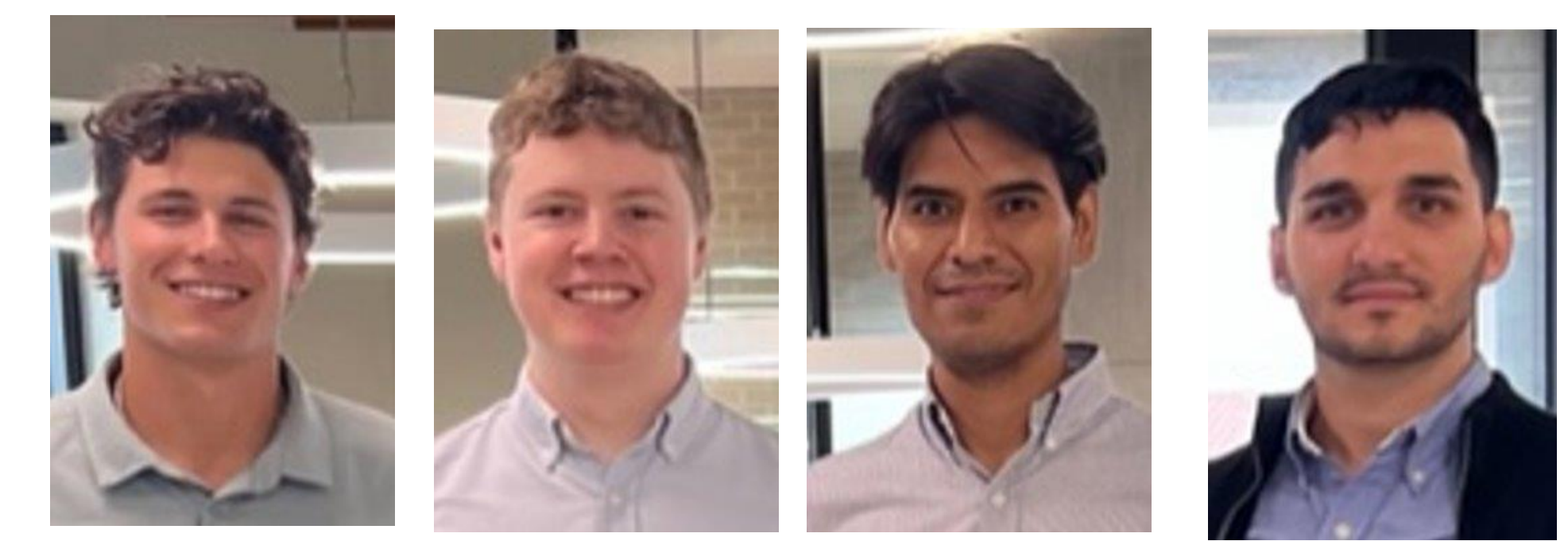


# 12.03 Capacity Planning

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## What Is Capacity Planning?

- Capacity planning is the process of balancing available resources to meet consumer demand in the most optimal way possible.

## Background:

- The Ingram School of Engineering is experiencing a growth period.
- New CE and ME programs are in place and are now also vying for available department resources.
- New ME program received double the anticipated enrollments for the current semester.

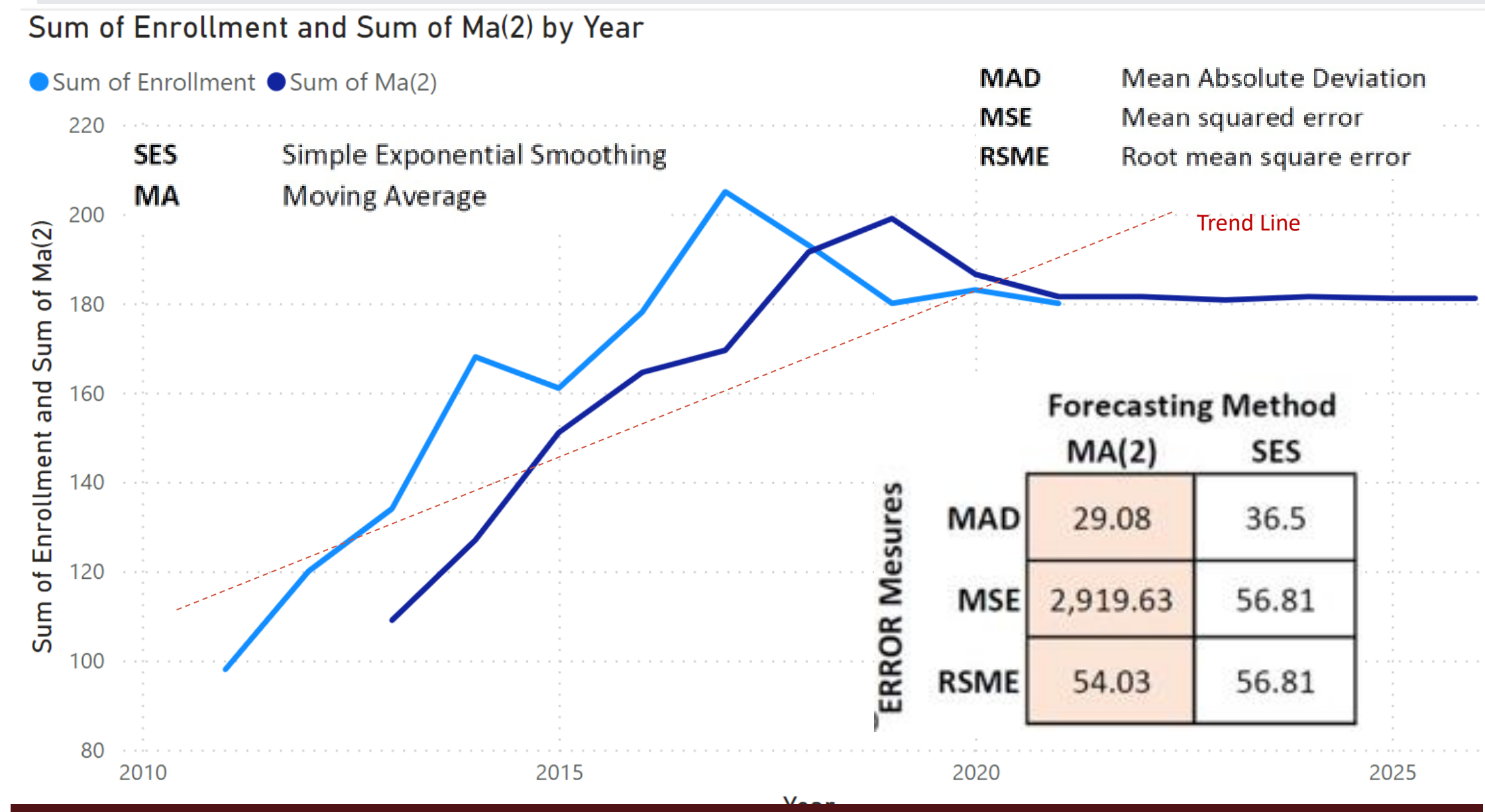
## Objectives:

- Implement time-series analysis to effectively forecast the growth for each program discipline.
- Develop an optimal way to allocate the number of class sections that should be offered every semester.
- Investigate student retention and how graduation rates may be affected.

## Human Factors:

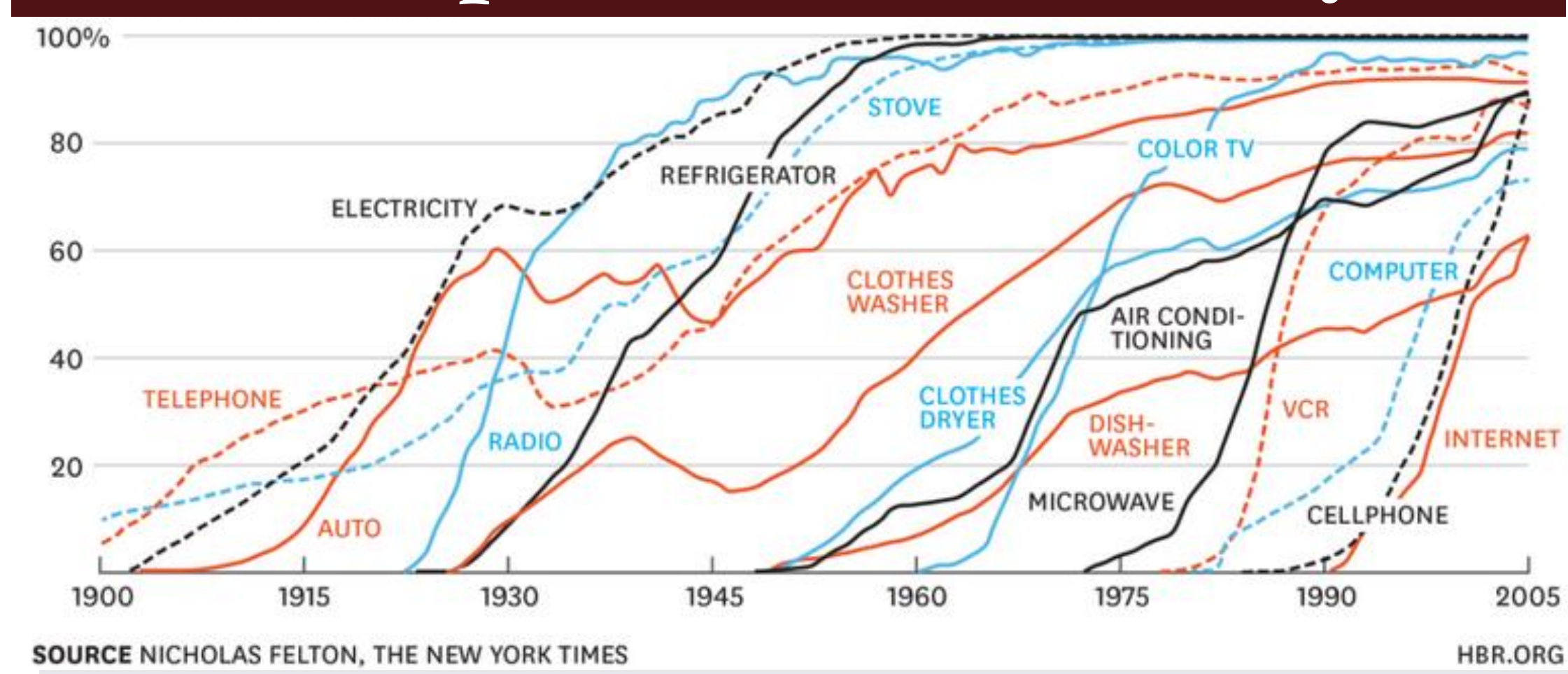
- By implementing our models and data visualization and management system the user needs only to input enrollment data and export the required results.
- A standard operating procedure ensures our methods can be extended to any new disciplines or building requirements.
- Optimized scheduling can help alleviate fatigue and stress on students, faculty and staff by balancing workloads, reducing both overworked lecturers and wasted lecture time.

## Fixing Capacity With Improved Course Scheduling:

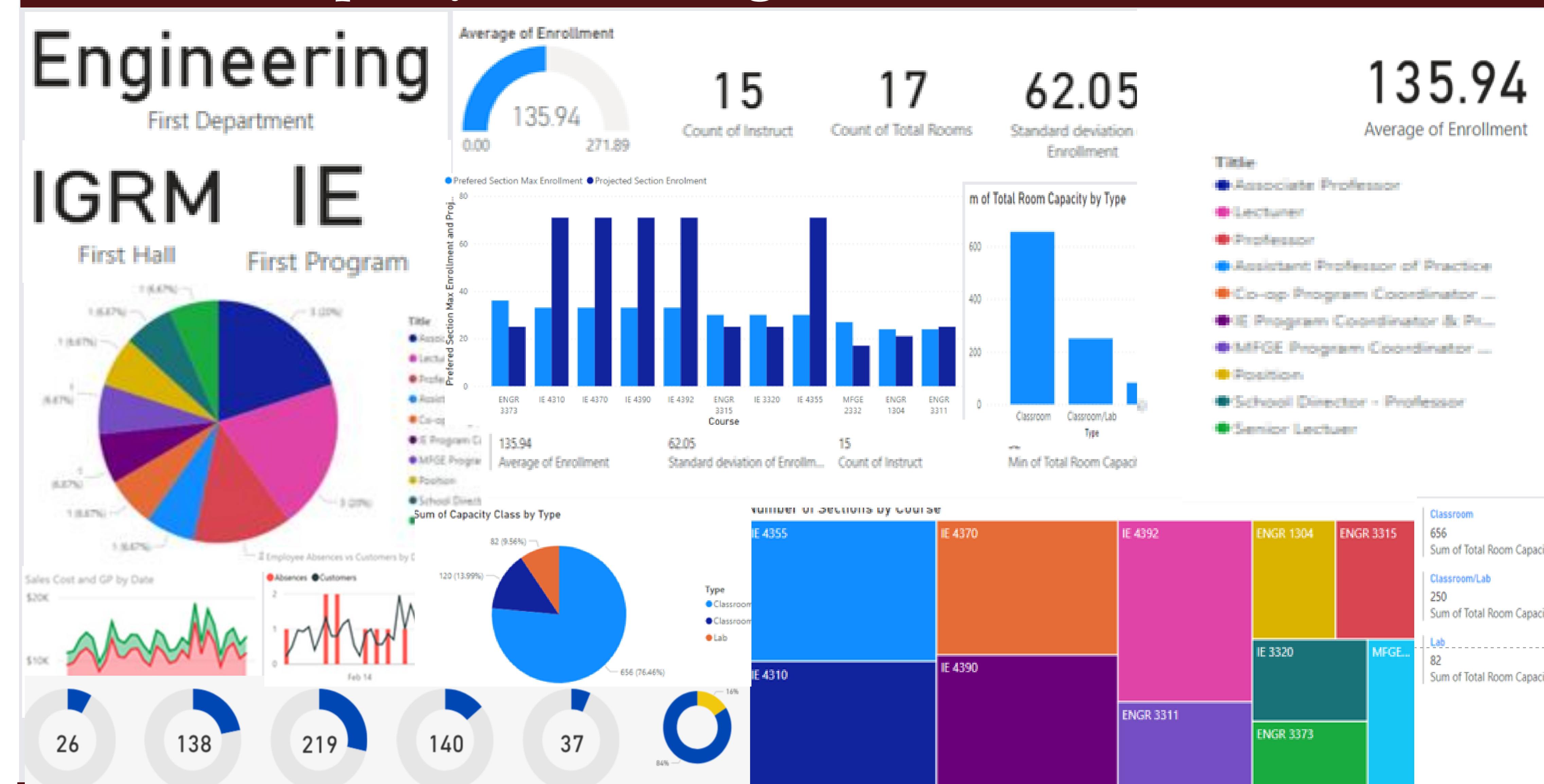


- Building space usually isn't the issue.
- Four-year public universities used classrooms to capacity less than half of the time during a standard week<sup>1</sup>.
- Universities were more likely to have underutilized courses by 36 percent or overloaded classes by 33 percent when compared to those courses that effectively balanced seat supply with student demand<sup>1</sup>.
- Universities need to re-examine and understand their student enrollment data to better understand how courses should be scheduled in order to address potential bottlenecks or capacity problems.

## Examples From Industry:



## Capacity Data Management & Visualization:



## Programming & Software Packages:



## Methodology:

- Define:** Datasets. Collect data and investigate best methods of practice.
- Measure:** Utilize Simple Exponential Smoothing models and Simple Moving Average forecasting methods.
- Analyze:** Use error measures to identify the accuracy of our results.

## What's Driving Growth?

- Texas Population:** Texas' growth rate of 15.9% is more than doubled the growth rate of the nation (7.4%).
- Demand for STEM:** Entire Texas middle-skill STEM workforce is projected to increase by 24 percent to nearly 1.5 million workers in the next decade.
- New Program Concentrations:** New Engineering programs and concentrations will continue to attract new enrollments and help fuel future growth at TXST.

## Future Projects:

- Investigate current student-to-teacher ratios across disciplines.
- Examine the impact of the current student-to-teacher ratio on retention and graduation rates.
- Effectively forecast future building capacity requirements: Time for a new building?

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