STATUS OF ETHICS EDUCATION IN MCCORMICK:
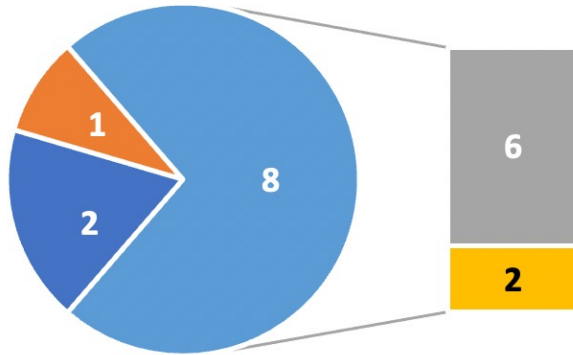# AN ANALYSIS OF SURVEY RESULTS

Survey Results

Survey sent to McCormick department and professional masters program leaders

- Responses from 6 BS departments, 5 graduate programs, and 4 professional MS programs

Inclusion of ethics in the BS degree

Is ethics included in curriculum/courses? (# Departments)

- No required course
- Integrated throughout curriculum
- Required course - Capstone
- Required course - Seminar

In McCormick, 8 of 11 programs include ethics in the core curriculum, most often in capstone design.

*Data from 5 additional programs retrieved from their handbooks
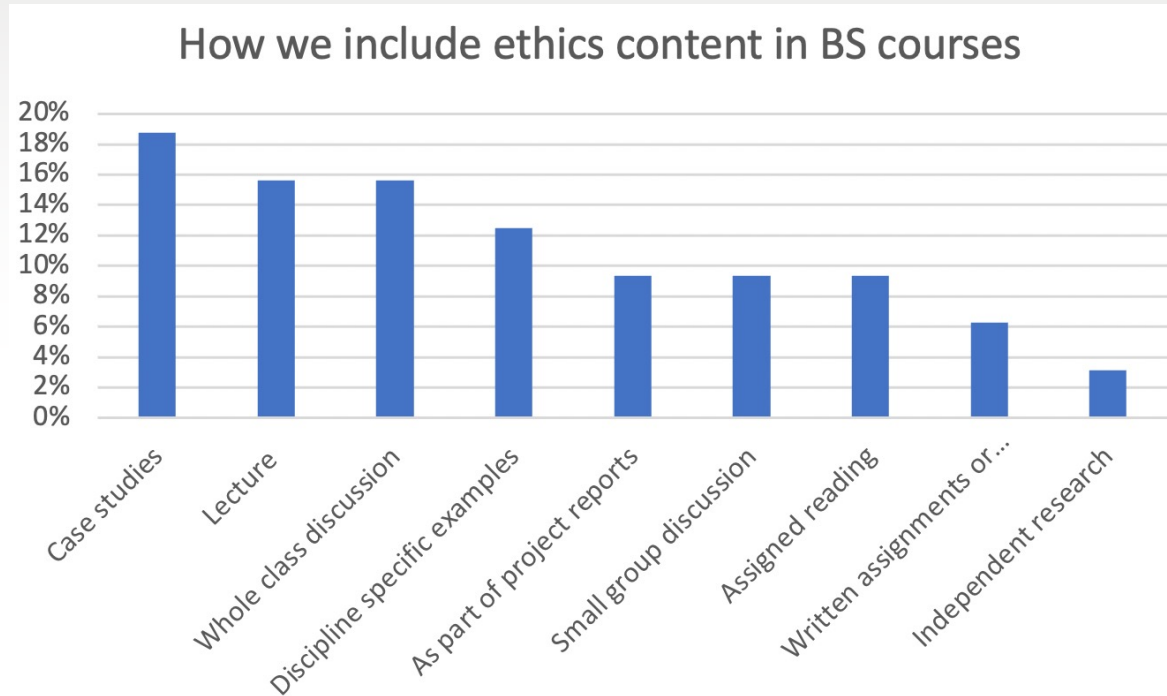
This data does not include DTC, which does contain ethics content

Approaches to topics vary

Codes of ethics and Ethical impacts of technology lead, but not by much.

Topics included in ethics training

Pie chart: 18%, 4%, 14%, 14%, 14%, 9%, 18%, 9%

- Codes of Ethics (IEEE, NSPE, ASCE, other professional society)
- Ethical Theories (Utilitarianism, Kantian Ethics, Virtue Ethics, Feminist Approaches to Ethics, etc.)
- Ethical Principles (e..g. justice, beneficence, respect)
- Responsible Conduct of Research
- Conflicts of Interest
- Legend Entry 5
- Ethical issues related to privacy
- Ethical impacts of technology
- Other

How ethics is introduced to students

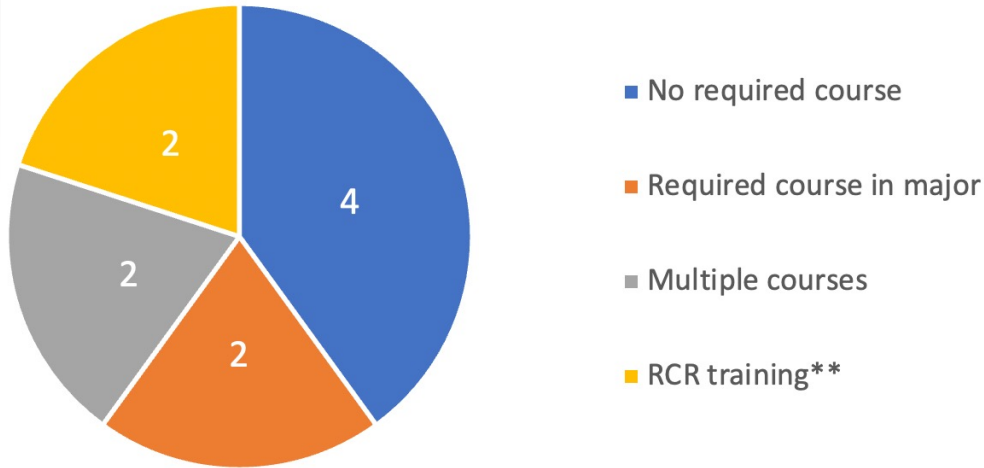## How we include ethics content in BS courses

A variety of activities to introduce concepts of ethics, including:

- Discipline-specific examples
- Impacts of how we use models
- Impacts of decisions on people or society
- Bias in user-observation
- Codes of Ethics
- Research misconduct
- CITI research training

Inclusion of ethics in graduate degree programs

Is ethcis included in the curriculum? (# departments/programs)**

- ■ No required course
- ■ Required course in major
- ■ Multiple courses
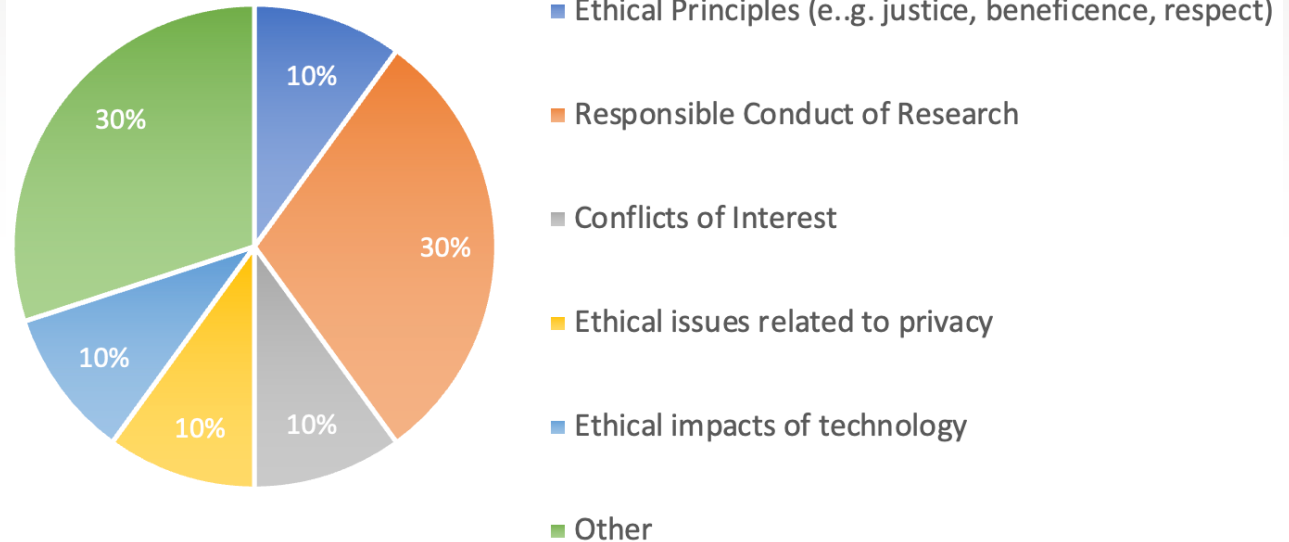- ■ RCR training**

Pie chart values: 4, 2, 2, 2

**Fewer graduate MS, PhD, and professional MS programs responded to the survey.
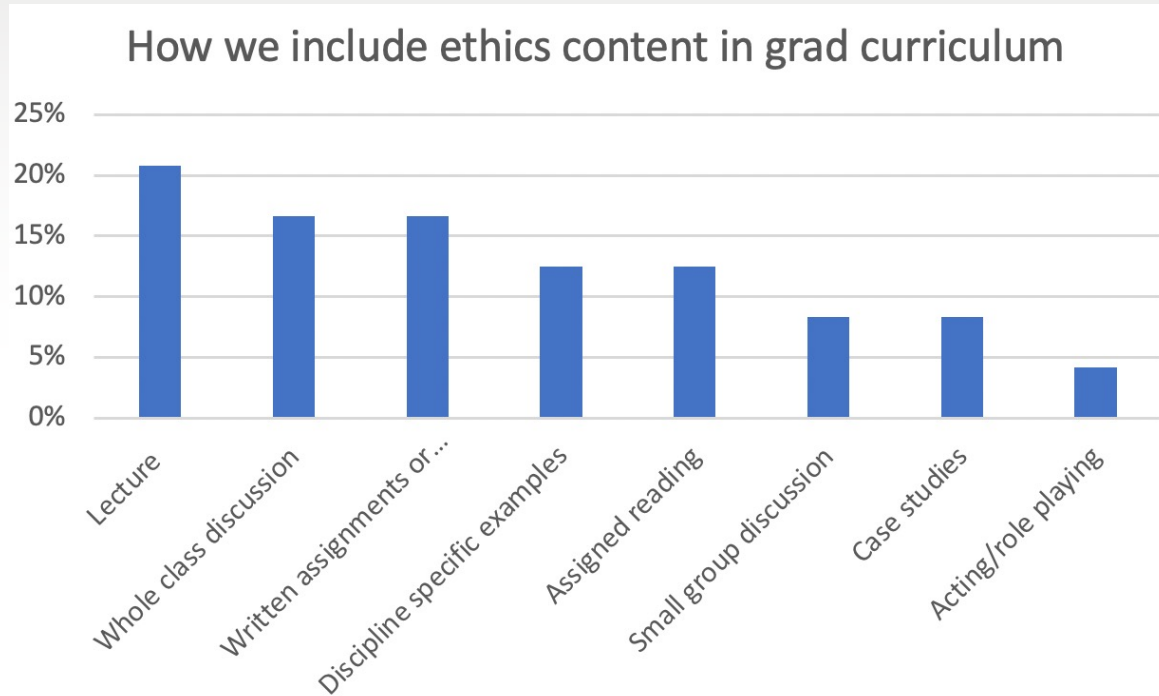
Approaches to topics vary in grad programs

- RCR training dominates.

- Notably, none of the respondents mentioned Codes of Ethics or Ethical Theories.

- "Other" included leadership topics and modeling topics.
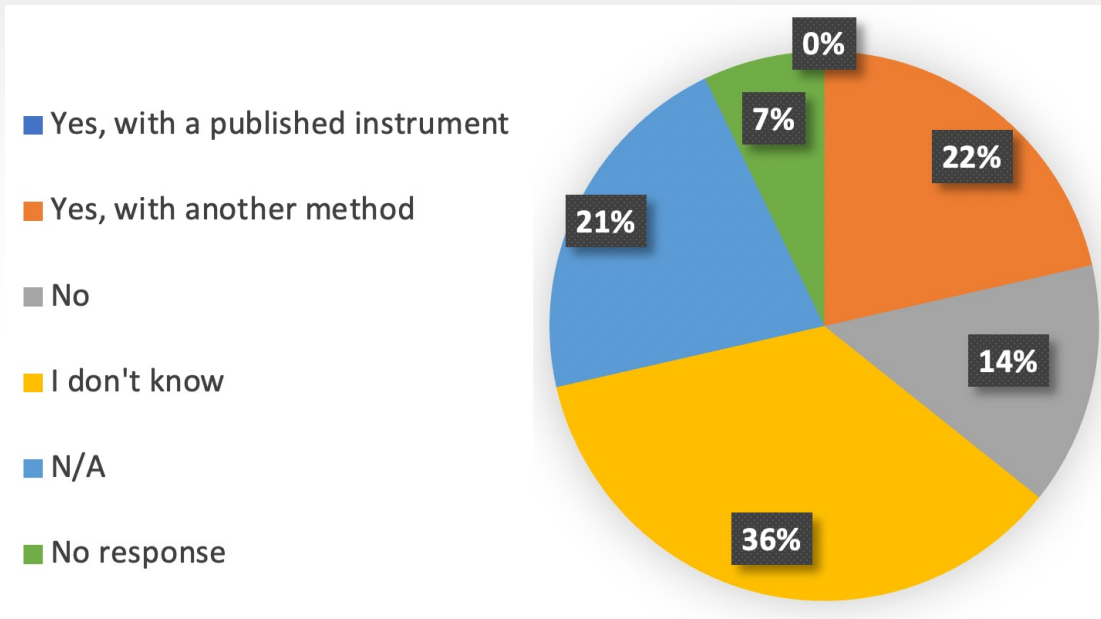
Topics included in ethics training

- Ethical Principles (e..g. justice, beneficence, respect)
- Responsible Conduct of Research
- Conflicts of Interest
- Ethical issues related to privacy
- Ethical impacts of technology
- Other

How ethics is introduced to students

How we include ethics content in grad curriculum

Fewer case studies, more lecture and discussion, including:
- Discipline-specific examples
- Deception in negotiation
- Impacts of how we use models
- Equity and fairness
- Research misconduct

We aren't really assessing student learning in ethics

Legend:
- Yes, with a published instrument
- Yes, with another method
- No
- I don't know
- N/A
- No response

Pie chart values:
- 0%
- 22%
- 14%
- 36%
- 21%
- 7%

Data for all programs (BS and grad).

Other methods used include
- Grading written assignments or presentations
- Interviews
- Evaluating a required section of the design report

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Some specific departmental examples

IEMS incorporates ethics throughout core curriculum and electives

- BS focus on impacts of choices made
  - Impact of design decisions on real people
  - Choice of objective in models (economically driven vs socially driven)
- PhD focus on predictive and prescriptive models
  - For example, in a prescriptive model that guides designs of systems for social good, equity and fairness are important considerations, and they are discussed in the context of building such models

Some specific departmental examples

- BME and ChBE undergrad programs use discipline-specific examples and require ethics to be addressed in capstone design projects
  - In ChBE students watch "Incident at Morales" where an engineer evaluates a design decision that is intended to save the company money but results in a chemical accident and loss of life
- Several PhD programs utilize Responsible Conduct of Research training

Some specific departmental examples

DTC has quite a few instances of ethics training

- Professional Codes of Conduct (IEEE, ASME, etc.) are introduced in the textbook

- Guest lecturers have discussed research ethics in the context of design

- Students must reflect on how bias might impact their user-observations

- Individual instructors may include ethical considerations and even assess student learning, but it is not a widespread practice