Status of Statistics Curricula in Canada

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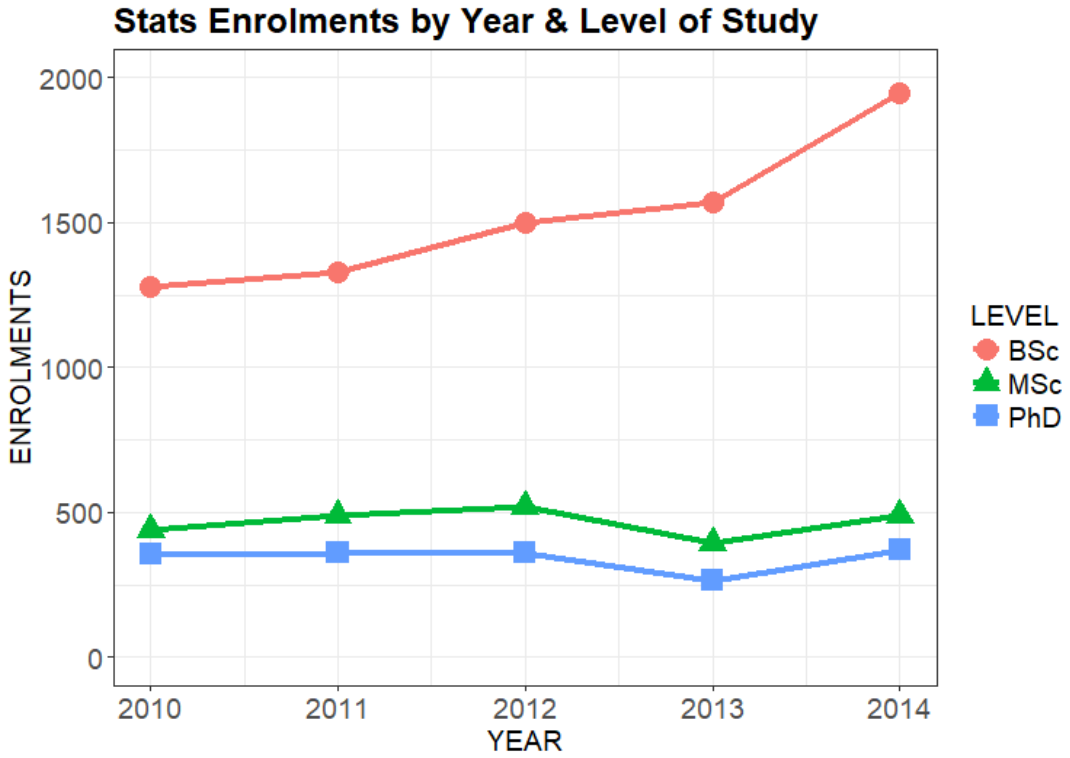
Data Sources

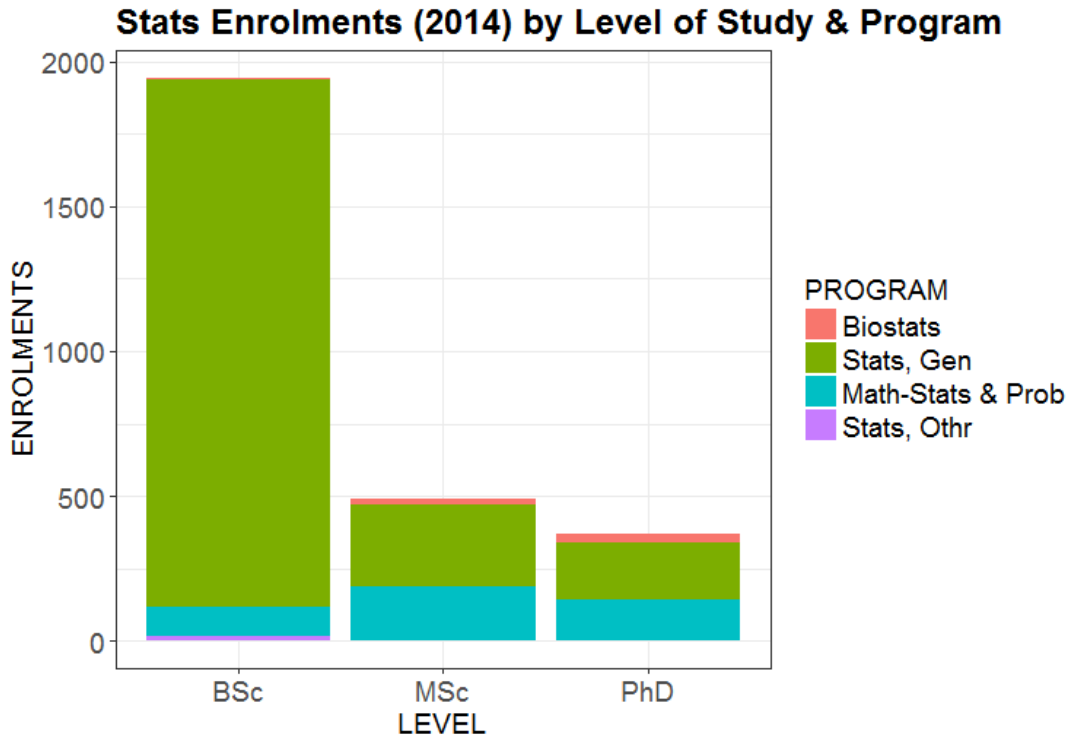
- Stats program enrolments/graduates: Postsecondary Student Information System (PSIS) survey, from Statistics Canada
  - Microdata available through StatCan's RTRA
- Stats program curricula: collected from universities' calendars
  - Many thanks to Olivia Rennie (UTSC NeuroSci BSc) for her help
- All data & code available through GitHub
  - https://github.com/damouras/SoSC

Stats Programs Vital Statistics

52% increase in Stats BSc enrolments (`10 to `14)

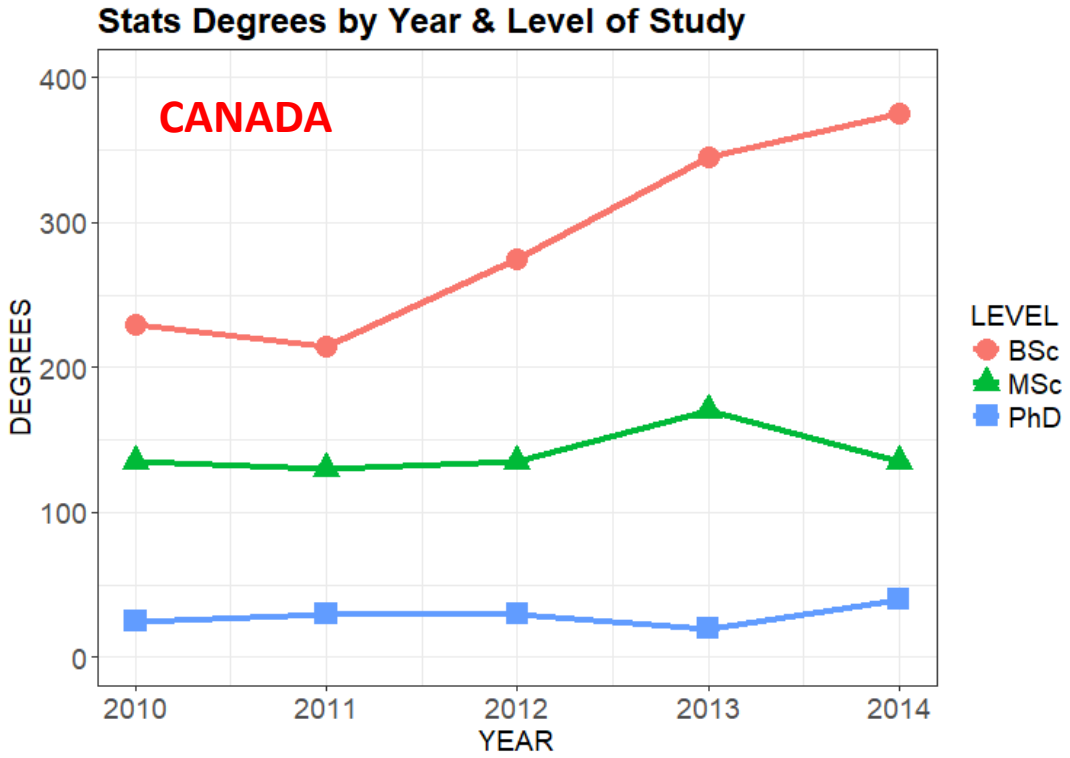


Majority of BSc's in General Statistics

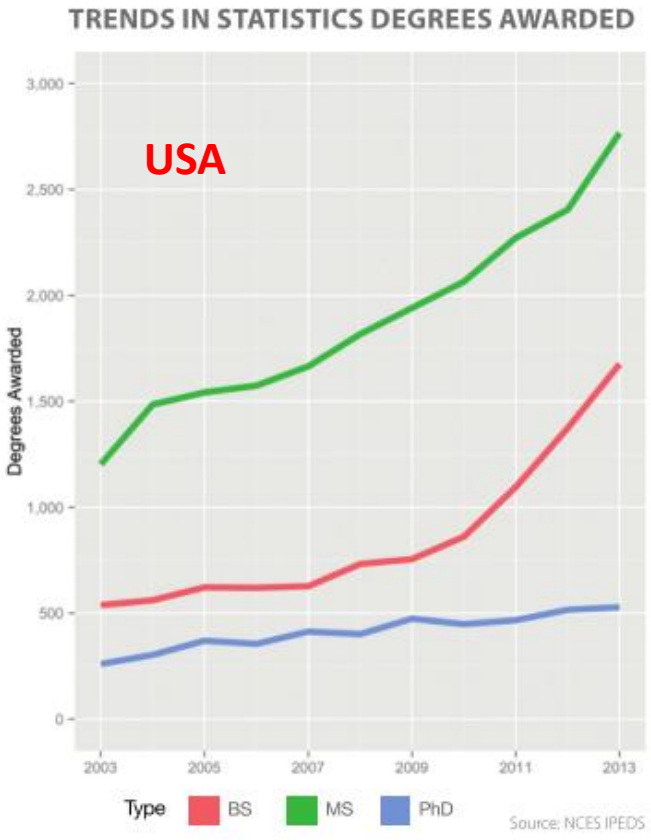


Stats Programs Vital Statistics

>2 times more BSc than MSc+PhD grads



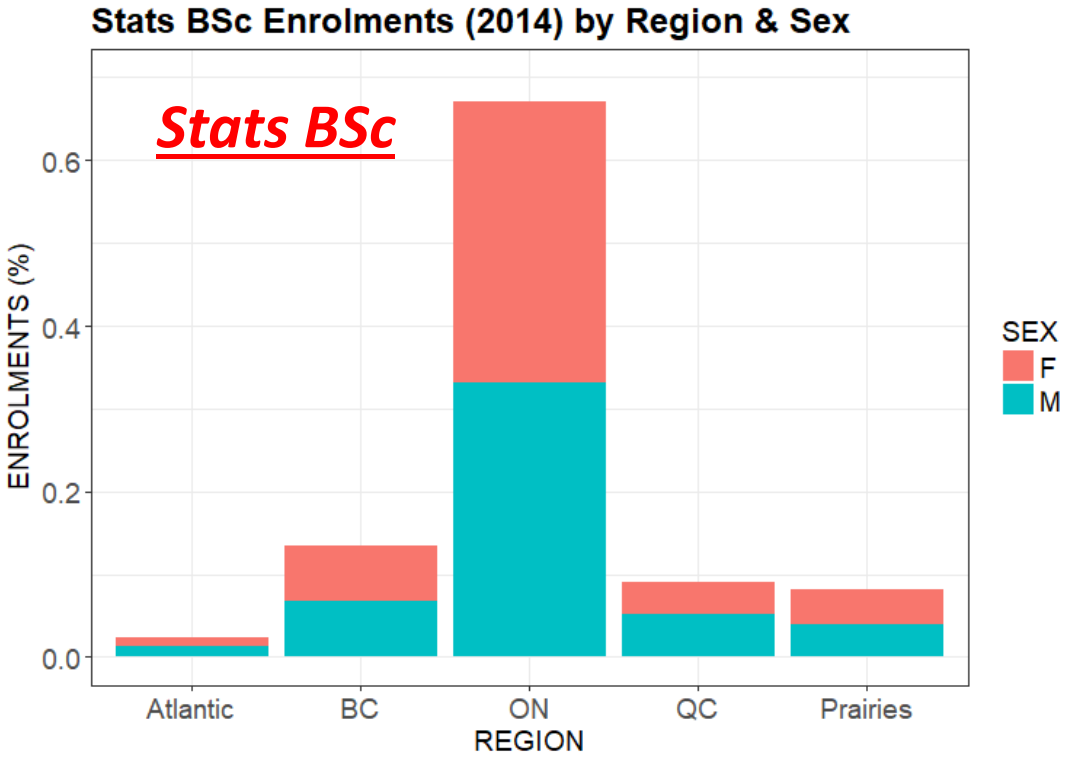
Different from US (where MSc > BSc)



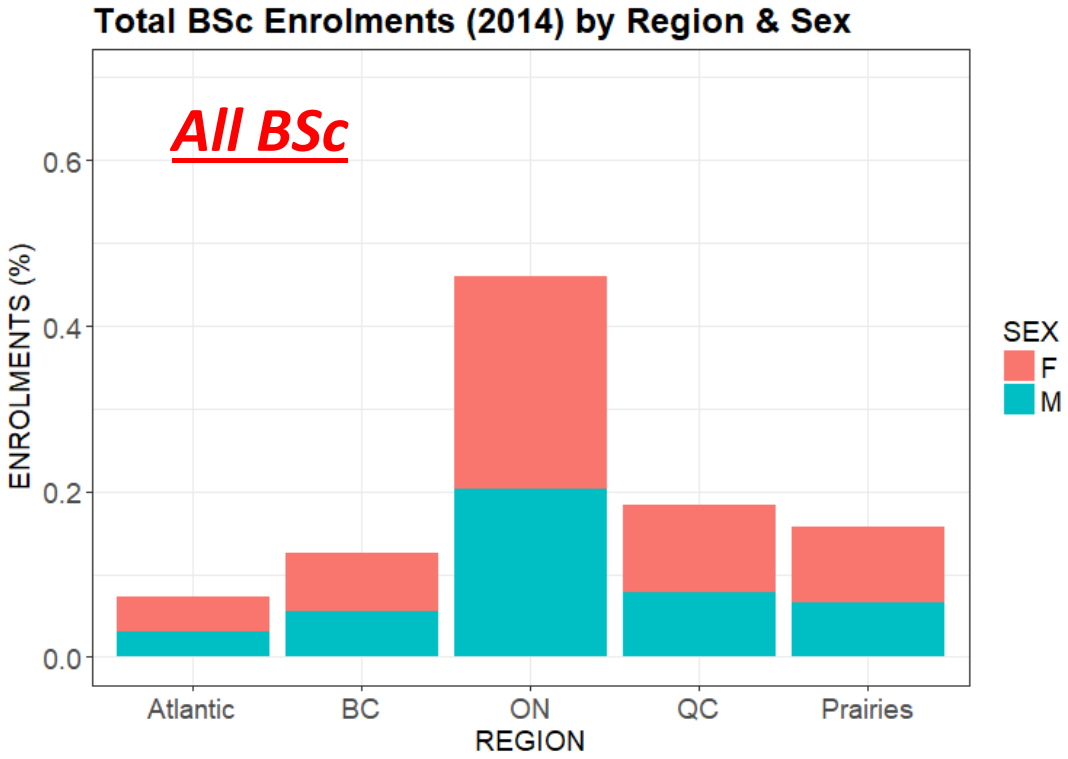
(reproduced from 2014 ASA *Curriculum Guidelines for undergraduate programs in statistical Science*)

Stats BSc Enrolment Breakdown

Gender Parity!!
(F/M = 970/975)

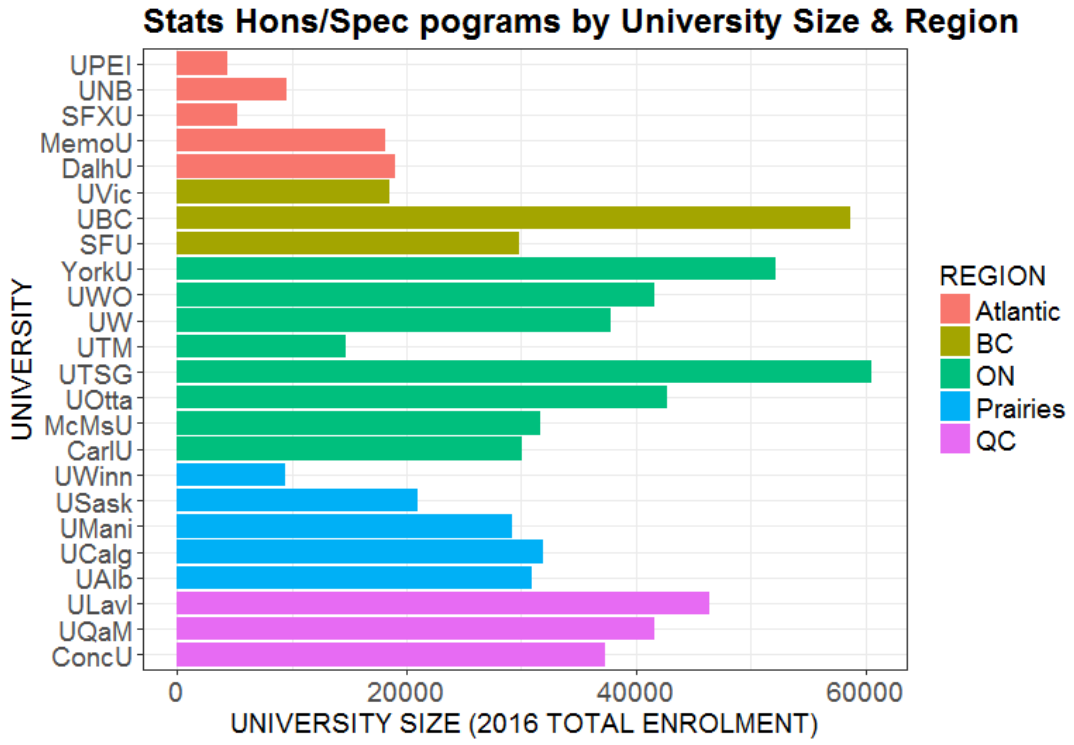


ON has relatively more Stats BSc's;
Atlantic/QC/Prairies have less



Stats Curricula - Target Population

- Consider only (pure) *Statistics Honours/Specialist programs*
  - Excludes Minor, Major, 3-yr BA/BSc, etc
  - Excludes programs not focused purely on Statistics (e.g. Probability & Statistics, or Mathematical Statistics)
- Analyzed programs from n=24 Universities

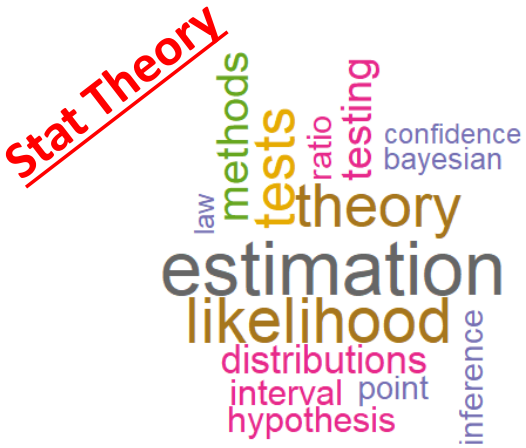


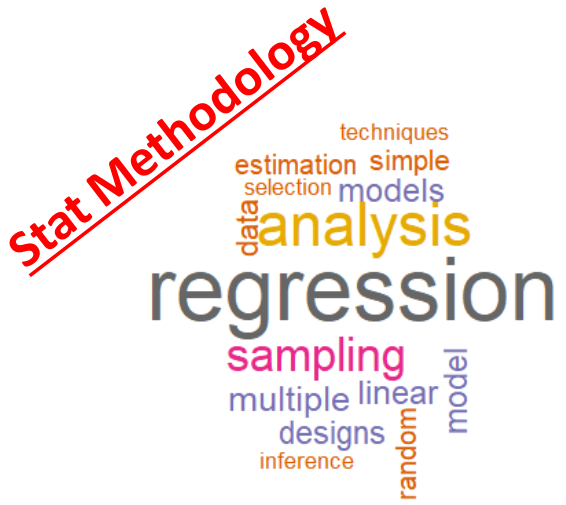
Stats Curricula - Variable Description

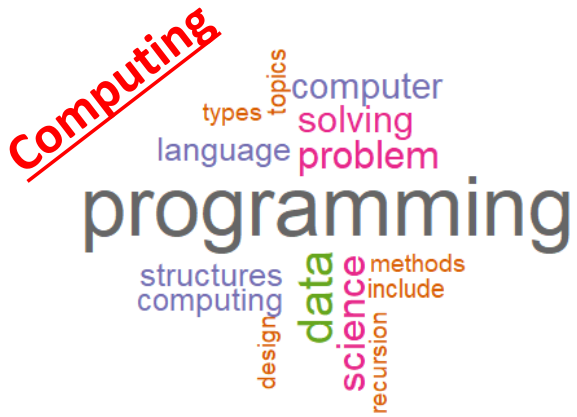
- For each course requirement, create the variables:
  - **Code**, **Title** & **Description**: copied from calendar
  - **Credits:** in full-course equivalents; i.e. 1-semester course = 0.5 credits
  - **Discipline**: department/discipline offering course
    - One of: *COMP*, *MATH*, *STAT*, or *OTHR*
  - **Level**: "year" in which course is offered (capped at 4)
  - **Type**: *Core* or *Elective* requirement
  - **Topic Category**: Multi-valued variable; (subjective) grouping of covered topics
    - *One or more* of:

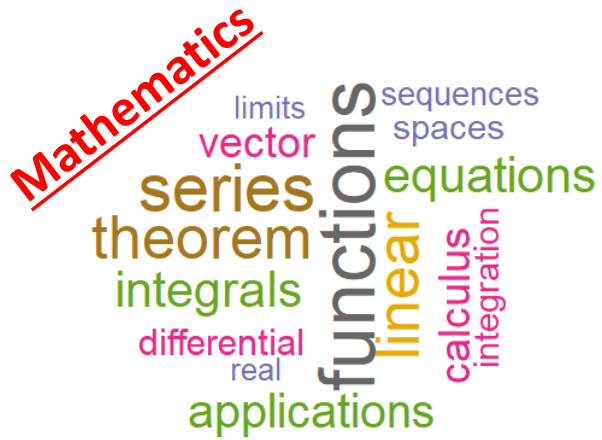
Statistical Theory (ST)	*Statistical Methodology* (SM)	*Statistical Practice* (SP)	
Mathematics (MT)	*Probability* (PT)	*Computing* (CS)	*Other* (OT)

Topic Category Word Clouds



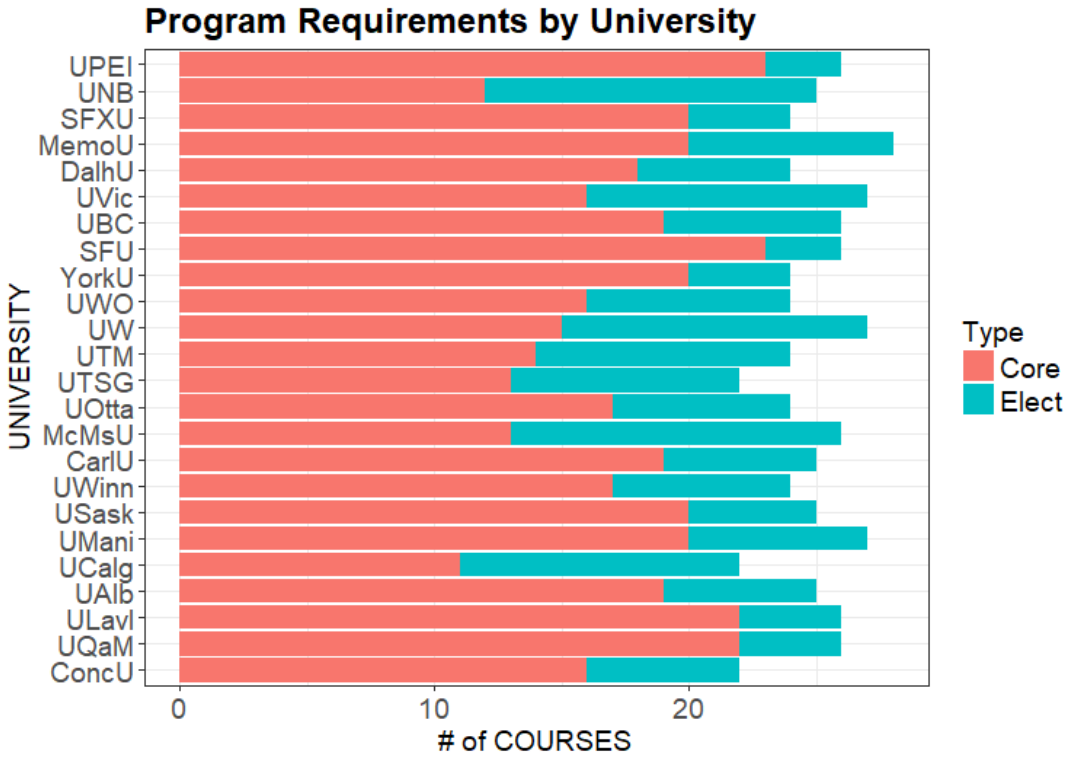






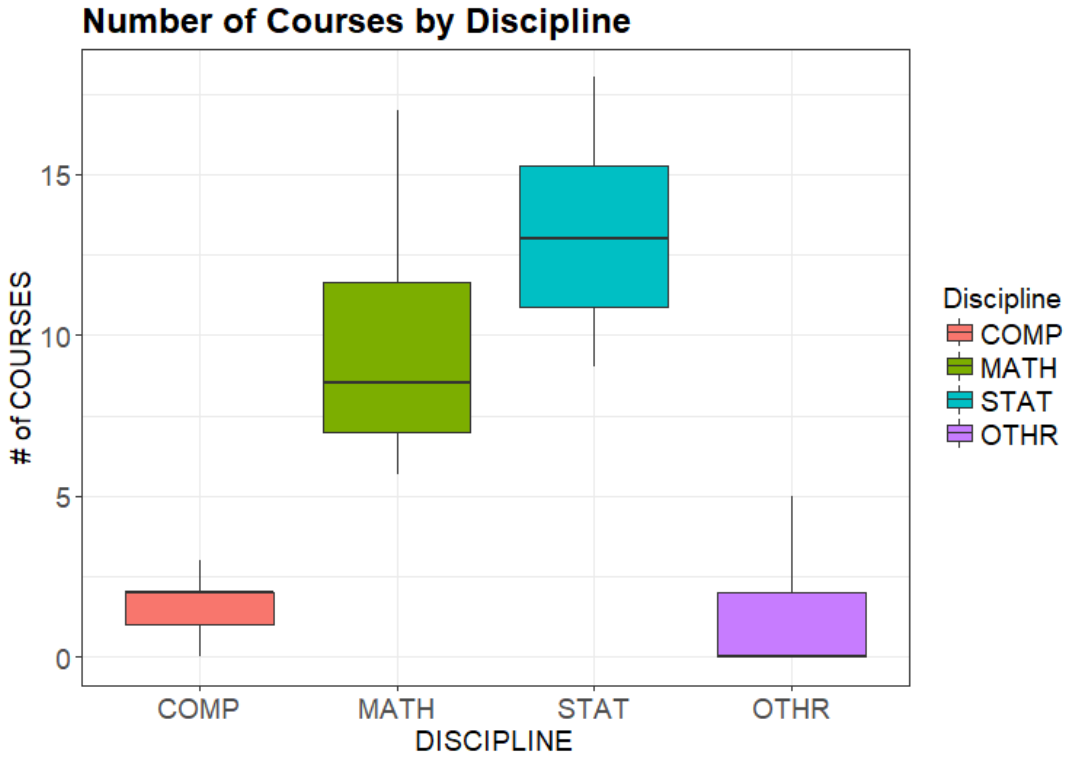
Number of Courses

- **25 semester courses** required on average; with most programs between 24-26
  - i.e. 12 - 13 full-year equivalents, or 72 - 78 credit hours
- **70% of courses specified** (core)
  - Most programs ranging between 60% - 80%

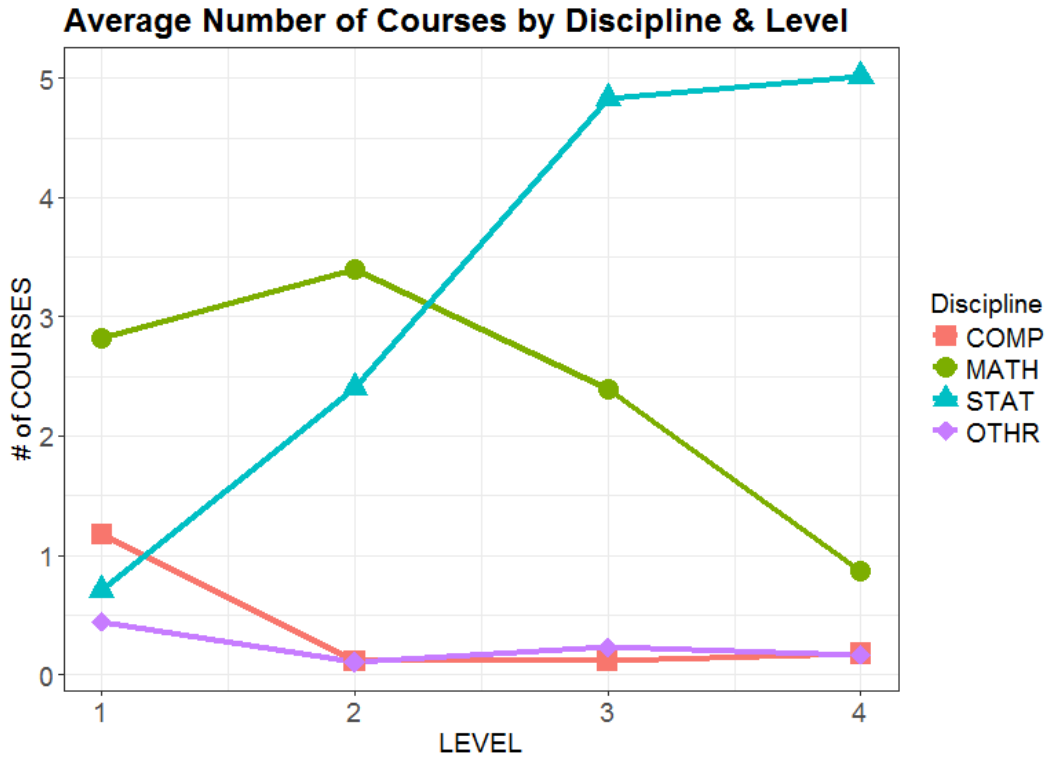


Breakdown of Courses by Discipline

52% STAT courses on average (and 38% MATH courses)

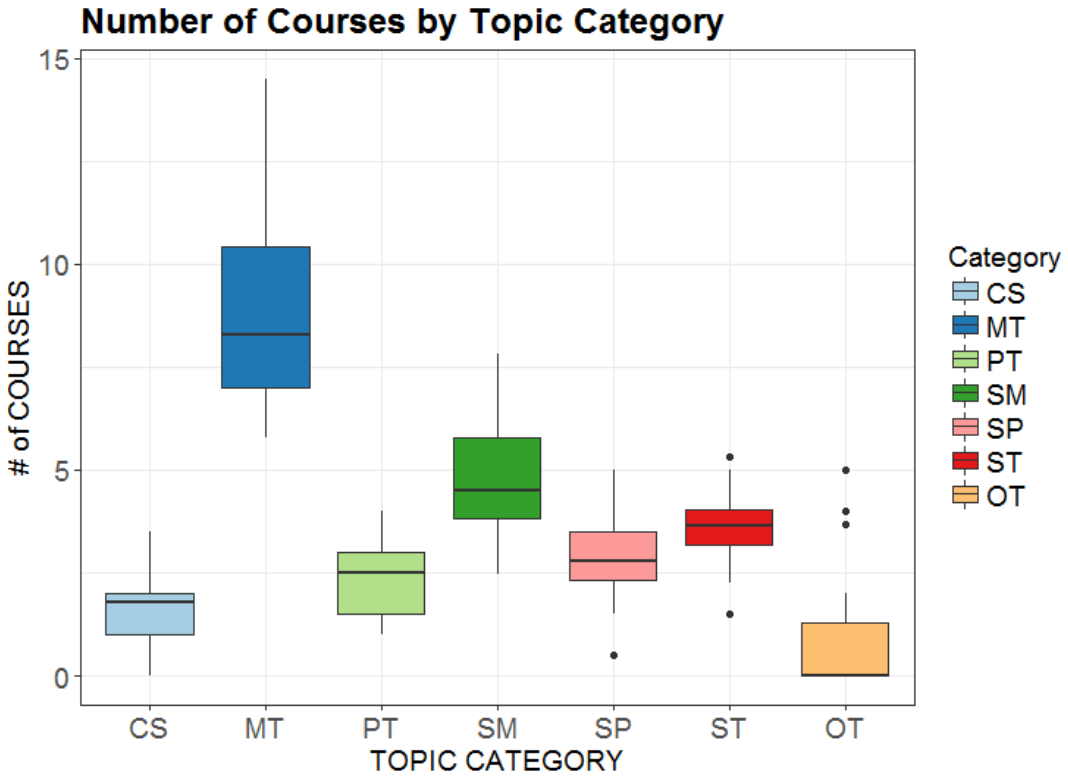


few STAT courses in 1st year (mostly none)

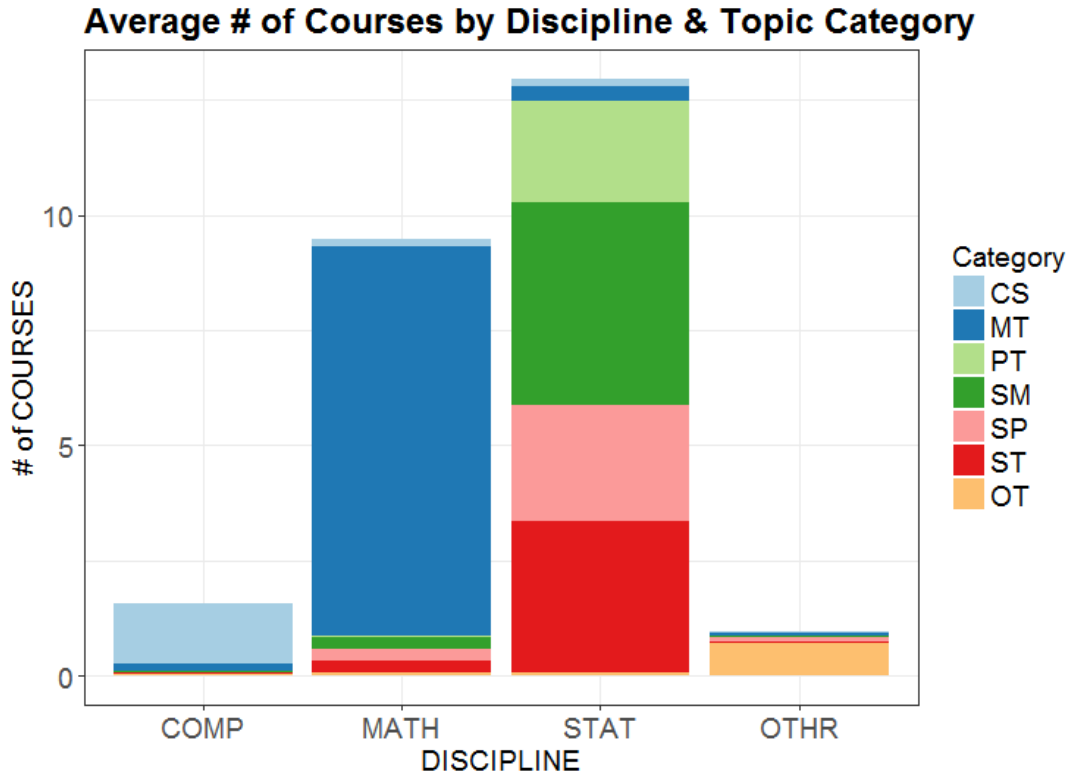


Breakdown of Courses by Topic Category

Practice is least developed Stats category



Math/Prob-heavy curriculum



Conclusions/Recommendations

- Train Stats Hons/Spec BSc's primarily for the workplace (rather than graduate study)
- Offer more Stats-specific courses (at expense of Math courses)
- Offer Stats courses early on (1st year)
- Place more focus on Statistical Practice