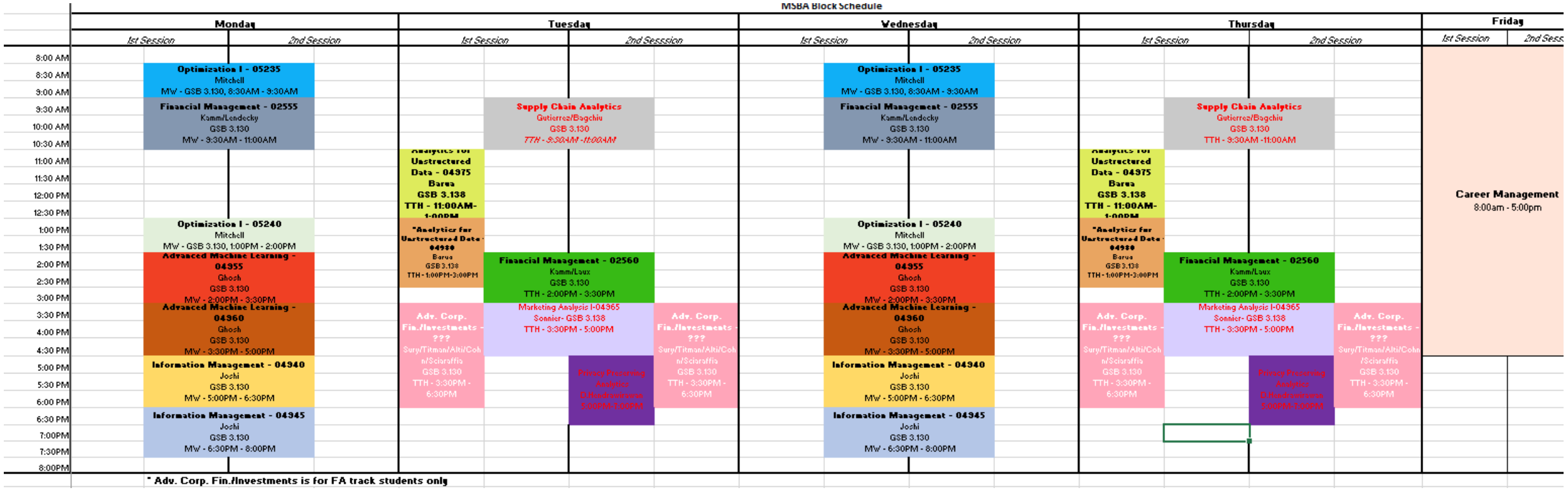
TEXAS
The University of Texas at Austin

TOPIC 0 INTRODUCTION

Syllabus

- Let’s go over the syllabus together
- Office hours



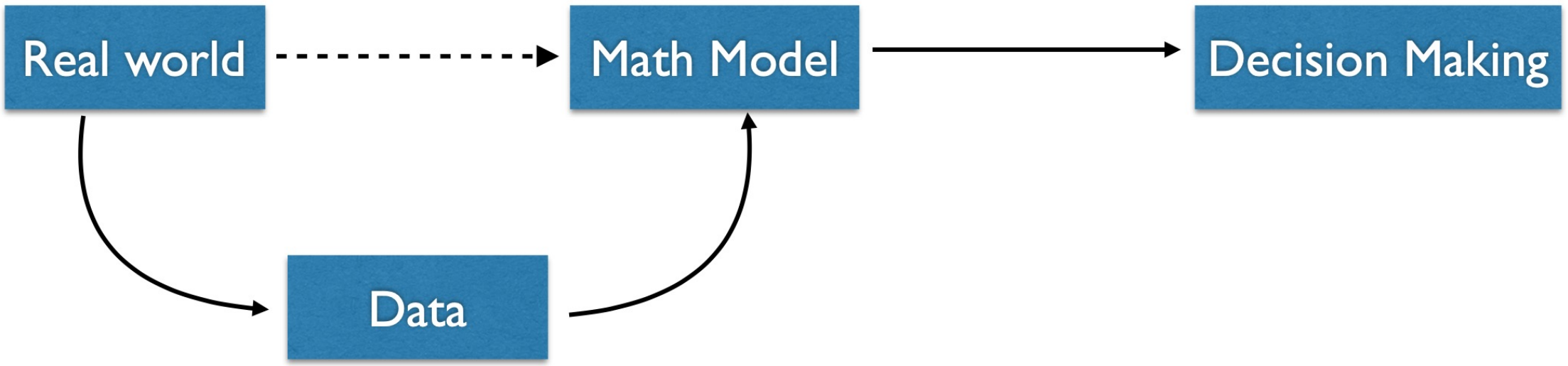
Teaching

- From “How” to “Why”
- My objective
  - To HELP you learn the material in such a way that the concepts and intuition stay with you forever
- My constraints
  - Fairness
  - University imposed constraints

Course Description

- Applying advanced quantitative methods to help make better business **decisions**.
- Specifically: Linear, Integer, and Non-linear programming
- Applications will include
  - marketing, finance, revenue management, etc.
- The concepts and methods you learn in this class are useful in several areas. Hence the tools you will learn will be useful regardless of your specific interests.

Real World → Decision Making



Optimization is Everywhere

- Personal Choices
  - saving for retirement
  - how to spend money renovating a house
- Decision making in a firm
  - optimal mix of products for customers
  - minimizing production or inventory costs
  - maximizing value of marketing
  - pricing and scheduling crew for airlines
- Statistics/Machine Learning
  - Fitting a model
- Other examples
  - shortest path on online maps
  - artificially intelligent games
  - traffic lights

Outline of Semester

- Linear Algebra (MAYBE)
- Linear Programming
- Integer Programming
- Non-Linear Programming and Neural Nets
- You can find classes at UT that spend an entire semester on each of these topics
  - This will mostly be a survey course on modeling techniques, then we'll rely of software to solve the problems for us

Next Semester

- Next semester we're going to build towards reinforcement learning
  - Simulation
  - Stochastic programming and bandit problems
  - Dynamic programming
  - Reinforcement learning