further types of relationship between categories (Yoneda Lemma, adjoint functors). We will look into how specific

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constructions of products and direct limits, or universal objects can be seen in a unified and generalized way. If time permits, we will visit topos theory. The notions and results will be accompanied and motivated by recent applications to combinatorics, model theory, and ergodic theory.

## Course requirements and evaluation

**Assignments:** Every two weeks I will post 4 problems to think about out of which 1 shall be submitted via Canvas.

**Presentation:** You can choose any topic related to the course to research deeper about and present your findings to everyone during our usual class meeting. You can work alone or in pairs. The idea is for everyone to speak 20-30min, but if you would like to take full 50 minutes, that works too.

**Grades:** Each homework (total of 6) will be 10 points and the presentation will be 40 points; in total 100 points. The grades will be distributed as follows: A above 90%, A- 85-89%, B+ 80-84%, B- 75-79%, C+ 70-74%, C 65-69%, C- 60-64%, D+ 55-59%, D 52-54%, D- 50-51 %, E, I, NG, WF 49% and below. For university grading policies see <https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies>.

## Diversity, equity, and inclusion statement

I am committed to diversity and inclusion of all students in this course. I acknowledge, respect, and value the diverse nature, background and perspective of students and believe that it furthers academic achievements

It is my intent to present materials and activities that are respectful of diversity: race, color, creed, gender, gender identity, sexual orientation, age, religious status, national origin, ethnicity, disability, socioeconomic status, and any other distinguishing qualities.

## Honor code

UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Honor Code specifies a number of behaviors that are in violation of this code and the possible sanctions. [Click here to read the Honor Code](#). Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor in this class.

## Class attendance

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies. [Click here to read the university attendance policies.](#)

## Accommodations for students with disabilities

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center. [Click here to get started with the Disability Resource Center.](#) It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

## Online evaluations

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. [Click here for guidance on how to give feedback in a professional and respectful manner.](#) Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via [ufl.bluera.com/ufl/](http://ufl.bluera.com/ufl/). [Summaries of course evaluation results are available to students here.](#)

## Health and wellness

*U Matter, We Care:* If you or someone you know is in distress, please contact [umatter@ufl.edu](mailto:umatter@ufl.edu), 352-392-1575, or visit [U Matter, We Care website](#) to refer or report a concern and a team member will reach out to the student in distress.

*Counseling and Wellness Center:* [Visit the Counseling and Wellness Center website](#) or call 352-392-1575 for information on crisis services as well as non-crisis services.

*Student Health Care Center:* Call 352-392-1161 for 24/7 information to help you find the care you need, or [visit the Student Health Care Center website.](#)

*University Police Department:* [Visit UF Police Department website](#) or call 352-392-1111 (or 9-1-1 for emergencies).

*UF Health Shands Emergency Room / Trauma Center:* For immediate medical care call 352-733-0111 or go to the emergency room at 1515 SW Archer Road,

Gainesville, FL 32608; [Visit the UF Health Emergency Room and Trauma Center website](#)

## Academic resources

*E-learning technical support:* Contact the [UF Computing Help Desk](#) at 352-392-4357 or via e-mail at [helpdesk@ufl.edu](mailto:helpdesk@ufl.edu).

[Career Connections Center](#): Reitz Union Suite 1300, 352-392-1601. Career assistance and counseling services.

[Library Support](#): Various ways to receive assistance with respect to using the libraries or finding resources.

[Teaching Center](#): Broward Hall, 352-392-2010 or to make an appointment 352- 392-6420. General study skills and tutoring.

[Writing Studio](#): 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers.

[Student Complaints On-Campus](#): [Visit the Student Honor Code and Student Conduct Code webpage for more information.](#)

[On-Line Students Complaints](#): [View the Distance Learning Student Complaint Process.](#)

