5-Year Plan for Assessment of Program Learning Outcomes

AA/AS Degree

I. Program Information

Division:

SEM

Name of Program:

Mathematics (including as a component of the Pre-Engineering program)

Certificates Embedded in Program:

None

Assessment Plan for Following Five Years:

FY 2021 – FY 2025 (July 1, 2020 – June 30, 2025)

Faculty Who Prepared Plan:

Program Chair: Christopher Oehrlein Faculty: Daniel Benton, Paul Buckelew, Ken Harrelson, Gail Malmstrom, Jay Malmstrom, Charles Nunley

Date Submitted by Faculty:

November 16, 2018 – first version submitted for Academic Outcomes Assessment Committee April 19, 2019 – revised version submitted to division dean for review

Division Dean:

C. Max Simmons

Date Submitted by Dean:

May 3, 2019

II. Institutional Mission or End Statement Reference:

Institutional Mission:
OCCC provides broad access to learning that empowers students to complete a certificate or degree and that enriches the lives of everyone in our community.

ENDS

- Access: Our community has broad access to valuable certificate and degree programs, and non-credit educational opportunities and events.
- Student Success: Our students successfully complete their academic courses, persist in college and earn certificates or degrees at OCCC or another institution.
- Workforce Development: Our graduates earn higher-level degrees or are successful in technical and professional careers.
- Community Development: Our community's quality of life is enriched through our educational, artistic and recreational programs and events.

III. Program Learning Outcomes:

List all program learning outcomes for the program designated above. There should be 5-10 program learning outcomes total.

Under each outcome, list the measures. There should be at least 1 measure per outcome, but there can be up to 3 measures per outcome.

Indicate which outcome(s) will be assessed in each year of this plan. Only 1-3 outcome(s) should be assessed in a particular year.

All learning outcomes for this program will be assessed over the five-year cycle of this plan. Annual reports will evaluate only the outcome(s) designated for that year. The program review (or accreditation process for programs with external accreditation) will report on all program learning outcomes.

Outcome 1 (required):

The learner will apply calculus concepts and techniques to construct solutions to problems related to physics and engineering.

Measure 1 (required): Students in MATH 2413 (Intro to ODE) will model and solve a mixture problem with a first-order, linear ordinary differential equation.	☐**Direct** ☐Indirect (required)	Anticipated Target (required): 75% of students who have successfully completed MATH 2104 and MATH 2214 will correctly model and solve the problem. (Modeling means writing or deriving an equation that reflects the parameters of the stated problem.)
Measure 2: Percentages of subsets of students who successfully complete the task given in Measure 1	☐Direct ☐Indirect	Anticipated Target:
Measure 3:	☐Direct ☐Indirect	Anticipated Target:

Year Outcome 1 will be assessed (required):

2022, 2024

Outcome 2 (required):

The learner will classify algebraic functions based on their end behavior.

Measure 1 (required): Students in MATH 2104 (Calculus & Anal. Geom. I) will determine the limits at positive and negative infinity of linear, polynomial, exponential, and logarithmic functions.	☐**Direct** ☐Indirect (required)	Anticipated Target (required): 75% of students who have successfully completed MATH 1533 at OCCC will correctly classify at least 80% of the function end behaviors.
Measure 2: Percentages of subsets of students who successfully complete the task given in Measure 1	☐Direct ☐ **Indirect**	Anticipated Target: Students who have successfully completed MATH 1533 at OCCC will correctly classify at least 80% of the function end behaviors at a rate at least equal to students who placed directly into MATH 2104 without taking MATH 1533.
Measure 3:	☐Direct ☐Indirect	Anticipated Target:

Year Outcome 2 will be assessed (required):

2022, 2024

Outcome 3 (required):

After successful completing calculus courses, students will succeed in sophomore level physics and engineering courses that require calculus as a prerequisite.

Measure 1 (required): We will use success rates (A,B,C) of those students in Engineering Physics I who have completed Calculus and Analytic Geometry I at OCCC with a C or better in the previous semester.	☐Direct ☐ **Indirect** (required)	Anticipated Target (required): Seventy percent of students completing MATH 2104 at OCCC with a grade of C or higher will attain a grade of C or better in PHYS 2014 in the following semester.
Measure 2: We will use success rates (A,B,C) of those students in Engineering Physics II who have completed Calculus and Analytic Geometry II at OCCC with a C or better in the previous semester.	☐Direct ☐ **Indirect**	Anticipated Target: Seventy percent of students completing MATH 2214 at OCCC with a grade of C or higher will attain a grade of C or better in PHYS 2114 in the following semester.
Measure 3:	☐Direct ☐Indirect	Anticipated Target:

Year Outcome 3 will be assessed (required):

2022, 2024

Outcome 4 (required):

The learner will demonstrate the relationship between derivatives of functions and integrals of functions.

Measure 1 (required): Students in MATH 2314 (Calculus & Anal. Geom. III) will set up and compute a double integral with non-constant limits of integration.	☐**Direct** ☐Indirect (required)	Anticipated Target (required): 75% of students who have successfully completed MATH 2104 and MATH 2214 at OCCC will correctly determine the limits of integration for the double integral and correctly compute the double integral.
Measure 2: Percentages of subsets of students who successfully complete the task given in Measure 1	☐Direct ☐ **Indirect**	Anticipated Target: Students who have successfully completed MATH 2104 and MATH 2214 at OCCC will successfully complete the task given in Measure 1 at a rate at least equal to those students who took the prerequisite courses elsewhere.
Measure 3:	☐Direct ☐Indirect	Anticipated Target:

Year Outcome 4 will be assessed (required):

2021, 2023, 2025

Outcome 5 (required):

The learner will reorganize graphs of trigonometric functions to reflect the relationships among function, derivative (rate of change), and integral (accumulation).

Measure 1 (required): Students in MATH 2104 (Calculus & Anal. Geom. I) will rearrange a given set of three graphs of sine or cosine functions in the order: antiderivative, function, derivative.	☐**Direct** ☐Indirect (required)	Anticipated Target (required): 75% of students who successfully completed MATH 1613 at OCCC will rearrange the graphs in the correct order.
Measure 2: Percentages of subsets of students who successfully complete the task given in Measure 1	☐Direct ☐ **Indirect**	Anticipated Target: Students who have successfully completed MATH 1613 at OCCC will correctly rearrange the graphs at a rate at least equal to students who placed directly into MATH 2104 without taking MATH 1613.
Measure 3:	☐Direct ☐Indirect	Anticipated Target:

Year Outcome 5 will be assessed (required):

2021, 2023, 2025

(Only 5 outcomes are required. Additional outcomes from 6 through 10 are available if needed.)

Outcome 6:

Students completing MATH 1533 or MATH 1613 will succeed in MATH 2104 at least at the same rate as those students entering directly into MATH 2104.

Measure 1 (required): We will use success rates (A,B,C) of those students in Calculus & Analytic Geometry I who have completed Precalculus and Trigonometry at OCCC with a C or better in the previous semester.	☐Direct ☐ **Indirect** (required)	Anticipated Target (required): Seventy percent of students completing MATH 1533 and 1613 at OCCC with a grade of C or higher will attain a grade of C or better in MATH 2104 in the following semester.
Measure 2:	☐Direct ☐Indirect	Anticipated Target:
Measure 3:	☐Direct ☐Indirect	Anticipated Target:

Year Outcome 6 will be assessed (required):

2021, 2023, 2025

IV. Program Learning Outcomes and Courses

Please check the program learning outcome associated with the courses in the program.

All core courses must address at least 1 program learning outcome.

Support courses should address outcomes. Some support courses are required by a university for transfer. Please list and check any support courses applicable to the outcome.

Program Learning Outcomes:	O 1	O 2	O 3	O 4	O 5	O 6	O 7	O 8	O 9	O 10
Core Courses:										
MATH 2104	X	X	X	X	X	X				
MATH 2214	X		X	X						
MATH 2314				X						
Support Courses:										
MATH 1533		X				X				
MATH 1613					X	X				
MATH 2413	X									