KOCW Content Development Application

<table>
<tr><td rowspan="3">Applicant</td><td colspan="2">Faculty Department Major   SIRA</td><td></td><td></td></tr>
<tr><td>Name</td><td>Richard Fuchs</td><td>Position</td><td>Professor</td></tr>
<tr><td>Contact</td><td></td><td>E-mail</td><td></td></tr>
<tr><td rowspan="5">Content</td><td>Subject</td><td colspan="3">Mathematics for Engineers</td></tr>
<tr><td>Credit</td><td colspan="3">1 credits</td></tr>
<tr><td>Field</td><td colspan="3">Liberal Arts ( ) Social Science ( ) Engineering

(X) Natural Science ( ) Education ( )

Medicine or Pharmaceutical Study ( ) PE or Art ( )</td></tr>
<tr><td>Outline of the Class</td><td colspan="3">Review (Analytic Geometry, Trig Functions, Variable Conventions)

Rules of Differentiation (Basic Rules and Chain Rule) and Differential

Operator Differentiation of Exponential and Log Functions

Differentiation of Trig Functions

Implicit Differentiation

Related Rates (Rates of Change)

Maxima and Minima

Integration

Techniques of Integration

Double and Triple Integrals

Differential Equations

Mathematics of Electrical

Systems</td></tr>
<tr><td>Weeks</td><td colspan="3">12 weeks</td></tr>
</table>

	Class Type	Video ( ) / Recorded Voice (X)
Will you use contents for a regular class?		Yes ( ) / No (X) ※ If you intend to run your contents for a credit class, please consult staff at CTL.

I submit this document for the KOCW Development Project.

2022.04.27

Applicant : <u>Richard Fuchs</u> (Sign): *R. Wayne Fuchs*

Head of CTL, Woo-Song University

KOCW Content Development Application

1. **Outline**

   가. Name of a Class

Class Name	Mathematics for Engineers		
Semester	2022학년도 1학기	**Division**	Major (X) Liberal Art ( )

   나. Goal of a Class

This course will be an introduction to the core mathematics required by engineers. It will conclude with a section on applied mathematics in electrical engineering. This course will strengthen the mathematical competencies of students and help them advance in their future courses in railroad engineering.

   다. Method

   (1) Methodology : (ex- theory-focused, discussion-oriented, or Practice-centered)

Lectures will begin by establishing a grounding in the basic theory that underlies the topic of study. Theory will then be supplemented with examples that reinforce the concepts being taught. More advanced examples, derived from real engineering problems, will be presented to further strengthen understanding of the material.

   (2) Tools : (ex- lecture note, PPT, Word Software, Video)

   - Lecture Notes

   - PPTs

   - PDFs

   - Videos

2. Weekly Plan

Week	Content	How to Operate		
		Methodology	Material	Reference
1	Review (Analytic Geometry, Trig Functions, Variable Conventions)	Lecture Notes PPTs	Original	Created by Instructor
2	Rules of Differentiation (Basic Rules and Chain Rule) and Differential Operator	Lecture Notes PPTs	Original	Created by Instructor
3	Differentiation of Exponential and Log Functions	Lecture Notes PPTs	Original	Created by Instructor
4	Differentiation of Trig Functions	Lecture Notes PPTs	Original	Created by Instructor
5	Implicit Differentiation	Lecture Notes PPTs	Original	Created by Instructor
6	Related Rates (Rates of Change)	Lecture Notes PPTs	Original	Created by Instructor
7	Maxima and Minima	Lecture Notes PPTs	Original	Created by Instructor
8	Integration	Lecture Notes PPTs	Original	Created by

				Instructor
9	Techniques of Integration	Lecture Notes PPTs	Original	Created by Instructor
10	Double and Triple Integrals	Lecture Notes PPTs	Original	Created by Instructor
11	Differential Equations	Lecture Notes PPTs	Original	Created by Instructor
12	Mathematics of Electrical Systems	Lecture Notes PPTs	Original	Created by Instructor

※ You can freely complete the content sections based on the feature of the class.

3. How are you going to use your class?

For a credit class ( ), For a non-credit class ( ), For a public view (X)

4. Expected Outcome

This course will provide students with the mathematical skill set they require to succeed in their program in SIRA. Students will gain a greater appreciation and deeper understanding of the systems used in modern railways. Overall, it will provide students with a more robust skill set that will enhance their skills in solving engineering problems.