# DATA SCIENCE AT MACALESTER COLLEGE

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TPSE Meeting, Washington DC

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# Macalester student demographic

~2000 students living on or close to campus

~ 35% admission rate

~18% Pell grant recipients

~15% international (~75 different countries)

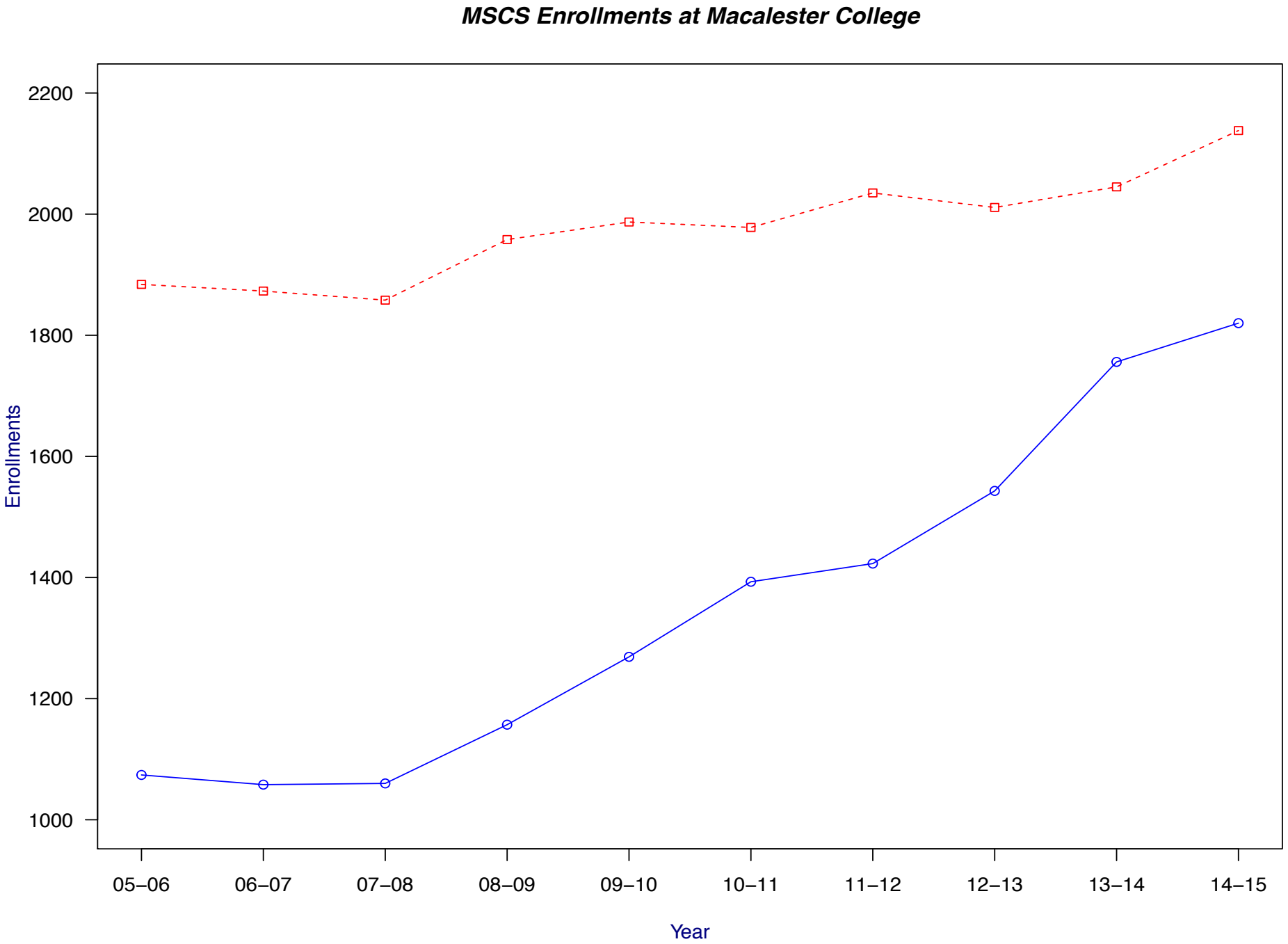
~ 20% students of color

~13% of FY class are first generation

~ 31 is ACT average for FY class

# Department of Mathematics, Statistics and Computer Science [MSCS]

- T/TT=7M+3S+3CS. Several visitors.
- This year ~85 graduating majors
- Largest partner disciplines: biology and economics


MSCS Enrollments at Macalester College
2200
2000
1800
1600
1400
1200
1000
Enrollments
05–06
06–07
07–08
08–09
09–10
10–11
11–12
12–13
13–14
14–15
Year

# MSCS Programs

**MAJORS**

- Mathematics
- Computer Science
- Applied Mathematics & Statistics

**MINORS**

- Mathematics
- Computer Science
- Statistics
- Data Science

# Macalester's Data Science Minor

**Requirements**

- 2 CS courses
- 2 statistics courses
- 2 "domain" courses
- Final "integrative essay"

# Sample “Domain Courses”

**Astronomy**

- PHYS 120: Astronomical Techniques
- PHYS 440: Observational Astronomy

**Bioinformatics**

- BIOL 260: Genetics
- COMP 302: Computational Biology

**Computational Linguistics**

- LING100: Intro to Linguistics
- LING 294: Computational Methods

**Computational Sociology**

- SOCI 269: Social Science Inquiry
- SOCI 190 Criminal Behavior/Social Control
- SOCI 283 Economic Sociology

**Data-Driven Journalism**

- MCST 114: News Reporting and Writing and one of
- MCST 355: Electronic Journalism
- MCST 357: New Media

**Ecology**

- BIOL 285: Ecology and one of
- BIOL 342: Animal Behavior/Ecology
- BIOL 344: Aquatic Ecology
- BIOL 345: Field Botany

**Environmental Science and Policy**

- ENVI 231: Environmental Econ and one of
- ENVI 130: Science of Renewable Energy
- ENVI 140: The Earths Climate System
- ENVI 150: Climate and Society
- ENVI 160: Dynamic Earth, Global Change

**Geographic Analytics**

- GEOG 225: GIS, & 1 GEOG 362: Remote Sensing; ETC

**Neuroscience**

- NEUR 244: Cognitive Neuroscience
- NEUR 385: Functional MRI

**Political Analytics**

- POLY 214: Cyber Politics
- POLY 269: Empirical Research Methods

**Quantitative Economics**

- ECON 358: Securities Analysis
- ECON 381: Econometrics
- ECON 420: Quantitative Macro Analysis
- ECON 485: Empirical Finance

**Quantitative Public Health**

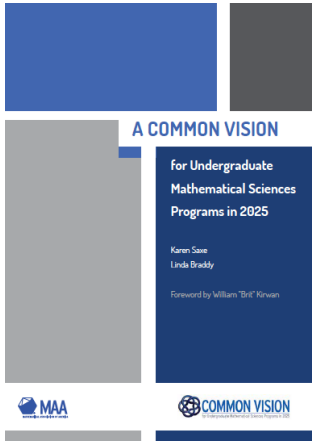
- BIOL 355: Virology
- BIOL 357: Immunology
- GEOG 256: Medical Geography
- MATH 125:Epidemiology

# A Common Vision for Undergraduate Mathematical Sciences Programs

TPSE & Common Vision both launched to

- address collective challenges and
- capitalize on opportunities

found in the NRC and PCAST reports.




*Analyzed AMATYC, AMS, ASA, MAA, SIAM curricula & pedagogy guides.*

"Calls to action"

- Update curriculum
- Articulate pathways between K-12 curriculum and first college courses
- Scale-up evidence based pedagogical methods
- Remove barriers facing students at critical transition points (e.g., placement, transfer)
- Establish stronger connections to other disciplines