

## Mathematics – General Emphasis

### Associate in Science

Minimum of 61 credit hours

Students who study mathematics have opportunities in many career fields. This is because mathematics plays such a central role in areas such as the physical and social sciences, engineering, computer science and business. At Oklahoma City Community College, mathematics students concentrate on the calculus sequence and appropriate science courses, but have the option to take foundational mathematics classes such as Pre-Calculus and Trigonometry and/or to extend the mathematics classes with options that support their degree and career plans. Mathematicians should have a high degree of reasoning ability and logic and be able to present facts and ideas clearly. When completing the Mathematics Program, students earn associate degrees and become prepared to continue their education at a four-year college or university. Career opportunities may be found in science, education, engineering, research, finance, economics, computers, government and construction.

## COURSE SEQUENCE

Course ID	Course Name	Credits	Type	Min GD
<b>Term 1</b>				
SCL 1001	Success in College and Life Students will learn best practices for academic, career, and personal success. Students will discover their individual strengths, interests, and values to create a personalized plan; select and utilize resources that are applicable to their growth and success; and engage as active and responsible members of the academic community. This course should be taken during a student's first semester of college work at Oklahoma City Community College and is a required course in degree plans to satisfy the Life Skills requirement. <b>Prerequisites:</b> ENGL 0106 or adequate reading/writing assessment scores	1	Life Skills	
SUPP	Guided Support Elective Guided Support elective	3	Support	
ENGL 1113	English Composition I The student will write well-developed compositions which demonstrate the principles of unity, coherence, and organization and which contain specific details and vivid language. The students will locate library material and incorporate researched materials into compositions. <b>Prerequisites:</b> ENGL 0203, adequate placement score, or by meeting determined placement measures	3	Gen Ed	
<b>Term 2</b>				
ENGL 1213	English Composition II In this advanced writing course, students will create essays that explore and evaluate a variety of issues and perspectives suggested by fiction, poetry, drama, essays, and other types of cultural texts. Students will refine and augment the writing techniques they learned in ENGL 1113 or ENGL 1103 to develop well- reasoned, well-structured arguments in a clear, fluid, and engaging prose style. <b>Prerequisites:</b> ENGL 1103 or ENGL 1113 taken within the last year, with strong encouragement for immediate continuation.	3	Gen Ed	
SUPP	Guided Support Elective Guided Support elective	3	Support	
<b>Term 3</b>				
BIO	Biological Science Biological Science	3-4	Gen Ed	
HIST 1483	U.S. History to 1877	OR	Gen Ed	

After analyzing events in American history from 1400 to 1877 in such areas as revolution, geographic and social mobility, political reform, government precedents and war, students will be able to identify patterns of present day mobility, describe governmental operations in their society and help resolve conflict in society based on the student's search for change, precedents, and conflict in the American past. A general education requirement. **Prerequisites:**

ENGL 0203, adequate placement score, or by meeting determined placement measures

HIST 1493 U.S. History 1877 to Present 3 Gen Ed

After analyzing events in American history from 1877 to the present in such areas as geographic and social mobility, political reform, government precedents and war, students will be able to identify patterns of present day mobility, describe governmental operations in their society and help resolve conflict in society based on the student's search for change, precedents, and conflict in the American past. A general education requirement. **Prerequisites:**

ENGL 0203, adequate placement score, or by meeting determined placement measures

#### Term 4

HUM Humanities Elective 3 Gen Ed  
Humanities elective

MATH 2104 Calculus and Analytic Geometry I 4 Gen Ed C  
The student will compute, interpret, and apply the basic concepts of limits, differentiation, and integration to algebraic and transcendental functions and will solve applied problems that include rates of change, optimization, area, and total change in a function. **Prerequisites:**  
MATH 1533 and MATH 1613 or adequate math placement.

#### Term 5

GEN ED Gen Ed Elective 3 Gen Ed  
General Education elective

POLSC 1113 American Federal Government 3 Gen Ed  
A study of the principles, structure, processes and functions of the United States federal government. **Prerequisites:**  
ENGL 0203, adequate placement score, or by meeting determined placement measures

#### Term 6

HUM Humanities Elective 3 Gen Ed  
Humanities elective

MATH 2214 Calculus and Analytic Geometry II 4 Major C  
The student will use integration techniques to find antiderivatives, use integrals to solve problems from geometry and physics, use vectors to solve problems in higher dimensions, test infinite series for convergence, approximate functions by using series, solve elementary first-order differential equations, and analyze functions of three variables and their contour plots. **Prerequisites:**  
MATH 2104 within the last year.

#### Term 7

PHYS 2014 Engineering Physics I 4 Gen Ed

This is a physics course designed primarily for pre-engineering, chemistry and physics majors. Students will demonstrate their understanding of concepts in mechanics, heat and sound by (1) developing qualitative and quantitative descriptions of physical phenomena, and (2) predicting the results of physical occurrences based on physics theory and laboratory experiments. Quantitative descriptions and predictions will incorporate methods of calculus where appropriate. **Prerequisites:**  
MATH 2104 (or at least 4 hours of calculus) within the last year or by evaluation. Prerequisite or Corequisite:  
MATH 2214

GEN ED Gen Ed Elective 3 Gen Ed  
General Education elective

#### Term 8

MATH 2314 Calculus and Analytic Geometry III 4 Major C

The student will compute partial derivatives, gradients, differentials, double and triple integrals in rectangular, cylindrical and spherical coordinate systems, curl and divergence of a vector field, and path and surface integrals of vector fields directly and by applying Green's Theorem, Stokes' Theorem and the Divergence Theorem; write parameterizations for lines, curves and surfaces; and solve application problems that include optimization, work and flows of vector fields. **Prerequisites:**  
MATH 2214 within the last year.

GEN ED Gen Ed Elective 3 Gen Ed  
General Education elective

#### Term 9

SUPP	Guided Support Elective Guided Support elective	5	Support
GEN ED	Gen Ed Elective General Education elective	3	Gen Ed

## COURSE GROUPING

Major Courses: (8 credit hours) Mathematics: (C) MATH 2214; (C) MATH 2314

General Education Courses: (41 credit hours) Mathematics: (C) MATH 2104; English: ENGL 1113; ENGL 1213; History: HIST 1483 or HIST 1493; Political Science: POLSC 1113; Sciences: PHYS 2014, and any general education BIO course; Humanities: Six credit hours (PHIL 1603 recommended); Electives: General Education Electives 12 credit hours.

Life Skills Courses: (1 credit hour) Life Skills: SCL 1001

Support Courses: (11 credit hours) Selected from the following approved support courses with at least one course at the 2000 level: MATH 1503; MATH 1533; MATH 1613; MATH 2000; MATH 2013; MATH 2023; MATH 2213; MATH 2413; CS 1143; CS 2123; CS 2163; CS 2363; any 2000 level BIO; CHEM 1115; CHEM 1215; any 2000 level CHEM; ECON 2113; ECON 2123; any ENGR; GEOL 1114; PHYS 1504 or PHYS 1514 (but not both); any 2000 level PHYS.

## PROGRAM NOTES

Notes: This program is designed for students planning to continue their education at a four-year college or university. See the front general section for information and requirements about University Parallel/Transfer Programs.

## COURSE DESCRIPTIONS

### BIOLOGICAL SCIENCE

#### **BIO - Biological Science**

Biological Science

**Credits: 3**

### ELECTIVES

#### **GEN ED - Gen Ed Elective**

General Education elective

**Credits: 3**

#### **HUM - Humanities Elective**

Humanities elective

**Credits: 3**

#### **SUPP - Guided Support Elective**

Guided Support elective

**Credits: 3**

---

## ENGLISH

### ENGL 1113 - English Composition I

The student will write well-developed compositions which demonstrate the principles of unity, coherence, and organization and which contain specific details and vivid language. The students will locate library material and incorporate researched materials into compositions.

**Prerequisites:** ENGL 0203, adequate placement score, or by meeting determined placement measures

**Credits:** 3

### ENGL 1213 - English Composition II

In this advanced writing course, students will create essays that explore and evaluate a variety of issues and perspectives suggested by fiction, poetry, drama, essays, and other types of cultural texts. Students will refine and augment the writing techniques they learned in ENGL 1113 or ENGL 1103 to develop well-reasoned, well-structured arguments in a clear, fluid, and engaging prose style.

**Prerequisites:** ENGL 1103 or ENGL 1113 taken within the last year, with strong encouragement for immediate continuation.

**Credits:** 3

## HISTORY

### HIST 1483 - U.S. History to 1877

After analyzing events in American history from 1400 to 1877 in such areas as revolution, geographic and social mobility, political reform, government precedents and war, students will be able to identify patterns of present day mobility, describe governmental operations in their society and help resolve conflict in society based on the student's search for change, precedents, and conflict in the American past. A general education requirement.

**Prerequisites:** ENGL 0203, adequate placement score, or by meeting determined placement measures

**Credits:** 3

### HIST 1493 - U.S. History 1877 to Present

After analyzing events in American history from 1877 to the present in such areas as geographic and social mobility, political reform, government precedents and war, students will be able to identify patterns of present day mobility, describe governmental operations in their society and help resolve conflict in society based on the student's search for change, precedents, and conflict in the American past. A general education requirement.

**Prerequisites:** ENGL 0203, adequate placement score, or by meeting determined placement measures

**Credits:** 3

## MATHEMATICS

### MATH 2104 - Calculus and Analytic Geometry I

The student will compute, interpret, and apply the basic concepts of limits, differentiation, and integration to algebraic and transcendental functions and will solve applied problems that include rates of change, optimization, area, and total change in a function.

**Prerequisites:** MATH 1533 and MATH 1613 or adequate math placement.

**Credits:** 4

### MATH 2214 - Calculus and Analytic Geometry II

The student will use integration techniques to find antiderivatives, use integrals to solve problems from geometry and physics, use vectors to solve problems in higher dimensions, test infinite series for convergence, approximate functions by using series, solve elementary first-order differential equations, and analyze functions of three variables and their contour plots.

**Prerequisites:** MATH 2104 within the last year.

**Credits:** 4

### MATH 2314 - Calculus and Analytic Geometry III

The student will compute partial derivatives, gradients, differentials, double and triple integrals in rectangular, cylindrical and spherical coordinate systems, curl and divergence of a vector field, and path and surface integrals of vector fields directly and by

---

applying Green's Theorem, Stokes' Theorem and the Divergence Theorem; write parameterizations for lines, curves and surfaces; and solve application problems that include optimization, work and flows of vector fields.

**Prerequisites:** MATH 2214 within the last year.

**Credits:** 4

## PHYSICS

### PHYS 2014 - Engineering Physics I

This is a physics course designed primarily for pre-engineering, chemistry and physics majors. Students will demonstrate their understanding of concepts in mechanics, heat and sound by (1) developing qualitative and quantitative descriptions of physical phenomena, and (2) predicting the results of physical occurrences based on physics theory and laboratory experiments. Quantitative descriptions and predictions will incorporate methods of calculus where appropriate.

**Prerequisites:** MATH 2104 (or at least 4 hours of calculus) within the last year or by evaluation. Prerequisite or Corequisite: MATH 2214

**Credits:** 4

## POLITICAL SCIENCE

### POLSC 1113 - American Federal Government

A study of the principles, structure, processes and functions of the United States federal government.

**Prerequisites:** ENGL 0203, adequate placement score, or by meeting determined placement measures

**Credits:** 3

## SUCCESS IN COLLEGE AND LIFE

### SCL 1001 - Success in College and Life

Students will learn best practices for academic, career, and personal success. Students will discover their individual strengths, interests, and values to create a personalized plan; select and utilize resources that are applicable to their growth and success; and engage as active and responsible members of the academic community. This course should be taken during a student's first semester of college work at Oklahoma City Community College and is a required course in degree plans to satisfy the Life Skills requirement.

**Prerequisites:** ENGL 0106 or adequate reading/writing assessment scores

**Credits:** 1