# Assessment: Course Four Column

## Courses (MATH) - Math

### MATH 285:Differential Equations

| Course Outcomes | Assessment Measures | Results | Actions |
|---|---|---|---|
| **Solve simple first order differential equations -** Solve simple first order differential equations.<br>**Course Outcome Status:** Active<br>**Next Assessment:** 2021-2022<br>**Start Date:** 10/25/2017 | **Exam -** Exam 1, problems 1, 2, 3, 4. Final Exam, problems 1, 2<br>**Criterion:** NA | **Reporting Period:** 2016-2017<br>**Criterion Met:** N/A<br>Student success percentage by problem:<br><br>Exam 1<br>Problem #<br>1: 100%<br>2: 100%<br>3: 100%<br>4: 100%<br>Final Exam<br>Problem #<br>1: 100%<br>2: 100% (10/25/2017) | **Action:** I'm quite pleased with these results, the student clearly understood how to handle first order differential equations when given in direct form.  Taken together with the following outcome, this does tell me I need to put greater focus on helping students extract differential equations from an applied situation. (10/25/2017) |
| **Solve a first order physical system -** Set up and solve a first order physical system.<br>**Course Outcome Status:** Active<br>**Next Assessment:** 2021-2022<br>**Start Date:** 10/25/2017 | **Exam -** Exam 1, problem 5<br>**Criterion:** NA | **Reporting Period:** 2016-2017<br>**Criterion Met:** N/A<br>Exam 1<br>Problem #<br>1:  0% (student did not attempt problem.) (10/25/2017) | **Action:** Since the student did not attempt the problem, I have to assume she did not know how to set up the problem.  When I conduct this course again, I plan to put more applied problems into the non-assessed quizzes.  Possibly, I can use these as an opportunity to break down the problem into steps to help the student extract the needed equations. (10/25/2017) |

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|---|---|---|---|
| **Simple second order differential equation -** Solve a simple second order differential equation.<br>**Course Outcome Status:** Active<br>**Next Assessment:** 2021-2022<br>**Start Date:** 10/25/2017 | **Exam -** Exam 2, problems 1, 2, 3<br>Final Exam, problem 3<br>**Criterion:** NA | **Reporting Period:** 2016-2017<br>**Criterion Met:** N/A<br>Exam 2<br>Problem #<br>1: 100%<br>2: 100%<br>3: 100%<br>Final Exam<br>Problem #<br>3: 0% (10/25/2017) | **Action:** The initial results were promising, but then the student was unable to complete the problem correctly on the final. There was a large amount of time between the assessed exam and the final, so I can possibly remedy the situation by introducing a review assignment before the final. This is what I will try the next time I conduct this course. (10/25/2017) |
| **Set up and solve a second order physical system -** Set up and solve a second order physical system.<br>**Course Outcome Status:** Active<br>**Next Assessment:** 2021-2022<br>**Start Date:** 10/25/2017 | **Exam -** Exam 2, problem 5<br>Final Exam, problem 5<br>**Criterion:** NA | **Reporting Period:** 2016-2017<br>**Criterion Met:** N/A<br>Exam 2<br>Problem #<br>5: 0%<br>Student did not attempt.<br>Final Exam<br>Problem #<br>5: 0%<br>Student did not attempt (10/25/2017) | **Action:** Again, these were application problems and it appears the student was not able to extract the information needed to build a differential equation. I will be giving more application problems on the quizzes so the student has more graded practice and feedback on them. (10/25/2017) |
| **Laplace transform of a function -** Determine the Laplace transform of a function.<br>**Course Outcome Status:** Active<br>**Next Assessment:** 2021-2022<br>**Start Date:** 10/25/2017 | **Exam -** Exam 3, problems 3, 4, 5<br>Final Exam, problem 8<br>**Criterion:** NA | **Reporting Period:** 2016-2017<br>**Criterion Met:** N/A<br>Exam 3<br>Problem #<br>3: 0%<br>4: 0%<br>5: 100%<br>Final Exam<br>Problem #<br>8: 0%<br>Student did not attempt problem (10/25/2017) | **Action:** I am extremely concerned with these outcomes. The Laplace transform is extremely important in higher-level mathematics classes and in many applied fields. In both unsuccessful problems the student's error was in finding the correct partial fraction decomposition needed for the transform (a calculus concept). I plan to add a review on partial fraction decomposition next time I conduct this course. (10/25/2017) |
| **Solve a linear second order DE using Laplace transforms -** Solve a linear | **Exam -** Exam 3, problems 3, 4.<br>Final Exam, problem 8 | **Reporting Period:** 2016-2017<br>**Criterion Met:** N/A | **Action:** Since the student was unable to correctly find the |

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|---|---|---|---|
| second order DE using Laplace transforms<br>**Course Outcome Status:** Active<br>**Next Assessment:** 2021-2022<br>**Start Date:** 10/25/2017 | **Criterion:** NA | Exam 3<br>Problem #<br>3: 0%<br>4: 0%<br>Final Exam<br>Problem #<br>8: 0%<br>Student did not attempt problem (10/25/2017) | Laplace transform for the differential equations, she was unable to correctly solve the equations. As mentioned in outcome #5, I plan to add a review of partial fractions to try and remedy this situation. (10/25/2017) |
| **Solve a DE using series expansion techniques -** Solve a DE using series expansion techniques.<br>**Course Outcome Status:** Active<br>**Next Assessment:** 2021-2022<br>**Start Date:** 10/25/2017 | **Exam -** Exam 3, problems 1, 2<br>Final Exam, problems 6, 7<br>**Criterion:** NA | **Reporting Period:** 2016-2017<br>**Criterion Met:** N/A<br>Exam 3<br>Problem #<br>1: 100%<br>2: 100%<br>Final Exam<br>Problem #<br>6: 100%<br>7: 100% (10/25/2017) | **Action:** In both cases the student was very successful on this outcome. She perfectly used series expansion techniques. I do not plan to change anything about this in my next course. (10/25/2017) |
| **Solve a boundary value problem -** Solve a boundary value problem.<br>**Course Outcome Status:** Active<br>**Next Assessment:** 2021-2022 | **Exam -** Exam 4, problems 3, 4, 5<br>Final Exam, problem 10<br>**Criterion:** NA | **Reporting Period:** 2016-2017<br>**Criterion Met:** N/A<br>Exam 4<br>Problem #<br>3: 0%<br>4: 100%<br>5: 100%<br>Final Exam<br>Problem #<br>10: 100% (10/25/2017) | **Action:** The unsuccessful problem involved Euler's method, where the student made a "false start" and then was unable to complete the problem due to the start being incorrect and confusing. I will try and find or create a better explanation video for Euler's method for the next time I conduct this course. (10/25/2017)<br><br>**Follow-Up:** There was only one student in this course, hence the drastic contrast in success and nonsuccess percentages. I think in general the course went well, but the student was less dedicated than I expected in an upper level student and required much pushing to complete assignments on time. I am not sure I liked the book used for the |

course either.  I chose it because (a) it had been used here before and (b) it had access to WebAssign homework for the student, which was a good way to provide the student with instant feedback.  On reading through the book, I was not happy with the way it explained many of the concepts.  I will probably look in to finding a new book when I conduct this class again in the future. (10/25/2017)