

OA Plan Summary (to be completed last)

Please complete the following form with a summary and overview of your outcomes, assessment instrument, and scoring information.

Course: MA XXX

Planning Semester: FA 07

Workgroup Members:

SLO:	The student will be able to set up , evaluate , and interpret integrals that model applications in physics.
Check the appropriate box: <input checked="" type="checkbox"/> Gen Ed Competency -Competency Area: _Scientific and Quantitative Reasoning _____ <input type="checkbox"/> Course Specific Outcome	
Assessment Instrument:	Short answer question given in a test asking students to interpret the integral of a physical function.
Scoring:	The question is graded out of 7 points, with specific points allocated to every important component of interpretation of the integral.

SLO:	The student will be able to solve selected differential equations using graphical , numerical , and analytical methods.
Check the appropriate box: <input type="checkbox"/> Gen Ed Competency -Competency Area: _____ <input checked="" type="checkbox"/> Course Specific Outcome	
Assessment Instrument:	Question given in a test asking to solve a selected differential equation by an analytical method.
Scoring:	The question is graded out of 15 points, with specific points allocated to every component of the analytical method .

SLO:	The student will be able to represent function with power series and approximate functions with Taylor polynomials.
Check the appropriate box: <input type="checkbox"/> Gen Ed Competency -Competency Area: _____ <input checked="" type="checkbox"/> Course Specific Outcome	
Assessment Instrument:	Question given in a test asking to represent a function by a Taylor polynomial of degree 2 and using this expansion to approximate a specific number.
Scoring:	The question is graded out 11 points with specific points allocated to the expansion of the function in a power series and the use of the power series to approximate a specific number.

Part I- Choosing What to Assess

Instructions: Choose at least 3 Student Learning Outcomes(SLO's) to assess and give a reason for choosing each SLO. Selected SLO's can be from the primary collegewide SLO's for the course or can be supporting outcomes if there is specific reason for assessing the supporting outcomes and the discipline agrees they are important to assess.

Note: Gen Ed courses must select at least one SLO that aligns with one of the primary competencies for the course. For those SLO's please identify the competency to be assessed in your reason for selecting this SLO.

(Please delete the instructions for completing this section.)

SLO #1: The student will be able to set up, evaluate, and interpret integrals that model applications in physics.

Reason selecting this SLO:

SLO #2:

Reason selecting this SLO:

SLO #3: The student will be able to represent function with power series and approximate functions with Taylor polynomials.

Reason selecting this SLO:

Part II: Planning your Assessment

Student Supporting Activities

One of the key benefits of outcomes assessment is that it facilitates the alignment between student performance and instruction by providing data about student performance on discrete outcomes in the course. On this worksheet, you will look at the types of activities which might be used to give students opportunities to practice with and reach the stated outcomes.

Instructions: List each SLO being assessed. Then make a list of instructional activities which might be used to facilitate student achievement of the outcome. If activities support multiple outcomes, they can be listed for each appropriate outcome. Please survey instructors who teach the course to get a comprehensive list of potential instructional activities.

Student Learning Outcome #1: The student will be able to set up, evaluate, and interpret integrals that model applications in physics.

Supporting Student Activities:

Class Discussion

Text Readings

Modeling of problem solving in class

Practice problem solving in groups

Practice problem solving at home

Demonstration of application of integrals to real world situations

Student Learning Outcome #2: The student will be able to solve selected differential equations using graphical, numerical, and analytical methods.

Supporting Student Activities:

Class Discussion

Text Readings

Modeling of problem solving in class

Practice problem solving in groups

Practice problem solving at home

Student Learning Outcome #3: The student will be able to represent function with power series and approximate functions with Taylor polynomials.

Supporting Student Activities:

Class Discussion

Text Readings

Modeling of problem solving in class

Practice problem solving in groups

Practice problem solving at home

Part III A: The Assessment Tool

Student Learning Outcome #1: The student will be able to set up, evaluate, and interpret integrals that model applications in physics.

1. The table shows the velocity $v(t)$ in ft/s of a bicycle every 2 seconds.

t (s)	0	2	4	6	8
v (ft/s)	24	22	16	10	0

a) What does $\int_0^8 v(t)dt$ tell about the bicycle? Be specific and include the correct units

b) Use the Trapezoidal Rule with two trapezoids to approximate $\int_0^8 v(t)dt$.

Scoring:

Part a: 6 points (satisfactory score: 4 or more)

3 points for “total distance traveled”

1 point for “ft”

2 points for “from $t = 0$ to $t = 8$ s.” or “for the 8 seconds”

Scoring part b: 8 points (satisfactory score: 6 or better)

7 points for writing correct expression for sum of two trapezoidal areas

1 point for correct answer with correct units

Student Learning Outcome #2: The student will be able to solve selected differential equations using graphical, numerical, and analytical methods.

Solve $\frac{dy}{dx} = \frac{xe^{2x}}{y}$ for y by separating the variables.

Scoring:

15 points (satisfactory score – 11 or better)

2 points to separate the variables

1 point to take the integral of both sides

1 point to integrate y

6 points for integration by parts work through $uv - \int vdu$

2 points to integrate $\frac{1}{2}e^{2x}$

1 point for + C

2 points to solve for y

Student Learning Outcome #3: The student will be able to represent function with power series and approximate functions with Taylor polynomials.

The Taylor's Series of the function f at a is

$$f(x) = f(a) + \frac{f'(a)}{1!}(x-a) + \frac{f''(a)}{2!}(x-a)^2 + \dots + \frac{f^{(n)}(a)}{n!} + \dots$$

- Find the Taylor polynomial of degree 2 for $y = x^{1/3}$ with center $a = 8$.
- Use the result from part (a) to approximate the value of $\sqrt[3]{9}$. Give your answer to 4 decimal places.

Scoring:

Part a: 8 points (satisfactory score: 6 or better)

2 points - 1 point for y' and 1 point for y''

3 points - 1 point each for evaluating y, y', and y'' at x = 9

2 points - write polynomial

1 point - simplify polynomial

Part b: 3 points (satisfactory score: 2 or better)

2 points for correctly substituting into part a

1 point for writing approximation to 4 decimal places

Part III B: Scoring the Assessment

Use the following to score the MA 182 Assessments

SLO #1

Part a: 6 points (satisfactory score: 4 or more)

3 points for “total distance traveled”

1 point for “ft”

2 points for “from $t = 0$ to $t = 8$ s.” or “for the 8 seconds”

Part b: 8 points (satisfactory score: 6 or better)

7 points for writing correct expression for sum of two trapezoidal areas

1 point for correct answer with correct units

SLO #2-

Scoring – 15 points (satisfactory score – 11 or better)

- 2 points to separate the variables
- 1 point to take the integral of both sides
- 1 point to integrate y
- 6 points for integration by parts work through $uv - \int vdu$
- 2 points to integrate $\frac{1}{2}e^{2x}$
- 1 point for $+ C$
- 2 points to solve for y

SLO #3-

Part a Scoring: 8 points (satisfactory score: 6 or better)

- 2 points - 1 point for y' and 1 point for y''
- 3 points - 1 point each for evaluating y , y' , and y'' at $x = 9$
- 2 points – write polynomial
- 1 point – simplify polynomial

Part b Scoring: 3 points (satisfactory score: 2 or better)

- 2 points for correctly substituting into part a
- 1 point for writing approximation to 4 decimal places

Scoring Results in Spreadsheet

Professors will enter each student’s score for 1a, 1b, 2, 3a, and 3b. Any number of points may be given for partial credit on each item.

Part III C: Data Collection Page

Student Learning Outcome #1: The student will be able to set up, evaluate, and interpret integrals that model applications in physics.

Column Heading(s)	Min/Max Score	Decimal Allowed?	Satisfactory Score
v(t) Integral A	0 Min/6 Max	No	4 or more
v(t) Integral B	0 Min/ 8 Max	No	6 or more

Student Learning Outcome #2: The student will be able to solve selected differential equations using graphical, numerical, and analytical methods.

Column Heading(s)	Min/Max Score	Decimal Allowed?	Satisfactory Score
Separable DE	0 Min/ 15 Max	No	11 or more

Student Learning Outcome #3: The student will be able to represent function with power series and approximate functions with Taylor polynomials.

Column Heading(s)	Min/Max Score	Decimal Allowed?	Satisfactory Score
Taylor Poly A	0 Min/ 8 Max	No	6 or more
Taylor Poly B	0 Min/ 3 Max	No	2 or more