

# BIOLOGY - ASSOCIATE OF SCIENCE TRANSFER (AST)

## Description

The Associate of Science Transfer degree in Biology is designed for students who plan to transfer to a four-year university to complete a Bachelor's of Science (B.S.) degree with a major in Biology. The degree meets lower-division general education requirements for transfer to an Oregon public institution, and students who successfully complete the courses and program GPA requirements will transfer in with junior standing in the major. Admission to an Oregon public institution is not guaranteed. The AST in Biology may be the best degree option for students who know they want to pursue a B.S. in Biology, Zoology, Marine Biology, Microbiology, or Plant Science leading potentially to post-baccalaureate graduate-level programs in research, human or veterinary medicine, or dentistry.

This program is part of a statewide Major Transfer Map (MTM) agreement that identifies the community college courses needed to transfer to any Oregon public university as a junior seeking a Bachelor of Science in Biology.

## Program learning outcomes

Upon successful completion of the program, students will be able to:

1. Use scientific processes to gather data and draw evidence-based conclusions.
2. Solve problems using scientific information.
3. Communicate scientific information in written and graphical formats.
4. Examine the influence of scientific knowledge on human society and the environment.

## ACADEMIC ENTRANCE REQUIREMENTS

While this program has no formal entrance requirements, individual courses may have prerequisites which must be met before enrollment.

## Course REQUIREMENTS

Course	Title	Credits
<b>Core Transfer Requirements</b>		
<b>Mathematics:</b>		
MTH 111Z	Precalculus I: Functions <sup>1</sup>	4
<b>Writing:</b>		
WR 121Z	Composition I	4
<b>Cultural Literacy:</b>		
One course from the following categories must be designated as cultural literacy on the Discipline Studies list (credits count once).		
<b>Arts and Letters:</b>		
Choose two courses		6-8
<b>Social Science:</b>		
Choose two courses		6-8
<b>Natural Sciences:</b> <sup>2</sup>		
BI 221	Principles of Biology: Cells	5
BI 222	Principles of Biology: Organisms	5
<b>Additional Major Transfer Map Courses</b>		
BI 223	Principles of Biology: Populations <sup>2</sup>	5

CH 221 & CH 222 & CH 223	General Chemistry I and General Chemistry II and General Chemistry III	15
MTH 112Z	Precalculus II: Trigonometry <sup>3</sup>	4
Physics/Math/Chemistry (pick two sequences): <sup>4,5</sup>		23-30
<b>Sequence 1</b>		
PH 201 & PH 202 & PH 203	General Physics I and General Physics II and General Physics III	
or PH 211 & PH 212 & PH 213	General Physics I and General Physics II and General Physics III	
<b>Sequence 2</b>		
MTH 251 & MTH 252	Calculus I and Calculus II	
<b>Sequence 3</b>		
CH 241 & CH 242 & CH 243	Organic Chemistry I and Organic Chemistry II and Organic Chemistry III	
WR 122Z or WR 227Z	Composition II <sup>6</sup> Technical Writing	4
<b>Electives:</b>		<b>9</b>
Choose any course numbered 100 or above that brings the total credits to 90 quarter hours. <sup>7</sup>		
This may include up to 12 credits of career and technical education (CTE) courses designated by COCC as acceptable.		
<b>Total Credits</b>		<b>90-101</b>

- <sup>1</sup> Students who test out of MTH 111Z Precalculus I: Functions should take MTH 112Z Precalculus II: Trigonometry.
- <sup>2</sup> Biology series must be taken at the same institution.
- <sup>3</sup> Students who test out of MTH 112Z Precalculus II: Trigonometry may substitute a recommended elective.
- <sup>4</sup> **EOU:** Required to take MTH 241 Calculus for Management/Social Science instead of MTH 251 Calculus I and MTH 252 Calculus II. MTH 251 Calculus I may serve as a substitute for MTH 241 Calculus for Management/Social Science.  
**OSU:** are strongly recommended to take the Organic Chemistry sequence.  
**PSU:** May substitute STAT 243Z Elementary Statistics I and MTH 244 Introduction to Probability and Statistics 2 for MTH 251 Calculus I and MTH 252 Calculus II.
- <sup>5</sup> Students considering pre-medical, pre-dental, and pre-pharmacy programs should consider Organic Chemistry sequence. Courses in sequence must be taken at the same institution.
- <sup>6</sup> **OSU:** accepts either but recommends WR 227Z Technical Writing.  
**WOU/ UO:** accepts either, but recommends WR 122Z Composition II.
- <sup>7</sup> Recommended electives include:  
**EOU/ SOU/ PSU:** STAT 243Z Elementary Statistics I. Pick a third sequence from physics, math or chemistry.  
**OIT:** 4-6 credits social science. 1-3 credits humanities. 2 credits lower division health biology.  
**OSU:** COMM 111Z Public Speaking. 3 credits fitness. Pick a third sequence from physics, math or chemistry series.

**UO/ WOU:** WR 122Z Composition II. Pick a third sequence from physics, math or chemistry.

## PERFORMANCE STANDARDS

- Academic Requirements:
  - Students must have a 2.0 cumulative GPA to earn a COCC certificate or degree.
  - All courses in the program must be completed with a grade of C or higher.

## Advising notes

- Oregon public universities with majors in Biology include: Eastern Oregon University (EOU), Oregon Institute of Technology (OIT), Oregon State University (OSU), Portland State University (PSU), Southern Oregon University (SOU), University of Oregon (UO), Western Oregon University (WOU).
- Students planning to attend SOU, PSU, or WOU may take statistics STAT 243Z instead of Calculus, consult your advisor for best math option for your path.
- Check with advisor and transfer institution prior to choosing either Organic Chemistry ( CH 241, CH 242, CH 243 or Physics (PH 201, PH 202, PH 203 or PH 211, PH 212, PH 213)
- If intending to transfer to OSU choose WR 227Z Technical Writing in Foundational Requirements

## SAMPLE PLAN

### First Year

First Term		Credits
MTH 111Z	Precalculus I: Functions <sup>1</sup>	4
<b>Credits</b>		<b>4</b>

### Second Term

CH 221	General Chemistry I	5
Elective: <sup>7</sup>		3
MTH 112Z	Precalculus II: Trigonometry <sup>3</sup>	4
WR 121Z	Composition I	4
<b>Credits</b>		<b>16</b>

### Third Term

CH 222	General Chemistry II	5
Elective: <sup>7</sup>		3
Physics/Math/Chemistry (consider MTH 251) <sup>4</sup>		4
WR 122Z or WR 227Z	Composition II <sup>6</sup> or Technical Writing	4
<b>Credits</b>		<b>16</b>

### Fourth Term

CH 223	General Chemistry III	5
Elective: <sup>7</sup>		3
Physics/Math/Chemistry (consider MTH 252) <sup>4</sup>		4
<u>Social Science:</u>		3-4
<b>Credits</b>		<b>15-16</b>

### Second Year

#### First Term

<u>Arts and Letters:</u>		3-4
BI 221	Principles of Biology: Cells <sup>2</sup>	5

Physics/Math/Chemistry (consider CH 241 or PH 201) <sup>5</sup>		5
<b>Credits</b>		<b>13-14</b>

#### Second Term

<u>Arts and Letters:</u>		3-4
BI 222	Principles of Biology: Organisms <sup>2</sup>	5
Physics/Math/Chemistry (consider CH 242 or PH 202 or PH 211) <sup>5</sup>		5
<b>Credits</b>		<b>13-14</b>

#### Third Term

BI 223	Principles of Biology: Populations <sup>2</sup>	5
Physics/Math/Chemistry (consider CH 243 or PH 203 or PH 212) <sup>5</sup>		5

<u>Social Science:</u>		3-4
<b>Credits</b>		<b>13-14</b>

#### Fourth Term

Physics/Math/Chemistry (consider PH 213) <sup>8</sup>		5
<b>Credits</b>		<b>5</b>
<b>Total Credits</b>		<b>95-99</b>

<sup>1</sup> Students who did not complete Precalculus I in high school should take MTH 111Z Precalculus I: Functions summer term prior to starting the General Chemistry sequence. Students who test out of MTH 111Z Precalculus I: Functions can wait to take MTH 112Z Precalculus II: Trigonometry in their first full term at COCC and may substitute a recommended elective during their program, refer to footnote 7.

<sup>2</sup> Biology series must be taken at the same institution.

<sup>3</sup> Students who test out of MTH 112Z Precalculus II: Trigonometry may substitute a recommended elective, refer to footnote 5.

<sup>4</sup> **EOU:** Required to take MTH 241 Calculus for Management/Social Science instead of MTH 251 Calculus I and MTH 252 Calculus II. MTH 251 Calculus I may serve as a substitute for MTH 241 Calculus for Management/Social Science.

**OSU:** are strongly recommended to take the Organic Chemistry sequence.

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<sup>5</sup> Students considering pre-medical, pre-dental, and pre-pharmacy programs should consider Organic Chemistry sequence. Courses in sequence must be taken at the same institution.

**OSU:** accepts either but recommends WR 227Z Technical Writing.

**WOU/ UO:** accepts either, but recommends WR 122Z Composition II.

<sup>7</sup> Recommended electives include:

**EOU/ SOU/ PSU:** STAT 243Z Elementary Statistics I. Pick a third sequence from physics, math or chemistry.

**OIT:** 4-6 credits social science. 1-3 credits humanities. 2 credits lower division health biology.

**OSU:** COMM 111Z Public Speaking. 3 credits fitness. Pick a third sequence from physics, math or chemistry series.

**UO/ WOU:** WR 122Z Composition II. Pick a third sequence from physics, math or chemistry.

<sup>8</sup> Third year PH 213 only required if students choose calculus based physics starting in term 2 of year two.