**Math Plan Logic**

All students need 3 credits of AUCC core math, some majors name specific courses.  
Every major has exactly one of these sets of MATH requirements (Calculus in **bold**)

* Any AUCC
* 117 and 101
* 117, 118, 124
* 117, 118, 125
* 117, 118, 124, 125
* 3 credits from (117, 118, 124) or 120
* 3 credits from 117, 118, 125, **141**
* 3 credits from (117, 118, 124) or 120 or **155**
* 3 credits from (117, 118, 124) or 120 or 125, 126
* 3 credits from (117, 118, 124) or 120 or 125, 126, **141**
* 3 credits from (117, 118, 124) or 120 or 125, 126, **141**, **155**
* 3 credits from (117, 118, 124) or 120 or 125, 126, **141**, **155, 156, 160**
* 3 credits from 118, 124, 125, 126, **155**, **160**
* 117, 118, 124, **141**
* 118, 124, 125
* 118, 124, 125, **141**
* 124, 125, 126, **155**
* 126
* 117, 118, 124, 125, **141** or **155**
* **141**
* **141** or **155** or **160**
* **155**
* **155** or **160**
* **156**
* **156** or **160**
* **160**

Every major has an "ideal first-semester eligibility" from advisors - in general, this maps to what the catalog says, but catalog data is more specific.

**Placement Results Notes**

In "mpe\_credit":

* if course is "M 100C", that represents placing into MATH 117 on the Placement Tool or ELM Exam.
* if course is "M 100M", that represents completing the ELM Unit 3 proctored exam (this was used to place students into MATH 101 or 105 at one point - we no longer offer a proctored Unit 3 exam)
* if course is "M 100T", that represents completing the Unit 3 Review in the ELM tutorial - this has been recently used to allow access to MATH 116.

Once a collection of majors has been selected, we do these steps:

1. If all are "Any AUCC", our result is "Any AUCC" and we're done.
2. Determine the Calculus requirement
   1. Group requirements into {60, 56, 56/60, 55, 55/60, 41, 41/55, 41/55/60, 41/55/56/60}
   2. Scan all that specify a single Calculus requirement and mark those requirements as "named".
   3. Determine the "named calculus requirement" **NC** as follows
      1. If **60** is named, then **NC = 60**
      2. If **56** is named, then
         1. If **55** or **55/60** is named, then **NC = 60**
         2. Else **NC = 56**
      3. Else if **56/60** is named, then
         1. If **55** or **55/60** is named, then **NC = 60**
         2. Else **NC = 56/60**
      4. Else if **55** is named, then **NC = 55**
      5. Else if **55/60** is named, then **NC = 55/60**
      6. Else if **41** is named, then **NC = 41**
      7. Else if **41/55** is named, then **NC = 41/55**
      8. Else if **41/55/60** is named, then **NC = 41/55/60**
      9. Else **NC = NONE**
3. Determine the Precalculus requirement:
   1. Determine the "named precalculus requirement" **NP** as follows:
      1. If no majors require any precalculus, **NP = NONE**
      2. Else **NP = Union(named requirements)**
   2. Determine the "implicit precalculus requirement" **IP** as follows:
      1. Populate **IP** with all prerequisites for **NC**.
      2. For every named course in **NP**, add its prerequisites to **IP**.
      3. Remove from **IP** all courses already in **NP**.
      4. Set a flag if **NC** requires the student to have a B- or higher in MATH 124 and MATH 126.
   3. Determine "pick lists" **PICKS** as follows:
      1. Scan all majors with "pick lists".
      2. If the combination of **NC** and **NP** will fulfill a pick list, ignore that pick list.
      3. For all not ignored, delete from the pick list all courses in **NC** and **NP** and reduce credit counts.
      4. **PICKS** = the set of all reduced pick lists for testing later (there is no good way to condense these)
4. Calculate a "recommended trajectory" through Math for the student as follows
   1. If **NC** is not **NONE**, that calculus option is the end of their trajectory
   2. Add all **NP** and **IP** courses to the trajectory.
   3. For all pick lists, add courses to the trajectory as needed until the pick list is satisfied. We should never need to add more than Precalculus courses to satisfy any pick list.
   4. If 117 + 118 + 124 are in the trajectory, but none of these are in **NP**, add MATH 120 as an option to the trajectory.
   5. Examine transfer credit, CSU course credit, and placement credit. Categorize trajectory courses as:
      1. Completed with sufficient grade
      2. Completed, but with a C or lower and student needs a B- or higher
      3. The student is eligible for the course
      4. The student is not yet eligible for the course
   6. Create "next steps" for the student:
      1. If the student needs only code courses, indicate "Placement is not needed".
      2. Else if the student is eligible for their Calculus course, indicate "You are eligible for \_\_\_, no further action is needed."
      3. Else if the student is eligible for all named precalculus courses (possibly having to register for multiple in a term), indicate "You are eligible for \_\_\_, no further action is needed."
      4. Else indicate "You should complete the \_\_\_ sections of Math Placement to try to place out of [implicit requirements] to become eligible for [named requirements]."

**Math Plan Database Storage**

All student responses are stored in the "stmathplan" table. Responses on the same login session are tracked by an ID in the "session" field.

To get the most recent responses, query for the maximum "exam\_dt" and "finish\_time" combination for a particular question,

then get all responses with those values.

**version: survey\_nbr: description:**

WLCM1 (varies) One "Y" response per selected major, survey\_nbr is the numeric code of the major.

WLCM2 1, 2, 3, 4 A short summary of the plan for PRE, Sem1, Sem2, and beyond  
 Starting in SM25, this is reduced to just PRE

WLCM3 1 "Y" if the student checked the "this is only a recommendation" assertion

WLCM4 1 "Y" is the student reviewed their existing work

WLCM5 1 "Y" means the math plan is completed and placement is **not needed**

2 "Y" means the math plan is completed and placement is **needed**

WLCM6 1 "Y" means the student has accessed placement review materials

WLCM7 1 "Y" means the student has checked results after completing placement

**Math Plan Outcomes**

Status is stored in SOATEST as a test score with exam code "MPL".

The test score is "1" is placement is either complete or is not needed (this displays a completion checkbox on the Ram Start item for Math Placement), or "2" if placement is needed and not yet complete (this marks that Ram Start item as something needing to be done.

Since data can arrive after the student completes their plan (transfer credit, for example), there is a nightly batch that recalculates this test score for all new students, checks the value in SOATEST, and performs an update if status has changed.

We don't have a way to update the MPL test score in place, so when we need to change it, we have to insert a new MPL test score row with the updated value - systems that use the MPL score have to query for the most recent score.

**Catalog Data** (from 2025-2026 Catalog as of July 15, 2025)

College of Agricultural Sciences

Agricultural and Resource Economics

Major in Agricultural Business

Named: **117**, **118**, **124** (some need **141**)

Ideal: Eligible for **117**

Major in Agricultural Education

Named: 3 credits from **117**, **118**, **124** or **120**.

Ideal: Eligible for **117**

Major in Environmental and Natural Resource Economics

Named: **117**, **118**, **124**, **141**

Ideal: Eligible for **117**

Major in Livestock Business Management

Named: **117**, **118**, **124**

Ideal: Eligible for **117**

Agricultural Biology

Major in Agricultural Biology

Named: 3 credits from **117**, **118**, **124,** **120** or **155**.

Ideal: Eligible for **117**

Animal Sciences

Major in Animal Science

Named: 3 credits from **117**, **118**, **124,** **120, 125, 126, 141,** or **155**.

Ideal: Eligible for **117**

Major in Equine Science

Named: 3 credits from **117**, **118**, **124,** **120, 125, 126, 141,** or **155**.

Ideal: Eligible for **117**

Horticulture and Landscape Architecture

Major in Environmental Horticulture (General)

Named: **117**, **118**, **124**

Ideal: Eligible for **117**

Major in Environmental Horticulture (Landscape Design and Contracting)

Named: **117**, **118**, **125**

Ideal: Eligible for **117**

Major in Horticulture (General)

Named: **117**, **118**, **124**

Ideal: Eligible for **117**

Major in Horticulture (Horticultural Science)

Named: **124**, **125**, **126, 155**

Ideal: Eligible for **124** and **125**

Major in Landscape Architecture

Named: **126**

Ideal: Eligible for **118**

Soil and Crop Sciences

Major in Soil and Crop Sciences

Named: **117**, **118**, **124**

Ideal: Eligible for **117**

College of Business

(All departments)

Major in Business Administration

Named: 3 credits from **117**, **118**, **124,** **120, 125, 126,** **141, 155, 156, 160**.

Ideal: Eligible for **117**

Walter Scott Jr. College of Engineering

Civil and Environmental Engineering

Major in Civil Engineering

Named: **160**

Ideal: Eligible for **160**

Major in Construction Engineering

Named: **160**

Ideal: Eligible for **160**

Major in Environmental Engineering

Named: **160**

Ideal: Eligible for **160**

Electrical and Computer Engineering

Major in Computer Engineering

Named: **160**

Ideal: Eligible for **160**

Major in Electrical Engineering

Named: **160**

Ideal: Eligible for **160**

Mechanical Engineering

Major in Mechanical Engineering

Named: **160**

Ideal: Eligible for **160**

School of Biomedical and Chemical Engineering

Major in Chemical and Biological Engineering

Named: **160**

Ideal: Eligible for **160**

College of Health and Human Sciences

Construction Management

Major in Construction Management

Named: **117**, **118**, **125**

Ideal: Eligible for **117**

Design and Merchandising

Major in Apparel and Merchandising

Named: **117**, **118**, **124**

Ideal: Eligible for **117**

Major in Interior Architecture and Design

Named: **117**, **118**, **124**

Ideal: Eligible for **117**

Food Science and Human Nutrition

Major in Fermentation and Food Science

Named: **117**, **118**, **124** (plus **125** and **141** or **155** for Food Science Concentration)

Ideal: Eligible for **117**

Major in Hospitality and Event Management

Named: **117**, **101**

Ideal: Eligible for **117**

Major in Nutrition Science

Named: **117**, **118**, **124** (plus **125** for Pre-Health Nutrition Concentration)

Ideal: Eligible for **117**

Health and Exercise Science

Major in Health and Exercise Science

Named: **118**, **124**, **125**

Ideal: Eligible for **118**

Human Development and Family Studies

Major in Early Childhood Education

Named: 3 credits AUCC

Major in Family and Consumer Sciences Education

Named: 3 credits AUCC

Major in Human Development and Family Studies

Named: 3 credits AUCC

Social Work

Major in Social Work

Named: 3 credits AUCC

College of Liberal Arts

Anthropology and Geography

Major in Anthropology

Named: 3 credits AUCC

Major in Geography

Named: 3 credits AUCC

Art and Art History

Major in Art (B.F.A or B.A.)

Named: 3 credits AUCC

Communication Studies

Major in Communication Studies

Named: 3 credits AUCC

Economics

Major in Economics

Named: **141** or **155** or **160**

Ideal: Eligible for **141**

English

Major in English

Named: 3 credits AUCC

History

Major in History

Named: 3 credits AUCC

Journalism and Media Communication

Major in Journalism and Media Communication

Named: 3 credits AUCC

Languages, Literatures and Cultures

Major in Languages, Literatures and Cultures

Named: 3 credits AUCC

Philosophy

Major in Philosophy

Named: 3 credits AUCC

Political Science

Major in Political Science

Named: 3 credits AUCC

Race, Gender, and Ethnic Studies

Major in Ethnic Studies

Named: 3 credits AUCC

School of Music, Theatre, and Dance

Major in Dance

Named: 3 credits AUCC

Major in Music

Named: 3 credits AUCC

Major in Theatre

Named: 3 credits AUCC

Sociology

Major in Sociology

Named: 3 credits AUCC

Warner College of Natural Resources

Ecosystem Science and Sustainability

Major in Ecosystem Science and Sustainability

Named: **155** or **160**

Ideal: Eligible for **155**

Major in Watershed Science and Sustainability

Named: **155** or **160** (or **141** for Watershed Sustainability Concentration)

Ideal: Eligible for **155**

Fish, Wildlife, and Conservation Biology

Major in Fish, Wildlife, and Conservation Biology

Named: **155** or **160**

Ideal: Eligible for **155**

Forest and Rangeland Stewardship

Major in Forest and Rangeland Stewardship (General)

Named: **141**

Ideal: Eligible for **141**

Major in Forest and Rangeland Stewardship (Forest Biology Concentration)

Named: **155**

Ideal: Eligible for **155**

Major in Forest and Rangeland Stewardship (Rangeland Conservation and Management Concentration)

Named: 3 credits from **117, 118, 125, 141**

Ideal: Eligible for **117**

Major in Restoration Ecology

Named: 3 credits from **117, 118, 125, 141**

Ideal: Eligible for **117**

Geosciences

Major in Geology

Named: **160**

Ideal: Eligible for **160**

Human Dimensions of Natural Resources

Major in Human Dimensions of Natural Resources

Named: **117, 118, 124**

Ideal: Eligible for **117**

Major in Natural Resource Tourism

Named: **117, 118, 124**

Ideal: Eligible for **117**

College of Natural Sciences

Biochemistry and Molecular Biology

Major in Biochemistry

Named: **155** or **160**

Ideal: Eligible for **155**

Biology

Major in Biological Science

Named: **155** or **160**

Ideal: Eligible for **155**

Major in Zoology

Named: **155** or **160**

Ideal: Eligible for **155**

Chemistry

Major in Chemistry

Named: **155** or **160**

Ideal: Eligible for **155**

Computer Science

Major in Computer Science

Named: **156** or **160**

Ideal: Eligible for **156** or **160**

Mathematics

Major in Mathematics

Named: **160**

Ideal: Eligible for **160**

Natural Sciences

Major in Data Science

Named: **156**

Ideal: Eligible for **156**

Major in Natural Science

Named: **155** or **160**

Ideal: Eligible for **155**

Major in Natural Science (Physics Education)

Named: **160**

Ideal: Eligible for **160**

Physics

Major in Physics

Named: **160**

Ideal: Eligible for **160**

Psychology

Major in Psychology (General)

Named: **117, 118, 124**

Ideal: Eligible for **117**

Major in Psychology (Mind, Brain, and Behavior Concentration)

Named: 3 credits from **117, 118, 124, 120, 125, 126**

Ideal: Eligible for **117**

Statistics

Major in Statistics

Named: **156** or **160**

Ideal: Eligible for **156** or **160**

College of Veterinary Medicine and Biomedical Sciences

Biomedical Sciences

Major in Biomedical Sciences (General)

Named: 3 credits from **118, 124, 125, 126, 155, 160**

Ideal: Eligible for **118**

Major in Biomedical Sciences (Anatomy and Physiology)

Named: **155** or **160**

Ideal: Eligible for **155**

Major in Neuroscience

Named: **155**

Ideal: Eligible for **155**

Environmental and Radiological Health Sciences

Major in Health Physics

Named: **160**

Ideal: Eligible for **160**