

Course and Professor Evaluations (CAPEs) Analysis



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Goals

- Engineering classes are hard!
- ECE, CSE, MAE, Bioengineering departments
- Determine quality of engineering courses

Datasets and Methodology

- Data is from cape.ucsd.edu
 - 48.67% of students fill out CAPEs
- Methods for processing data:
 - Used Pandas to clean and preprocess the data
 - Separated into 4 departments

Best Course in Each Department

- Rankings based on student feedback
- Classes with most **number of feedbacks** and ***highest* recommended instructor, course, and grades received**

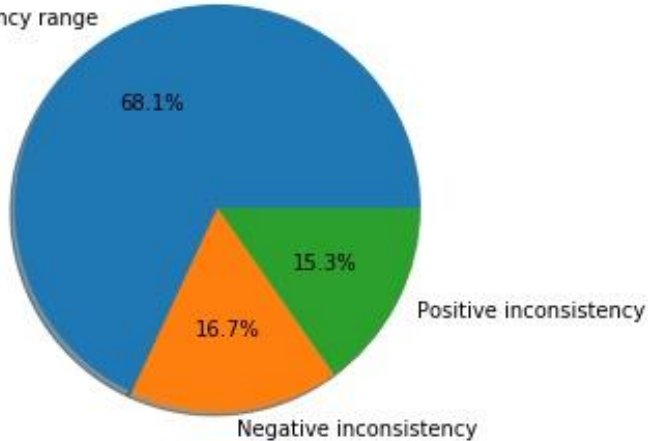
| Department | Best Course |
|------------|-------------|
| ECE | ECE 5 |
| CSE | CSE 191 |
| BENG | BENG 169B |
| MAE | MAE 165 |

Course Consistency for ECE and CSE

- Consistency : How close is expected grade to the actual grade

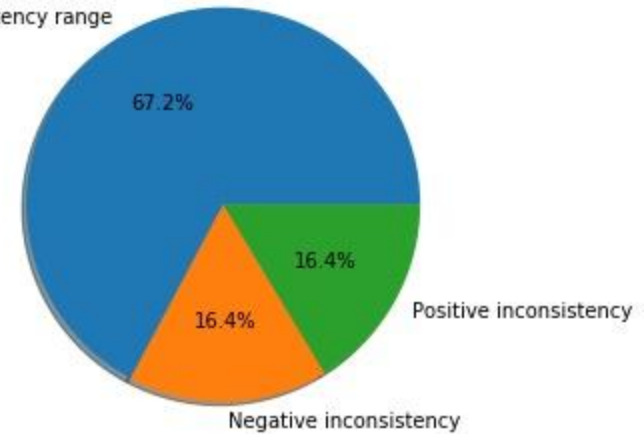
Electrical Engineering Course Consistency

With in the consistency range



CSE Course Consistency

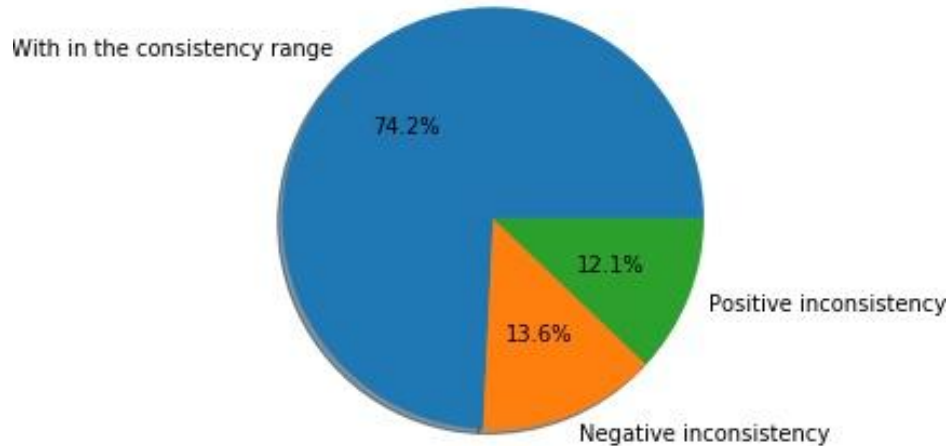
With in the consistency range



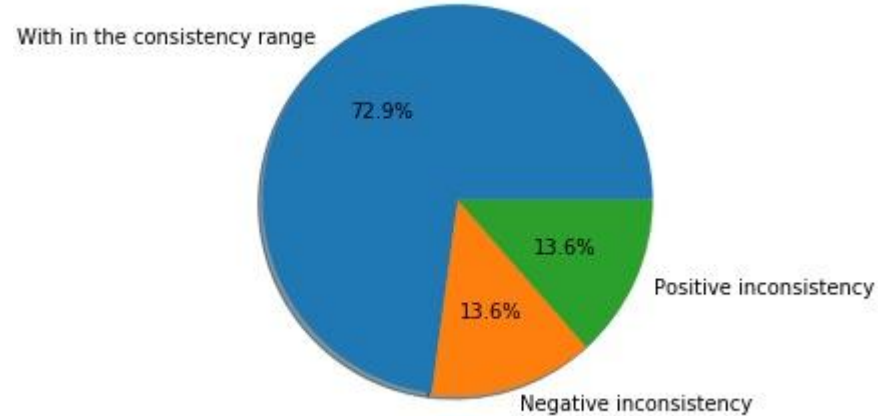
Course Consistency for MAE and BENG

- Consistency : How close is expected grade to the actual grade

MAE Course Consistency



BENG Course Consistency



Which Department is the Toughest Grader?

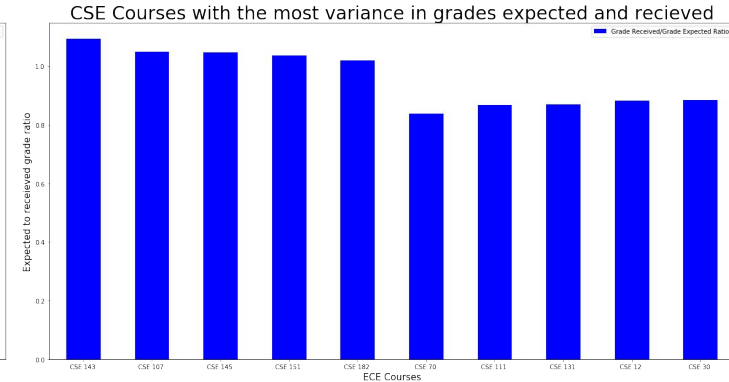
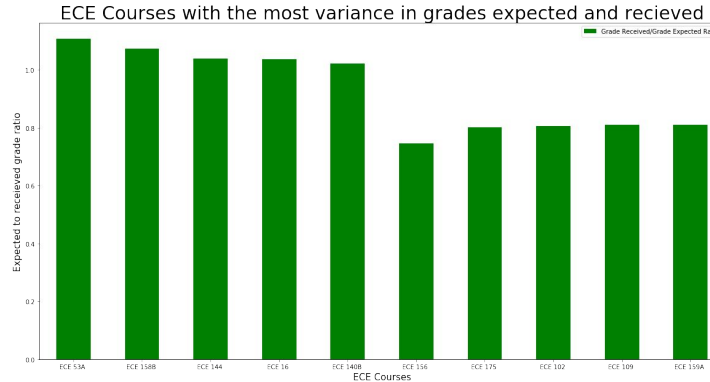
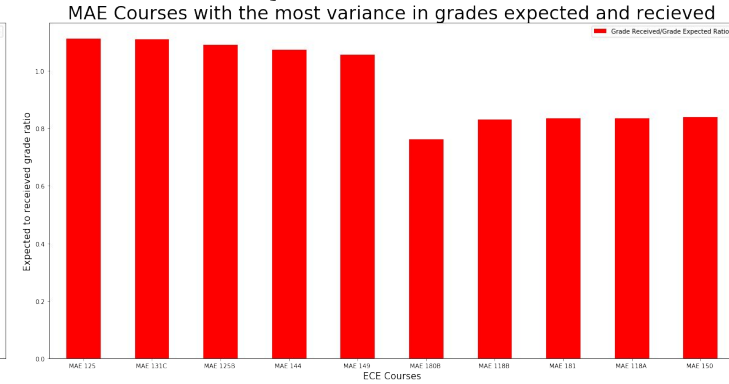
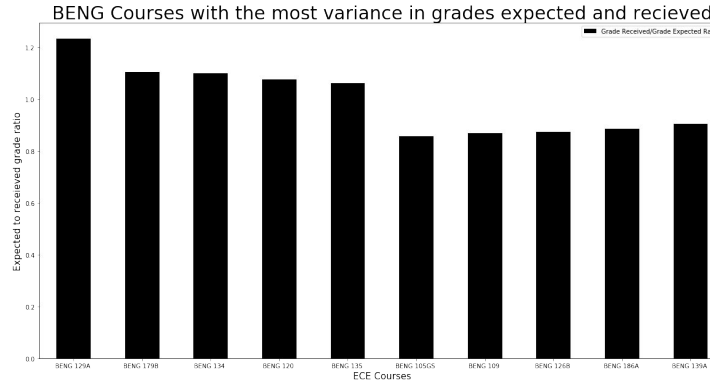
- Consistency:
 - How often do students actually get the grades they expect in each department?
 - Courses with ratios closest to 1 are “most consistent”
- Results depend on:
 - Student feedbacks
 - Average of grades for all the unique courses
- Order of grading easiest to toughest:
 1. MAE
 2. BENG
 3. ECE
 4. CSE

Easiest and Hardest Courses in Each Department:

- Engineering classes are HARD!
- Our definition of a tough class:

- Students received lower grade than they thought they would
- More study hours
- Larger class size

- ECE:
 - ECE153A | 156**
- MAE
 - 125 | 180B**
- CSE:
 - CSE143A | CSE70**
- BENG:
 - 129A | 105GS**

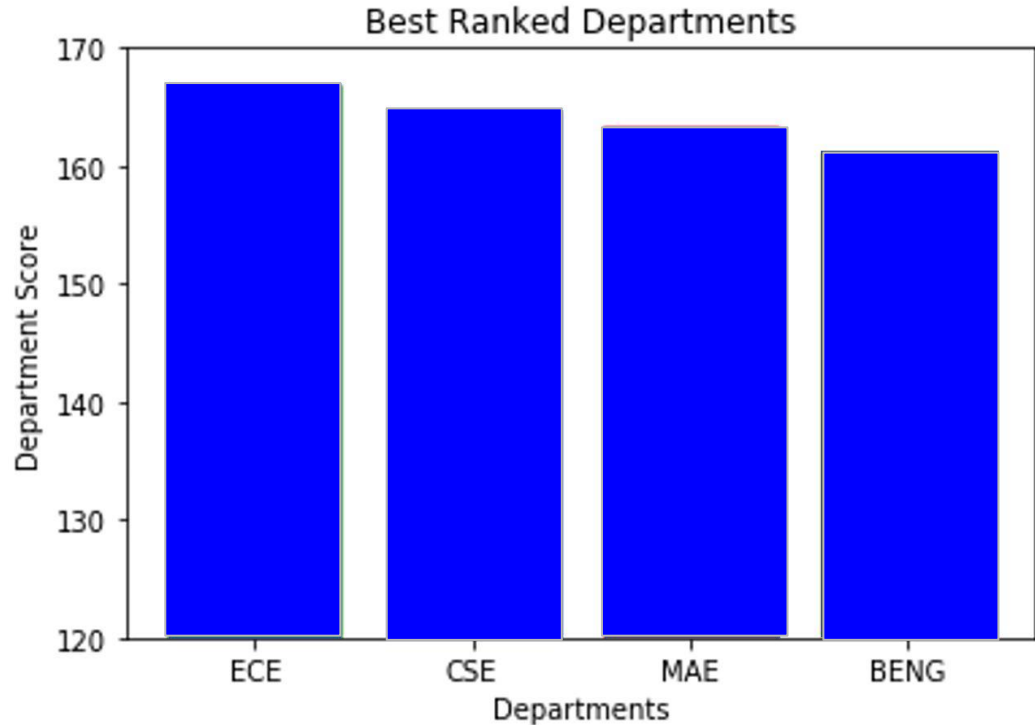


Overall Department Rankings

Calculated a “score” for each department:

avg of grades received + avg
instructor recommendation
percentage + avg course
recommendation percentage
- avg hours studied

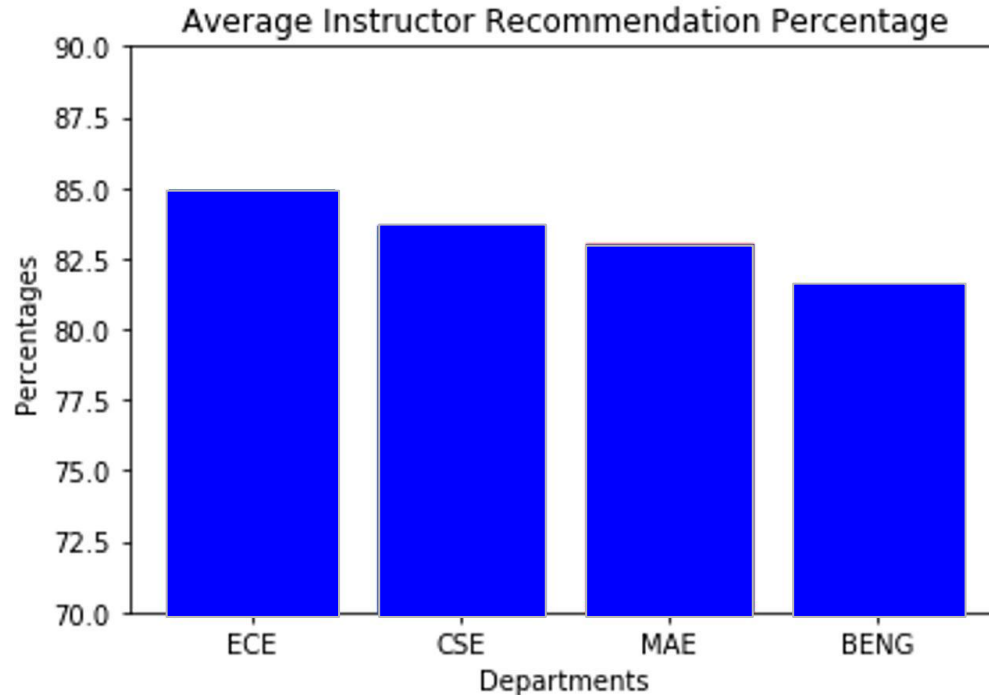
ECE Wins!



What Department Has the Highest Rated Instructors on Average?

The ECE department has the **highest recommendation percentage** on average.

The Bioengineering department has the **lowest** on average

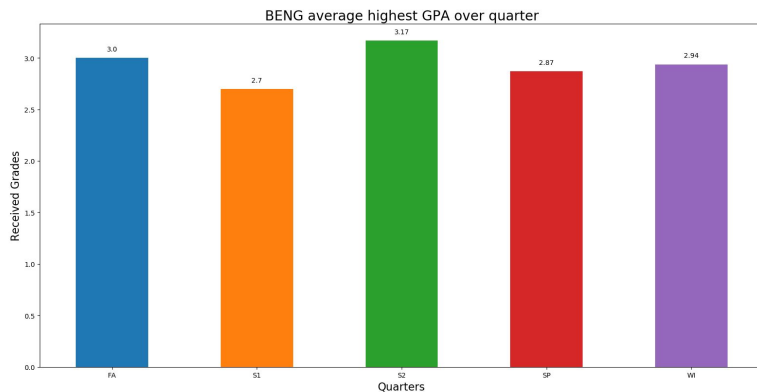


Quarter with lowest grades in each department

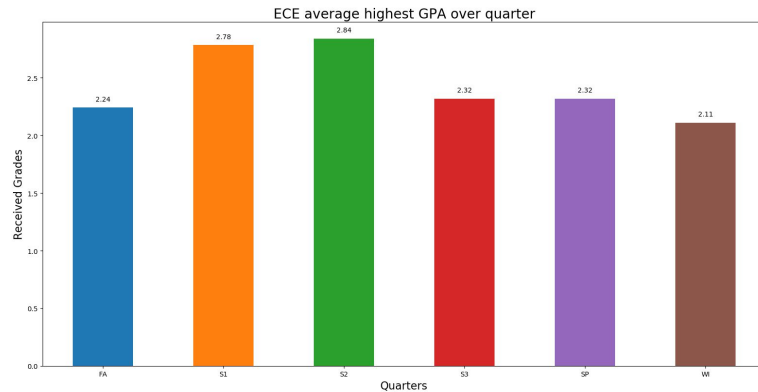
Lowest gpa in each quarter on average.

Winter has a lower gpa

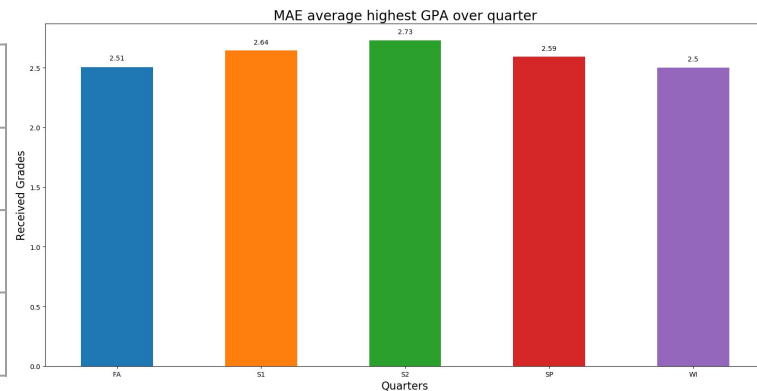
BENG



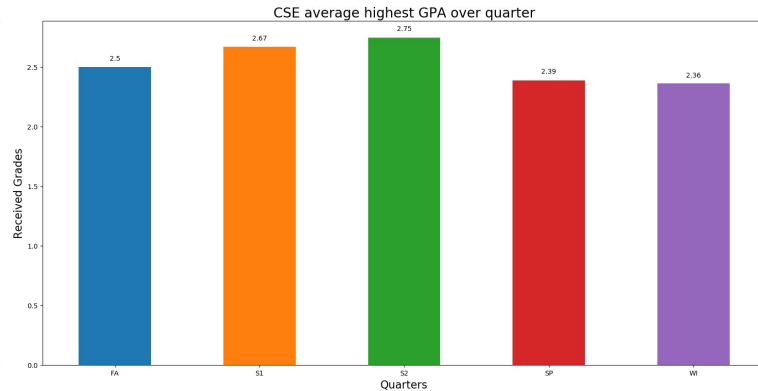
ECE



MAE



CSE

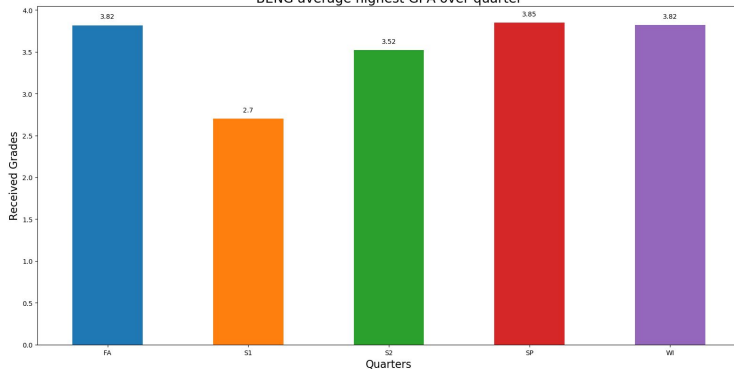


| | | |
|------|----|------|
| ECE | WI | 2.11 |
| CSE | WI | 2.36 |
| MAE | WI | 2.5 |
| BENG | S1 | 2.7 |

Quarter with Highest Grades in each Department

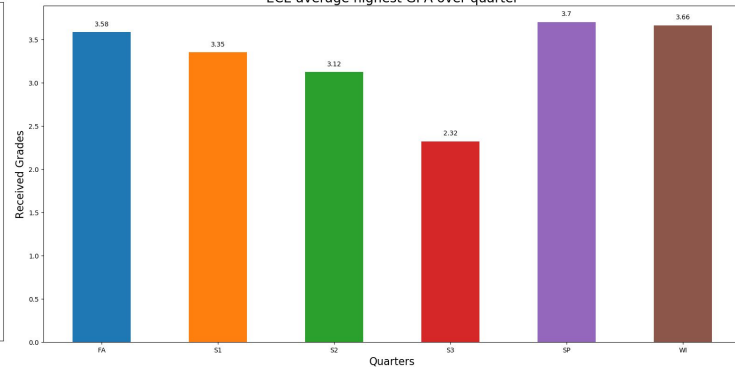
BENG

BENG average highest GPA over quarter



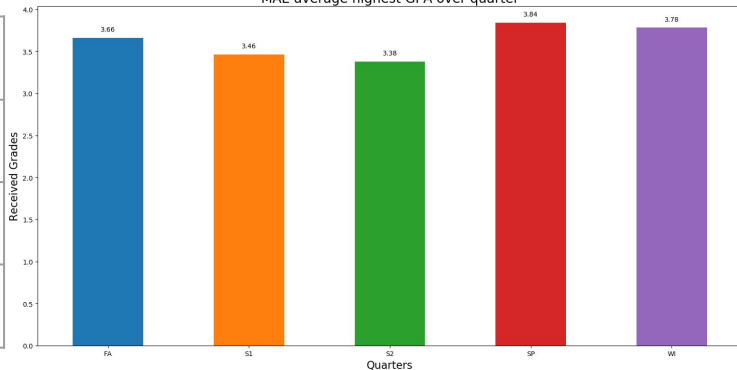
ECE

ECE average highest GPA over quarter



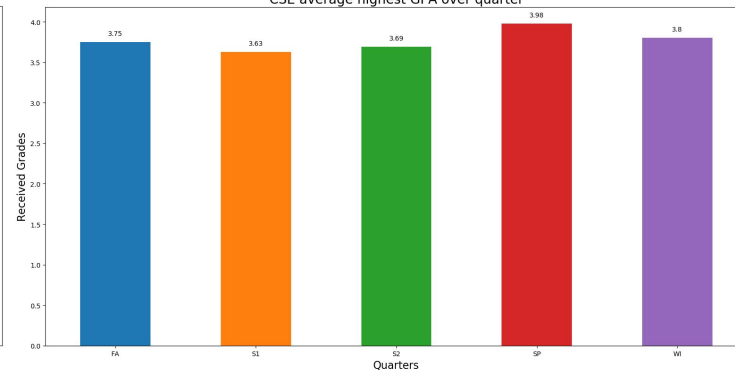
MAE

MAE average highest GPA over quarter



CSE

CSE average highest GPA over quarter



Highest gpa in each quarter on average.

Spring has higher grades.

| | | |
|------|----|------|
| ECE | SP | 3.7 |
| CSE | SP | 3.98 |
| MAE | SP | 3.84 |
| BENG | SP | 3.85 |

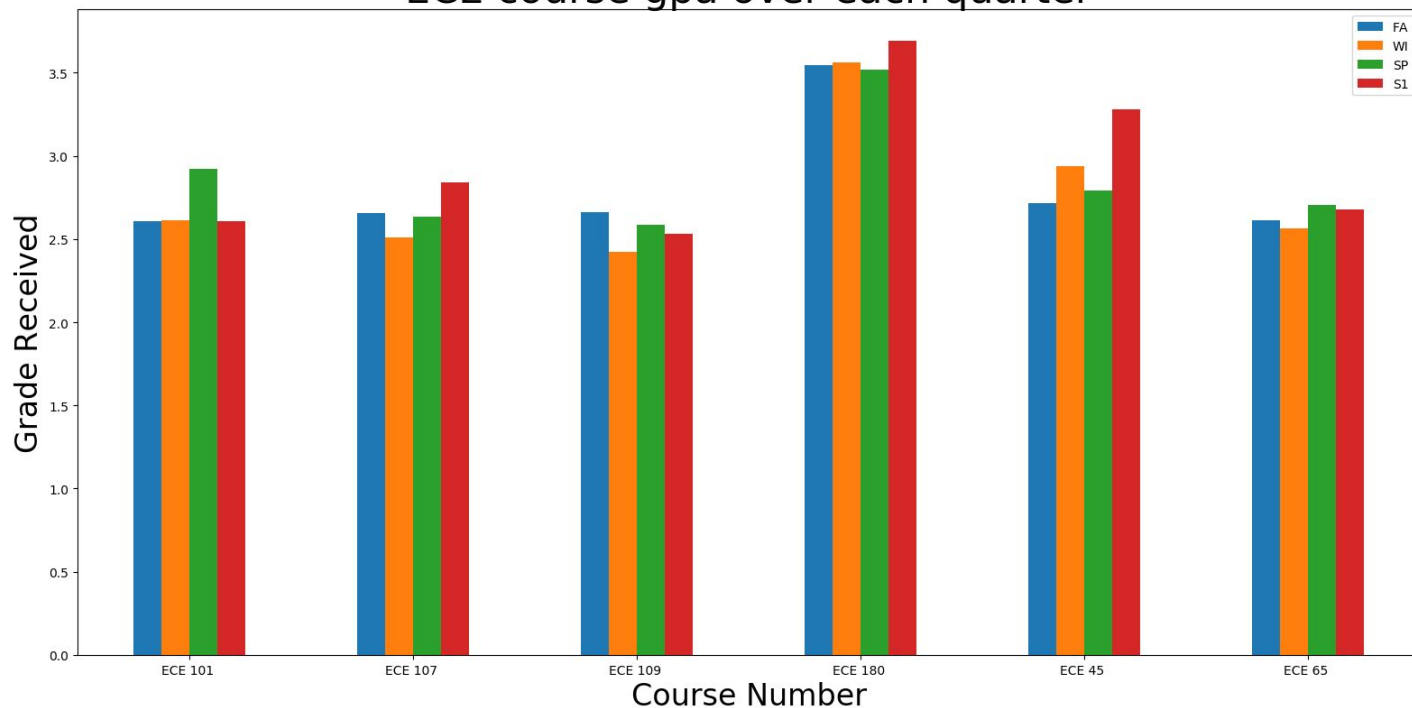
Is It True That Classes are Easier If Taken during Summer?

- Let's take a look at each of the common courses!
- Common Courses: Courses that appeared in fall, winter, spring quarter and summer sessions.

Is It True That ECE Classes are Easier if Taken during Summer?

Grades in summer are **highest for 50%** Courses

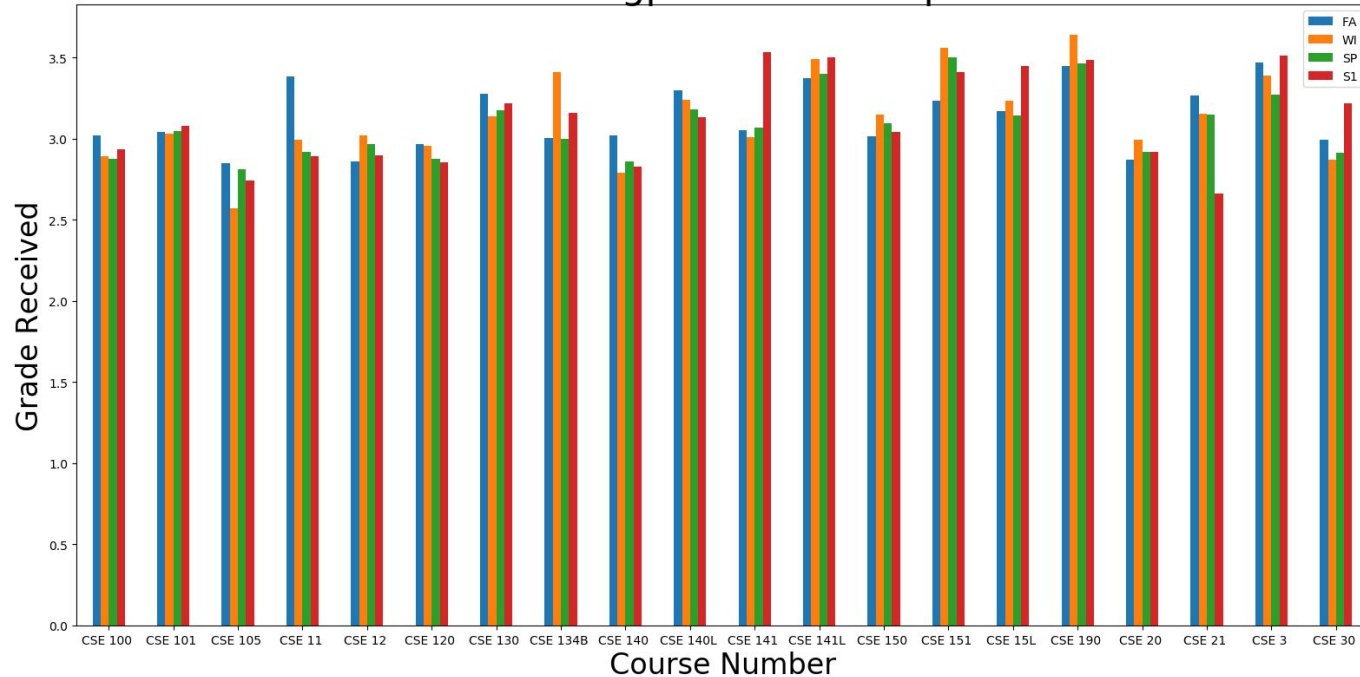
ECE course gpa over each quarter



Is It True That CSE Classes are Easier if Taken during Summer?

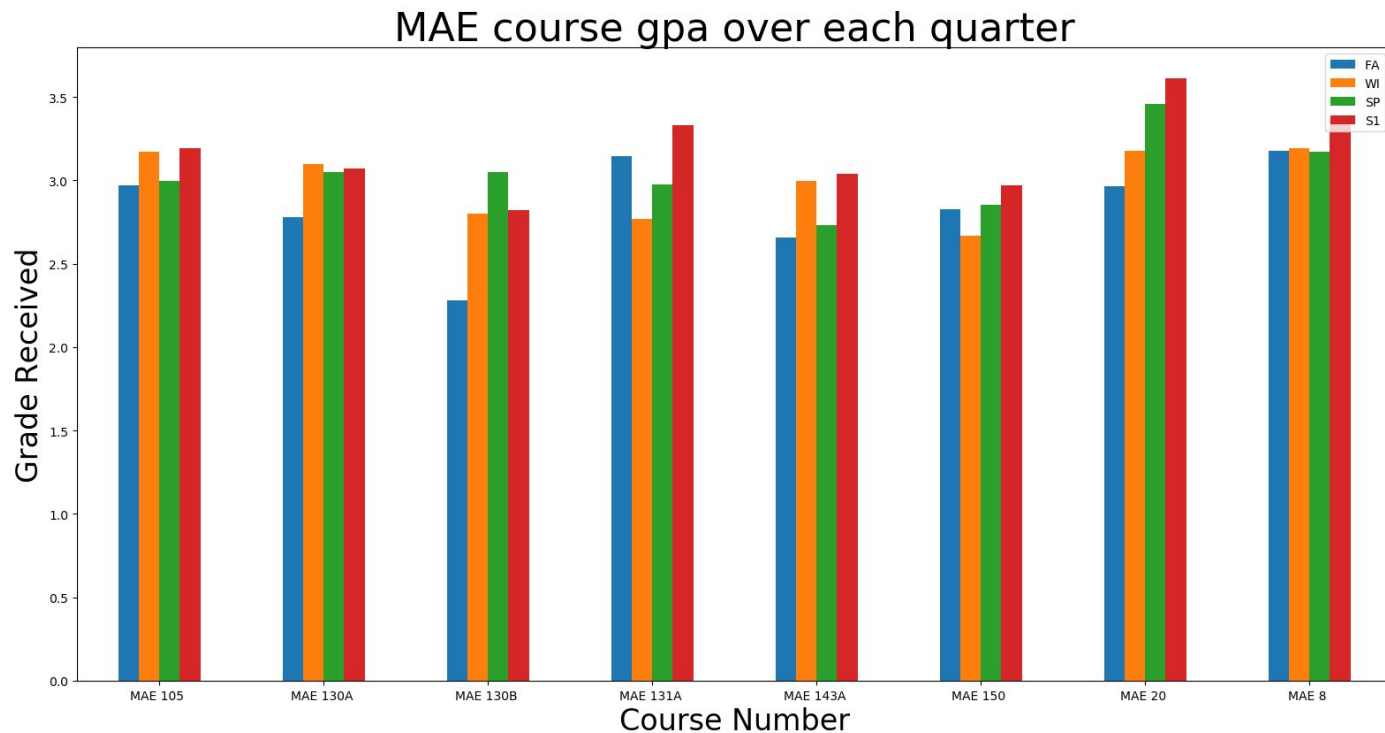
Grades in summer are **highest for 30%** Courses

CSE course gpa over each quarter



Is It True That MAE Classes are Easier if Taken during Summer?

Grades in summer are **highest for 75%** Courses



Is It True That Classes are Easier If Taken during Summer?

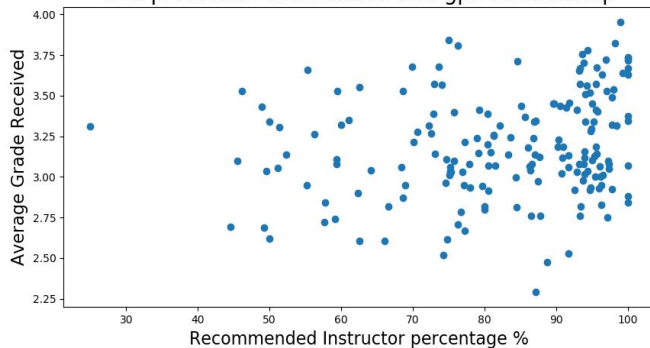
- True for 15 out of 34 courses
- Higher probability in ECE and MAE, less true in CSE
- Still depends on professor and students
- BENG has less data in summer so no result

Is There a Relationship Between Grade Received and Whether the Professor is Recommended?

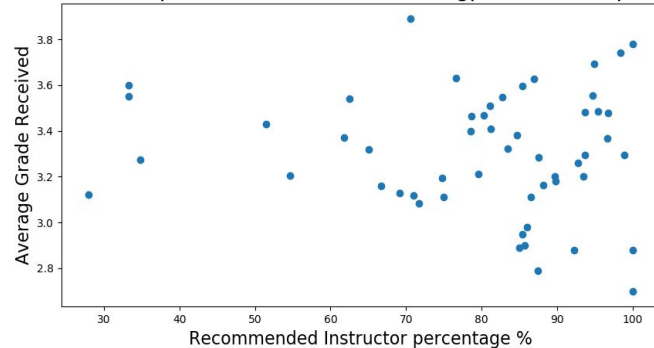
High professor recommendation does **not necessarily** lead to a high grade received

| Department | Correction |
|------------|------------|
| ECE | 0.197 |
| CSE | 0.198 |
| MAE | 0.249 |
| BENG | -0.091 |

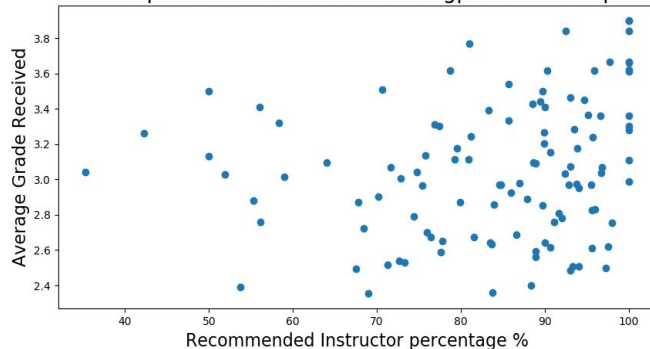
CSE professor recommended and gpa relationship



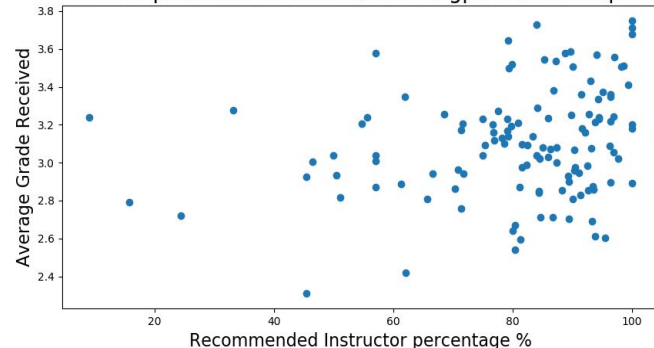
BENG professor recommended and gpa relationship



ECE professor recommended and gpa relationship

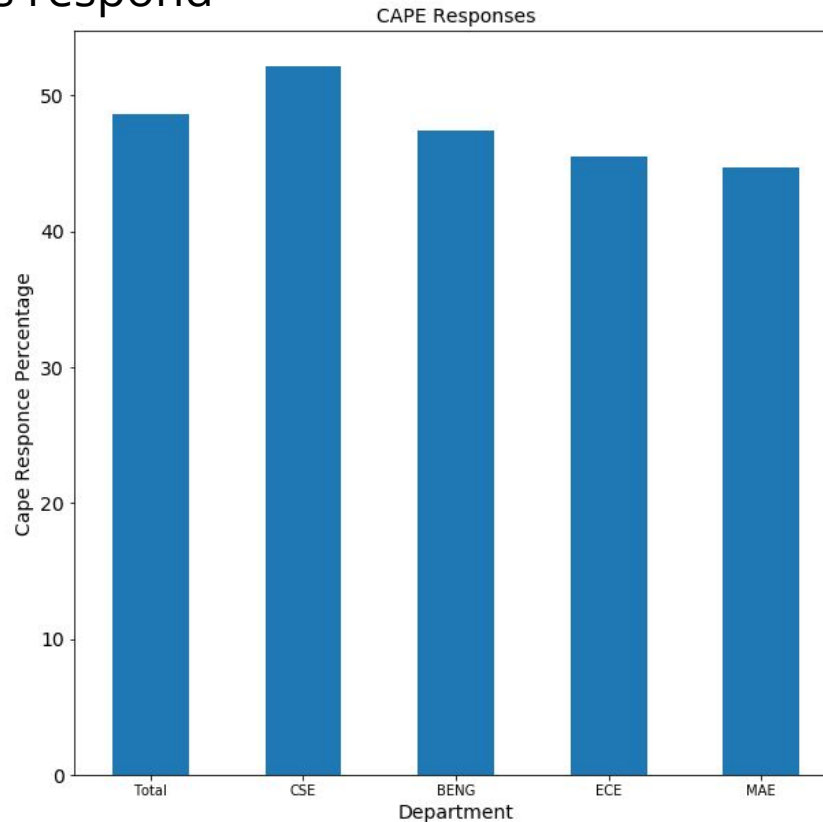


MAE professor recommended and gpa relationship



CAPE's Feedback Count

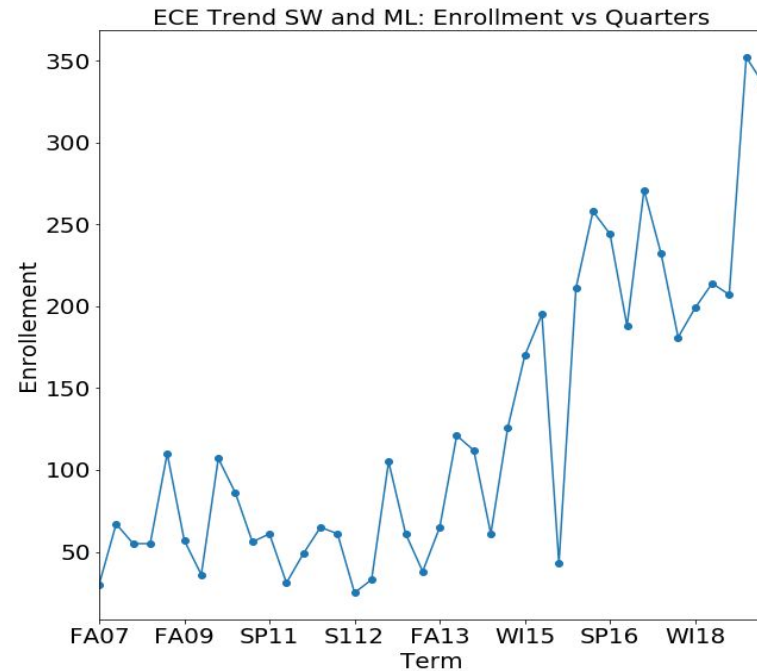
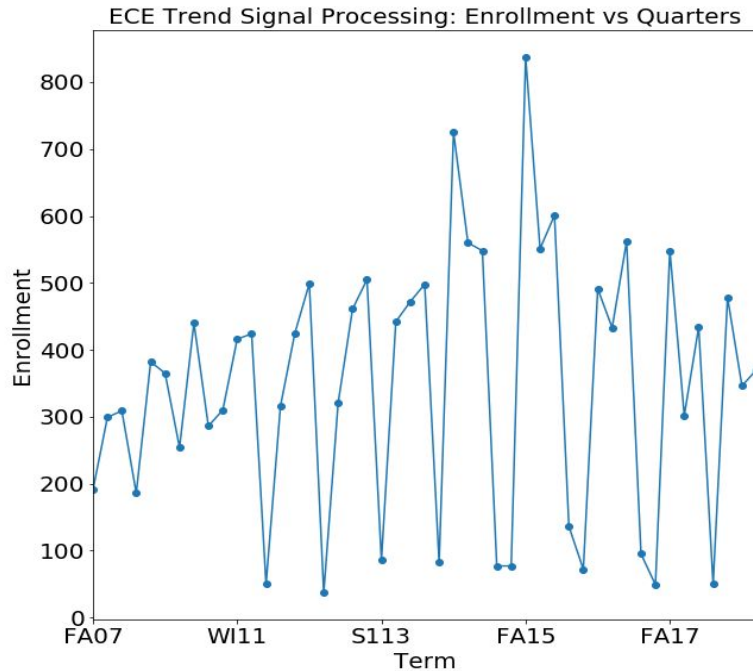
- Only ~50% students respond



Largest Deviation in GPA Expected and Received

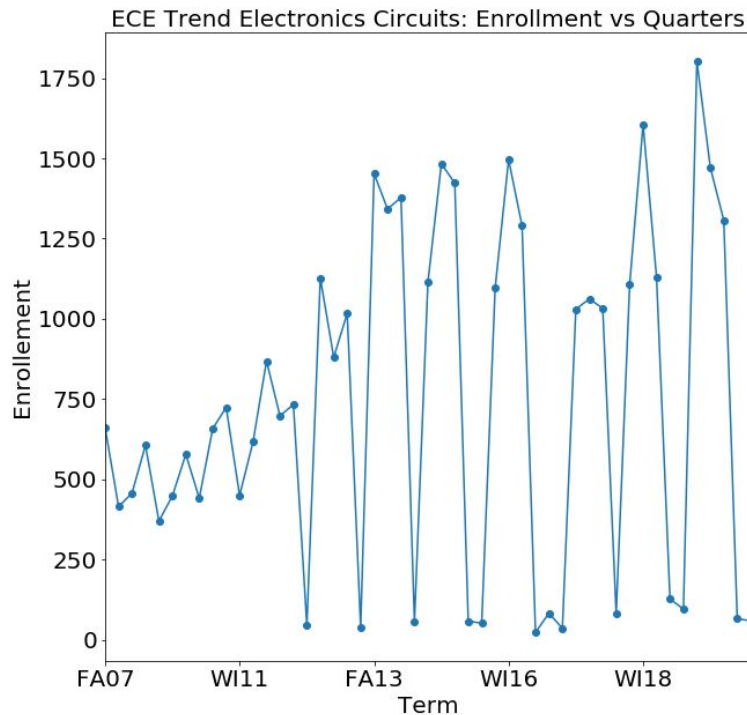
| ECE | Deviation | CSE | Deviation | MAE | Deviation | BENG | Deviation |
|------------|------------------|------------|------------------|------------|------------------|-------------|------------------|
| ECE 156 | 1.42 | CSE 140 | 1.32 | MAE 110A | 1.23 | BENG 100 | 0.76 |
| ECE 65 | 1.37 | CSE 8AL | 1.11 | MAE 20 | 1.11 | BENG 140A | 0.72 |
| ECE 164 | 1.32 | CSE 11 | 1.04 | MAE 140 | 1.09 | BENG 140B | 0.71 |
| ECE 35 | 1.23 | CSE 140L | 1.03 | MAE 105 | 1.05 | BENG 186A | 0.71 |
| ECE 109 | 1.18 | CSE 191 | 1.0 | MAE 101C | 1.03 | BENG 129A | 0.68 |
| ECE 154B | 1.10 | CSE 140 | 1.0 | MAE 120 | 1.03 | BENG 109 | 0.68 |

Interesting Trends in ECE Specializations 1



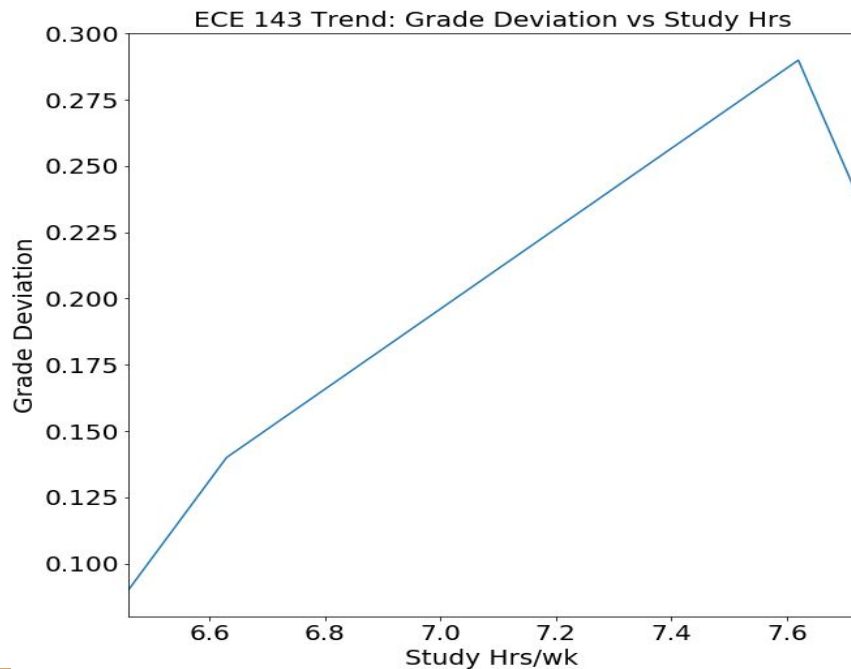
- Since 2015 a drop in the enrollment for traditional signal processing courses
- Software and Machine Learning courses receiving more attention!

Interesting Trends in ECE Specializations 2

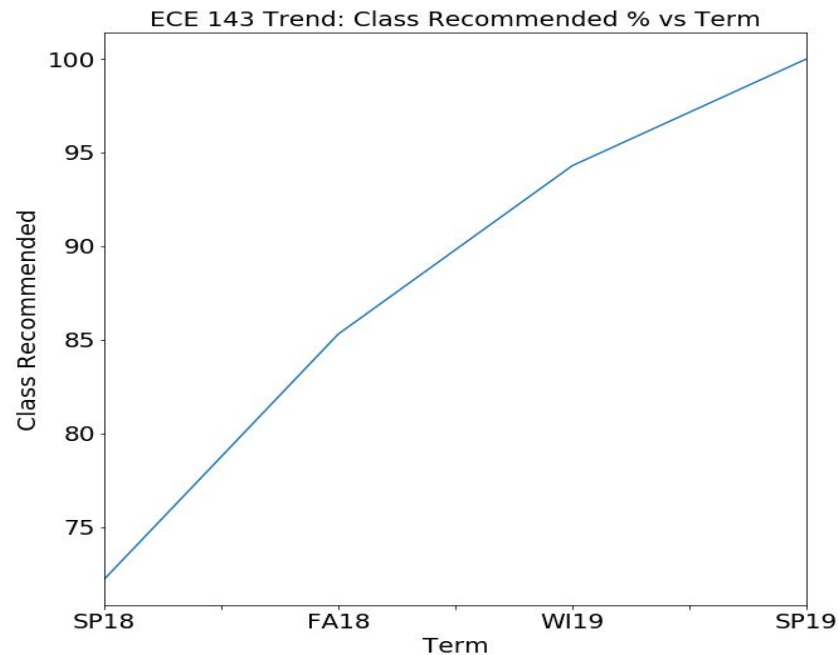
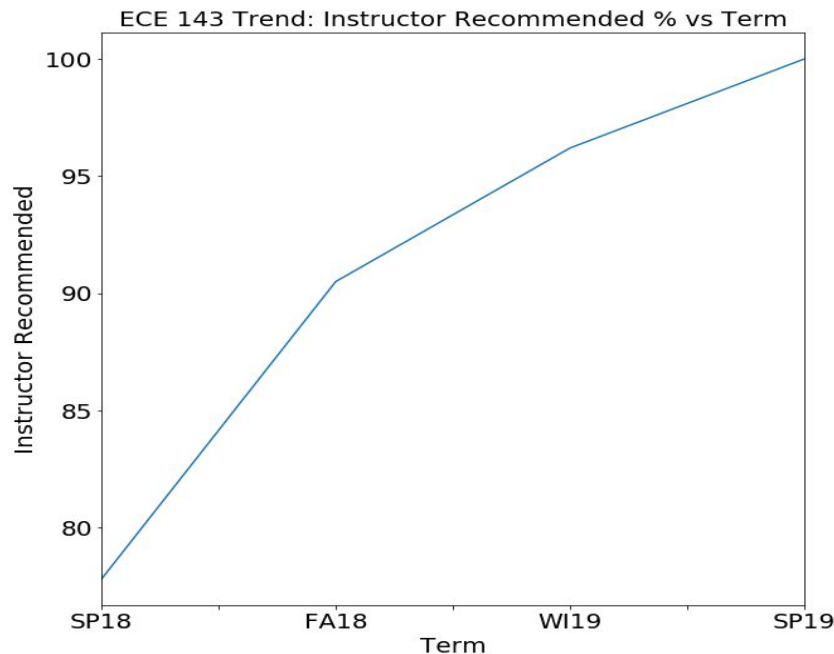


ECE 143 Grade Deviation Insights

- Grade Deviation = Grades Received - Grades Expected
- Effort Getting Paid Off!



ECE 143 Course Quality Insights



- Course quality increasing!

Overall Conclusions

- Overall, CAPEs provide high quality information about courses and instructors in the School of Engineering
- Grade expectations are mostly consistent
- Please fill out your CAPEs at the end of the quarter!



Thank
you!