# Welcome to RenR 480/711

*Section II*

Introduction: September 5, 2017

Instructor: David Montwé

# About the course

- Section II
  - Same theory, concepts and basic knowledge as Section I
  - Share some material
  - Different assignments & exams

# About the course

**What you will learn about**

- Experimental design
- Data management
- Exploratory graphics
- Descriptive statistics
- Inferential statistics
- Visualization of data
- Communication in science
- R and R-Studio

# About the course

**What you will learn about**

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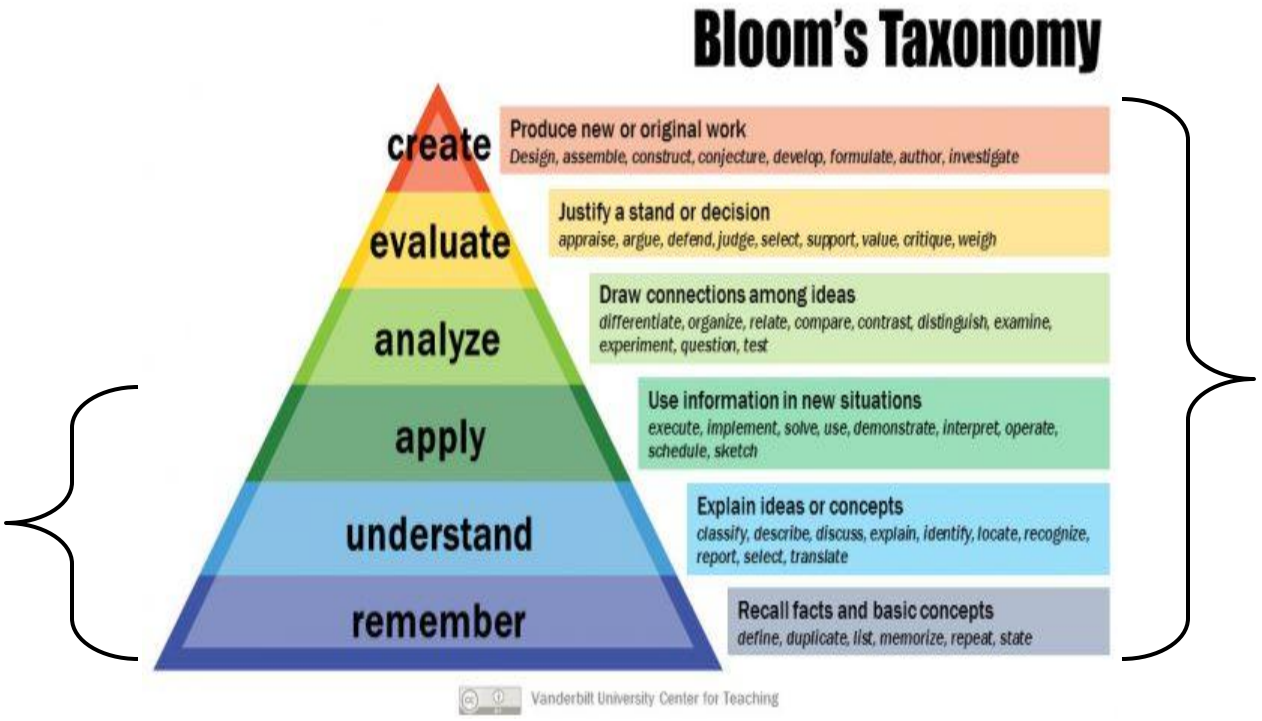
**How that will help you**

- In life:
  - Understanding how new knowledge is made
  - Critical thinking
- In a career:
  - Data management
  - Visualization and communication
- In science:
  - Methods for designing and implementing sound research

# About the course

**RenR 480** **RenR 711**




From Vanderbilt University (Creative Commons): https://cft.vanderbilt.edu/guides-sub-pages/blooms-taxonomy/

# About the course

**RenR 480**

| | | |
|---|---|---|
| Participation | 20% | |
| Assignments | 30% | TBA |
| Course notes | 20% | Dec 7 |
| Exam | 30% | Dec 7 |

**RenR 711**

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| Draft project | 20% | Oct 26 |
| Final project | 30% | Dec 5 |
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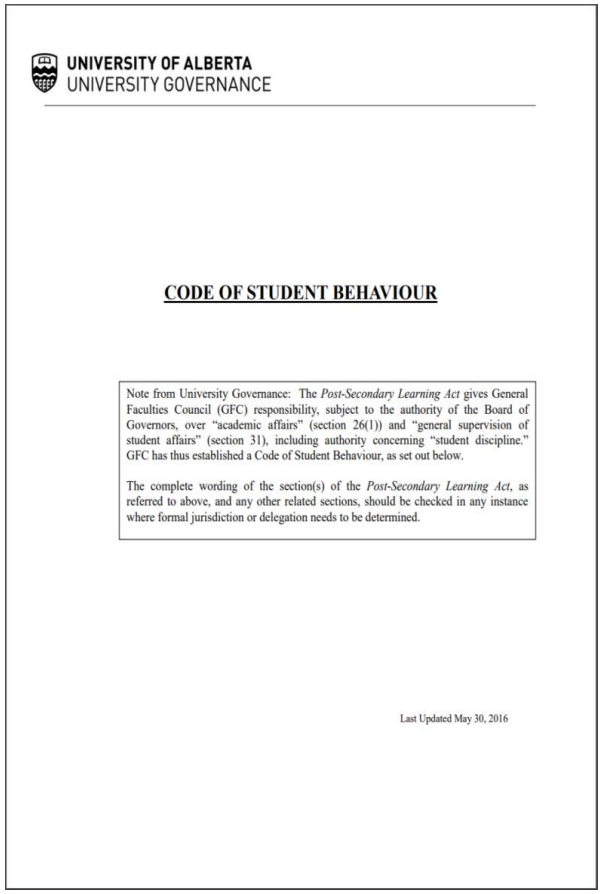
- Start thinking about this right away
- Can be your thesis project
- Need an idea? Come talk to me soon

# Academic integrity



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Note from University Governance: The *Post-Secondary Learning Act* gives General Faculties Council (GFC) responsibility, subject to the authority of the Board of Governors, over "academic affairs" (section 26(1)) and "general supervision of student affairs" (section 31), including authority concerning "student discipline." GFC has thus established a Code of Student Behaviour, as set out below.

The complete wording of the section(s) of the *Post-Secondary Learning Act*, as referred to above, and any other related sections, should be checked in any instance where formal jurisdiction or delegation needs to be determined.

Last Updated May 30, 2016

http://www.deanofstudents.ualberta.ca/AcademicIntegrity.aspx

# Academic integrity

Be honest and do good research

Credit other people's work through citation

- Course expectations:
  - Re-phrase ideas in your own words and cite the author of the idea:

    It is well-known that statistics are useful (Smith *et al.* 2017)
  - If you absolutely must repeat 7 or more words that you read elsewhere, you need quotation marks ("") and a citation:

    Smith *et al.* (2017) state: "RenR 480 is going to be a great course".
  - Working together on assignments and projects is ok, but the output should be your own (your own words)

# Scientific Misconduct

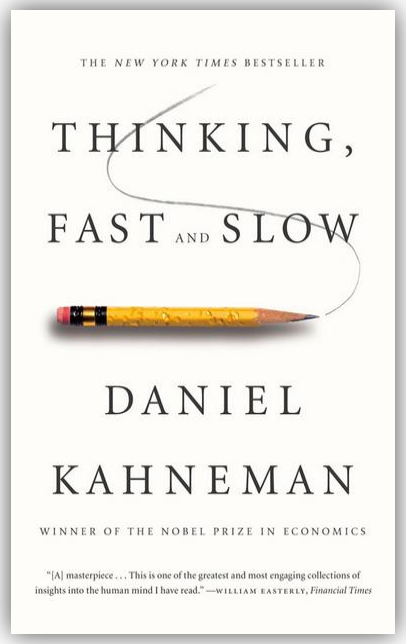
In research:

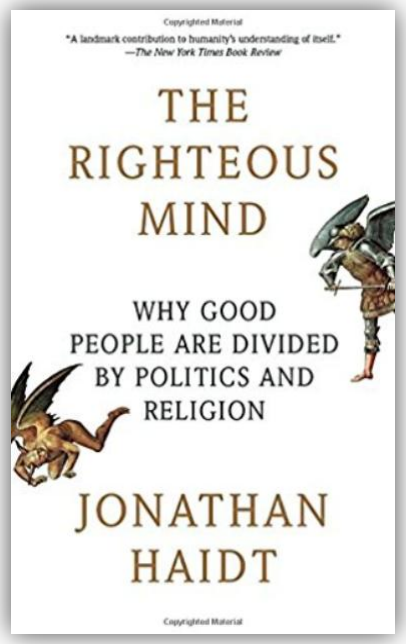
- Plagiarism: taking ideas and presenting them as your own
- Fabrication: making up new observations/data
- Falsification: Changing/omitting data to get the result you want

In coursework:

- Plagiarism on assignments or projects: taking text from other classmates or elsewhere
- Cheating on exams
- Falsification or fabrication

# For fun: reasoning mind & objectivity




- The “reasoning mind” finds justifications for the “intuitive mind”
- Wanting to “prove” your hunch can lead you astray
- As a scientist, you have to strive to be as objective as possible
- To help objectivity, it helps to have good research questions

# What makes a good research question?

1. Contributes new knowledge (answer not known)

**Not good**

Does clear-cutting reduce the number of trees in an area?

1. Already known

# What makes a good research question?

1. Contributes new knowledge (answer not known)
2. The result is interesting either way (you can still publish with a negative result)

**Not good** → **Good**

| | |
|---|---|
| Does clear-cutting reduce the number of trees in an area? | Can we use a technological methodology? |
| 1. Already known | 1. Not known<br>2. We'd want to know either way if we can/can't use the method |

# What makes a good research question?

1. Contributes new knowledge (answer not known)
2. The result is interesting either way (you can still publish with a negative result)
3. Larger implications and/or real-world impact = best

| **Not good** | **Good** | **Best** |
| --- | --- | --- |
| Does clear-cutting reduce the number of trees in an area? | Can we use a technological methodology? | Do forests benefit under climate change? |
| 1. Already known | 1. Not known<br>2. We'd want to know either way if we can/can't use the method | 1. Not known<br>2. We'd want to know either way if we should/shouldn't do something<br>3. Has real-world impact |

# In conclusion

- My commitment to you:
  - A positive and safe learning environment
    There are no “stupid questions”
  - Constructive feedback
    Training for constructive feedback (for course projects)
  - Fair assessments