Florida Institute of Technology

ADDIMG A NEW COURSE TO THE CURRICULUM

This course is available for student registration only after the approval process has been completed.

<table>
<thead>
<tr>
<th>SUBJECT</th>
<th>E</th>
<th>D</th>
<th>S</th>
<th>COURSE NO.*</th>
<th>CREDIT HOURS</th>
<th>TERM TO BE ADDED TO THE FILE</th>
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<tbody>
<tr>
<td>EDS</td>
<td>4</td>
<td>7</td>
<td>0</td>
<td>1</td>
<td>3</td>
<td>Fall 2013 (e.g., Fall 2010)</td>
</tr>
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*Justify level if 1000-level+ and no co- or prerequisites.

<table>
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<tr>
<th>CLASS HOURS</th>
<th>LECTURE HOURS</th>
<th>LAB HOURS</th>
<th>CONTACT HOURS (CEU ONLY)</th>
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<tr>
<td>45</td>
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DEPARTMENT: Education and Interdisciplinary Studies

SCHEDULE TYPE: Lecture (A)

☐ COLLEGE OF AERONAUTICS – 23
☐ COLLEGE OF PSYCHOLOGY AND LIBERAL ARTS – 25
☐ NATHAN M. BISK COLLEGE OF BUSINESS – 24
☒ COLLEGE OF SCIENCE – 26
☐ COLLEGE OF ENGINEERING – 1
☐ EXTENDED STUDIES DIVISION / NATHAN M. BISK COLLEGE OF BUSINESS – 90

COMPUTER TITLE: Restricted to 25 characters, including spaces

Projects in Education

Dual-Prefix, Bi-Level, Full-Load? ☐ Yes ☒ No

CATALOG TITLE: Project-Based Instruction in Mathematics and Science Education

CATALOG DESCRIPTION OF COURSE: Restricted to 350 characters, including spaces

Covers project-based instruction (PBI) as a mathematics and science teaching method. Requires teams to develop and teach a project-based unit of instruction in a secondary school setting. Focuses on the tenets, planning and implementation of PBI, national and state curriculum and instruction standards, and how children learn mathematics and science.

This description has been approved by the catalog office: Emory 8/21/12

In addition, please attach a course syllabus and/or more detailed description.

RESTRICTIONS
☒ Prerequisite: EDS 2502
☒ Prerequisite: EDS 2503
☒ Prerequisite: EDS 4502

☐ Corequisite: Course Number (e.g., EDS 2504)
☐ Corequisite: Course Number (e.g., EDS 2505)

GRADEs TO BE ISSUED
☒ A, B, C, D, F
☐ A, B, C, D, E, F, CEU/Audit
☐ CEU
☐ S, U
☐ P, F
☐ Other

ADDITIONAL RESTRICTION

(e.g., Major, Class Level, Department Head Approval)

If this course replaces a course currently offered in BANNER, please indicate old course information and the date/term the course may be removed from the system.

SUBJECT: Alpha Prefix (e.g., CSE) | COURSE NO. (e.g., 1301) | TERM TO INACTIVATE

APPROVALS: Upon completion of appropriate department approvals, submit form to Chair, Graduate Council, or Chair, Undergraduate Curriculum Committee for approval below and forward to Catalog Director.

Originator: M. Harkness 8/22/12
Department Head/Program Chair: M. Bragg 8/23/12
Dean or Associate Dean: M. Harkness 8/23/12

REGISTRAR’S USE ONLY

SCACRSE: Operator Init. Date
SCADETL: Date
SCAPREQ: Date
SCABASE: Date
Florida Institute of Technology

Department of Education and Interdisciplinary Studies

EDS 4701: Project-based Instruction in Mathematics and Science Education
Credit Hours: 3 credits
Instructors: Mr. Joseph Laub and Ms. Melissa Young

Course Prerequisites:
• Admission to the FIT4UTeach
• Completion of EDS 2501-Step 1, EDS 2502-Step 2, EDS 4503-Knowing and Learning with grades of C or better

Course Overview and Description:
This course provides an overview of project-based instruction (PBI) as a mathematics and science teaching method. Students will develop and teach a project-based unit of instruction in a local high school setting. PBI is a contemporary teaching method that engages learners in exploring important and meaningful questions through a process of investigation and collaboration. In an era of high stakes testing and accountability, PBI incorporates national and state standards, rigorous challenges and valid assessment methods. In addition, it encourages autonomous learning for students and the development of higher-level cognitive skills. Through a dynamic process of investigation and collaboration and using the same processes and technologies that real scientists and engineers use, students work in teams to formulate questions, make predictions, design investigations, collect and analyze data, and share ideas around issues of concerns. During the semester, we will focus on the following five components as they relate to middle and high school science and mathematics:
1) Tenets of PBI
2) Planning and implementing PBI
3) National and state curriculum and instruction standards related to the nature of science and mathematics
4) How children learn science and mathematics through PBI
5) Assessment as a tool for monitoring and enhancing student learning in PBI classroom settings

Course Objectives:
Competence is continually built as students read about and discuss the principles of PBI, reflect on observations of project-based learning environments in high school settings, and incorporate what they are learning into the design of problem-based lessons and ultimately, an entire project-based unit.
Students will:
• Develop an understanding of
  o the tenets of PBI and its role in shaping the classroom environment and children’s science and mathematics learning
  o how PBI, as a method of instruction, supports meaningful science and mathematics learning in secondary classrooms as indicated by national and state standards.
• Develop an appropriate level of competence in designing, preparing for and implementing PBI
• Observe and analyze the implementation of project-based science and mathematics instruction in local public school classrooms.

This course in subject specific methods of teaching mathematics and science will support students’ beginning knowledge, skills, and dispositions related to the following Florida Educator Accomplished

Page 1, Revised 8/22/12

Methods of Instruction:
Face-to-face and field placement in secondary school classroom settings

Course Meeting Schedule:
15 weeks; 1-two-hour per week face-to-face class session, 3 hours per week field placement

Course Requirements:

1. **Class Meetings.** Class participation is required and determines a portion of your grade for the course. Students who are unable to attend class should review course materials in consultation with the instructor.

2. **Field Experience.** A major portion of this course is the field experience (3 hours per week). Students will complete a 15-week field experience. Each student will be assigned to work with one cooperating teacher for 3 hours per week. During the first half of the field experience sessions for the placement, students will observe their cooperating teacher. They will record their observations and answer specific focus questions, and then post them to the class website. The information gathered in these observations will be used for various course components (e.g., class discussions, planning of PBI unit, support contexts of assigned readings etc.). During the second half of the placement sessions, students will prepare a PBI lessons and implement these lesson plans in the presence of their cooperating teacher.

Course Evaluation:

(A) **In-class discussion leadership (20%)**: Each student will participate in weekly in-class discussions and related activities. Each student will be assigned as lead discussant at two times over the semester. On the assigned dates, the student will be required to prepare a set of questions to guide the face-to-face discussion and where possible include classroom observations and in-class activities to further extend and deepen the conversations.

(B) **Participation in class (10%)**: This grade is based upon student attendance, preparation, and contribution to in-class and online discussions. Excessive absences and lack of substantive contribution will affect this portion of your grade.

(C) **Lesson Preparation and Implementation (30%)**: Students will design 3 interactive lessons using the PBI teaching approach and implement these lessons in the field experience with the guidance of their instructor and cooperating teachers. Students will also prepare 3 brief reports reflecting on their successes and areas for growth.

(D) **Development and Presentation of Project Based Unit of Instruction (40%)**: Students will work in a collaborative group to prepare a PBI unit. The unit should be a minimum of 10 days, but could be longer depending on the topic chosen. The unit will be prepared to meet curricular objectives and state and national standards. The unit must be well constructed based on criteria outlined in class. The final unit will be presented to the class during the time allotted for the final exam.

Grading Scale:
A = (90 - 100) %
<table>
<thead>
<tr>
<th>WK</th>
<th>Course Topics</th>
<th>Readings &amp; Course Assignment</th>
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<tbody>
<tr>
<td></td>
<td>State Mathematics Standards</td>
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<td></td>
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<td>Page</td>
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<td>Resource Details</td>
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<td>15</td>
<td>PBI Unit Practice</td>
<td>FEAPs 2, 8, 10</td>
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<tr>
<td>16</td>
<td>PBI Unit Practice</td>
<td>FEAP 1, 3</td>
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Required Texts


Required Readings


Next Generation Sunshine State Standards (http://www.floridastandards.org/Standards/FLStandardSearch.aspx)


Other Resources


Academic Integrity

Students are expected to act in accordance with the Florida Institute of Technology policy on academic integrity.

Cheating, lying, misrepresentation, or plagiarism in any form is unacceptable and inexcusable behavior and may result in a reduction of course grade and a report to university officials.

Attendance and Make-up Exams and Assignments

Students are expected to attend all class sessions. Much of the work in this course occurs during class sessions and cannot be repeated outside class in an equivalent manner. Students who have difficulty meeting this expectation should speak with the instructor to determine whether make-up assignments or exams are possible. Absence for permitted religious reasons will be handled accordingly.

Accommodations for Students with Disabilities

If you require classroom accommodation because of a disability, you must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to you, which you then give to the instructor when requesting accommodation. The College is committed to providing reasonable accommodations to assist students in their coursework.

Counseling and Student Health

Students with academic concerns related to this course should contact the instructor in person or via email. Students also may occasionally have personal issues that arise in the course of pursuing higher education or that may interfere with their academic performance. If you find yourself facing problems affecting your coursework, you are encouraged to talk with an instructor.
PBI Course Overview and Description:
This course provides an overview of project-based instruction (PBI) as a mathematics and science teaching method. Students will develop and teach a project-based unit of instruction in a local high school setting. PBI is a contemporary teaching method that engages learners in exploring important and meaningful questions through a process of investigation and collaboration. In an era of high stakes testing and accountability, PBI incorporates national and state standards, rigorous challenges and valid assessment methods. In addition, it encourages autonomous learning for students and the development of higher-level cognitive skills. Through a dynamic process of investigation and collaboration and using the same processes and technologies that real scientists and engineers use, students work in teams to formulate questions, make predictions, design investigations, collect and analyze data, and share ideas around issues of concerns. During the semester, we will focus on the following five components as they relate to middle and high school science and mathematics:

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5) Assessment as a tool for monitoring and enhancing student learning in PBI classroom settings
Florida Institute of Technology

ADDING A NEW COURSE TO THE CURRICULUM

This course is available for student registration only after the approval process has been completed.

Subject: E D S Course No.: 4131 Credit Hours: 3 Term to be added to the file: Fall 2013

*Justify level if 1000-level+ and no co- or prerequisites

Restricted to program chair approval

Class Hours: 45 Lecture Hours: 45 Lab Hours: Contact Hours (CEU Only)

Department: Education and Interdisciplinary Studies Schedule Type: Lecture (A)

☐ College of Aeronautics – 23 ☐ College of Psychology and Liberal Arts – 25

☐ College of M. Bisk College of Business – 24 ☐ College of Science – 26

☐ College of Engineering – 1 ☐ Extended Studies Division / Nathan M. Bisk College of Business – 90

Computer Title:Restricted to 25 characters, including spaces Perspectives Sci/Math

Dual-Prefix, Bi-Level, Full-Load? ☐ Yes ☐ No

Catalog Title: Perspectives on Science and Mathematics

Catalog Description of Course: Restricted to 350 characters, including spaces

Explores how scientific investigators explain the natural world. Provides an overview of the history of sciences and mathematics to broaden comprehension. Puts work in science and mathematics pedagogy in historical context. Improves writing, research, and analysis skills.

This description has been approved by the catalog office.

EmJoy 8/21/12

Catalog Director

In addition, please attach a course syllabus and/or more detailed description.

Restrictions

☐ Prerequisite Course Number

☐ Corequisite Course Number

☐ and or

Grades to be issued

☐ A, B, C, D, F

☐ A, B, C, D, E, F, CEU/Audit

☐ CEU

☐ S, U

☐ P, F

☐ Other

Additional Restriction

Requirement: Program chair approval.

(e.g., Major, Class Level, Department Head Approval)

If this course replaces a course currently offered in BANNER, please indicate old course information and the date/term the course may be removed from the system.

Subject Prefix (e.g., CSE)

Course No. (e.g., 1301)

Term to inactivate

Approvals: Upon completion of appropriate department approvals, submit form to Chair, Graduate Council, or Chair, Undergraduate Curriculum Committee for approval below and forward to Catalog Director.

Originator

Date 8/20/12

Chair, Graduate Council

Date

Department Head/Program Chair

Date 8/22/12

Chair, Undergraduate Curriculum Committee

Date

Dean or Associate Dean

Date 8/23/12

Catalog Director

Date

Registrar’s Use Only

SACRSE SCADETL SCAPREQ SCABASE

SCARRES Operator Init. Date

Florida Institute of Technology • Office of the Registrar

150 West University Boulevard, Melbourne, FL 32901-6975 • (321) 674-8114 • Fax (321) 674-7827
EDS 4131/History ???
Perspectives on Science and Mathematics
FALL 201X

Space-Time Coordinates to be specified
Suggested: Tuesday and Thursday.

History/Humanities Professor
Office:
Office hours:
or by appointment
username@fit.edu

***************

This course will explore different ways that scientific investigators have explained the workings of the natural world. This course has four interlocking goals: to give you an overview of the history of science and mathematics for your general education and to broaden your comprehension of the subjects you will be teaching; to enable you to put this broader history and context to work in science and mathematics pedagogy; to improve your writing skills to competence or mastery; and likewise to improve your research and information analysis skills to competence or mastery. This course is designed for students in the FIT4UTeach Program.

Humanities General Education Classification
In addition to satisfying a requirement for the FIT4UTeach, this course provides 3 credits of humanities general education by introducing you to the ways that the historian/philosopher looks at science and mathematics. Discoveries in science and mathematics have not come strictly from the laboratory or desk of the experimentalist or theoretician, but rather they have originated in identifiable historical contexts. Likewise, these discoveries have to a great extent affected the history and philosophy of their times. This course will teach you to think about science and mathematics in these terms.

Student Learning Outcomes
Students will learn, practice, and appreciate the ways that historians/philosophers interpret the past and present work of scientists and mathematicians. By the end of the semester, students will:
➢ Acquire new ways to think about math and science by seeking answers to questions such as: Where did science, math, and technology come from? How have they become so important in today's world? What kinds of questions have scientists and mathematicians tried to answer and why?

➢ Learn methods of historical research, in particular analysis of the origin and reliability of print and internet sources.

➢ Read selected texts critically and participate in meaningful classroom discussions of both the content of the readings and their historical relevance.

➢ Hone your professional writing skills, especially the presentation of coherent, reasoned arguments that can be understood and evaluated by others.

➢ Prepare a 5E lesson plan incorporating some aspect of the history of science or mathematics, and practice teaching the material to your classmates.

**Basic Structure of the Class**

This class meets twice a week; on Tuesday for 50 minutes and on Thursdays for two hours. Most Tuesdays will be reserved for discussing ideas and concepts pertinent to that week's readings and lectures. As the semester progresses, Tuesdays will be used for lesson plan demonstrations. Thursdays will be mostly lecture and discussion of important historic periods, ideas and people. It will become necessary later in the semester to use some Thursdays for lesson plan demonstrations.

This is an upper-division history course. The assigned readings vary in length, and are from primary and secondary texts. The first half of the semester will have much more reading than the second half. You will also be required to do additional research and reading for the paper and the 5E lesson plan; keep this in mind when budgeting your time for this class. The class will be conducted as a mixture of lecture and discussion; attendance and participation are therefore crucial.

**Attendance, Participation, and Preparation:**

Students are expected to attend every class in a timely manner. Late arrivals are unacceptable and disruptive. Excessive lateness to class may result in a 5 point deduction from a student's cumulative Preparation and Participation component of the course grade. If your standing commitments outside of class will result in excessive lateness or absence, you should see me immediately. A sign-in sheet will be passed around at the beginning of each class. It will be your responsibility to sign this sheet. It will be the official record of attendance. You are allowed two missed classes before it negatively affects your grade, but it is always your responsibility to make up any missed information and to keep up on the progress of the class.

Class preparation and participation is critical to success in a course in which discussion is such a large portion of class time. It enriches the student's experience and it is one of the best methods for the student to assess informally how well he or she is mastering
the course materials. Each student is especially encouraged to ask questions of the
instructor regarding any matter pertinent to the class, assignments, or readings. Class
preparation and participation will count as a percentage of the student's final course
grade as indicated below. Please note that mere participation is not the same as true,
quality participation. For full consideration, evidence will need to be shown that
students have read the assigned works.

Allowances will be made for extended illnesses or other excused absences, with proper
documentation.

Class Preparation and Participation will be graded using the following methods
• **Attendance** as measured as a simple percentage of classes attended divided by the
total number of classes (minus 2)
• **Substantive participation** in class discussion and activities
• **Substantive** and **constructive** comments and critiques on your classmate's 5E
lesson plans.
• **Substantive participation** in online discussions on pertinent issues. (Excessive
substantial online discussion, especially beginning or leading discussions of topics of
interest to the class, can help mitigate a missed class.)

Your grade in this area will be affected negatively through excessive lateness, evidence
of a lack of preparation, lack of substantive participation, and being repeatedly
disruptive in class. Disrupting class can include, but need not be limited to, cell phone
ringing and usage, non-class related talking, loud and/or odiferous eating and drinking,
distraction web surfing on laptops, or any other activity that distresses me or your
classmates from our tasks.

**Assignments and Grading**

As mentioned above, this is an upper-division history course. An important part of any
historical endeavor is to write clearly, concisely, and accurately based upon primary and
secondary sources. **Successful completion of the writing assignments for this
course (see below for evaluation scale) will provide credit for 6,000 words of the Gordon Rule writing requirement, distributed as follows (with word counts):**

1. Eight short reflections (see attached Guidelines) @ 700 words each (roughly 3
doubled-spaced pages) relating to the assigned readings and the class discussion. These
will be assigned approximately every other week. The question/topic will be announced
one week prior to the due date, so that you can consider the question while you are
reading the texts. You will submit these assignments via Sakai, and I will provide
feedback (also via Sakai) within one week. The short papers will increase in complexity
throughout the semester, and at least part of the grade will depend on your
improvement from paper to paper. Note that grammar, spelling, sentence structure,
overall organization, and proper referencing will be included in the expectations for all
assignments (see attached rubric).
The essay should be brief, to the point, and directly address the topic or question being discussed. At some point in the semester you will be asked to respond to a secondary source, analyze a primary source, compare and contrast different sources, synthesize lecture, discussion, and reading to support an opinion, adapt what you are learning in class for your own purposes, and even predict the future. I suggest that you get to know chapter 5 of *A Student's Guide to History* by Jules R. Benjamin. It contains a lot of good information and instruction on how to write specific types of written assignments. I will try to point out which sections apply to each assignment, but ultimately finding help will be up to you.

Each paper will be worth 20 points. A paper will lose one point for every hour it is late. For students not requesting Gordon Rule credit, I will drop zero grades if two of the papers are not submitted. However, to earn Gordon Rule credit, all 8 papers must be written, and I will drop the two lowest scores.

Grades will be based on the rubric at the end of this syllabus.

2. One long paper (see additional Guidelines) @ 3500 words (acceptable range of 3150 to 4200 words) on a topic of your choice (in consultation with the instructor). On October 22, you must submit a Prospectus containing an introduction to the topic, a complete outline, and an annotated bibliography. (Note: The Prospectus does not count towards the 3500 required words.) The paper itself will be due on November 24. I will provide feedback and expectations for the final submission on December 10. Grades will be dropped 10 points for each day late for each portion of the assignment. No portion of the assignment will be accepted more than 5 days late.

You will work on the paper in stages:

- **By September 30th,** you must see me in office hours or by appointment with a brief description of your subject and 3-4 primary and/or secondary sources you plan to use.

- **By noon on October 22nd,** a written prospectus of your subject at least 1000 words or 4 pages long, plus an annotated bibliography consisting of an analysis of at least 6 sources, will be due in my inbox.

- **By noon on November 24th,** the first draft of the paper will be due in my inbox. This will be the primary focus of the assignment.

- You will probably have to revise your paper thoroughly, even to the extent of more or less completely rewriting it. A final version will be due by noon on December 10th. Your grade may subsequently be revised based on the thoroughness and quality of your revisions. If you did not receive the maximum grade of 200 points for the first draft, and you do not revise it for the final version, you will lose 20 points from the grade assigned; that is, if you received an 170 on the draft, your final grade will be a 150.
3. 5E Lesson Plan: In teams of two you will write and demonstrate one 5E Lesson Plan that incorporates significant history of science and/or mathematics content to:

   a. Integrate a historical perspective into a science, math, or technology lesson and/or

   b. Be a history of science or history of math lesson that will either motivate science or math students to understand their subject better, or help to clarify the context or framework of a technique or theory.

Due dates vary based upon when your team is demonstrating your lesson.

4. Two exams, a mid-term and a final exam. There will be no make-up exams, so mark your calendars now. I may, in some instances with solid excuses and proper documentation, administer an exam earlier than the scheduled date at a time convenient to both me and you.

The point distribution is as follows (1000 total)

<table>
<thead>
<tr>
<th>Item</th>
<th>Points</th>
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<tbody>
<tr>
<td>Attendance, participation, and preparation</td>
<td>200 pts</td>
</tr>
<tr>
<td>2 comprehensive exams @ 100 pts each</td>
<td>200 pts</td>
</tr>
<tr>
<td>Short writing assignments, best 6 of 8 @ 20 pts each</td>
<td>120 pts</td>
</tr>
<tr>
<td>Long paper prospectus</td>
<td>50 pts</td>
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<tr>
<td>Long paper</td>
<td>200 pts</td>
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<td>Lesson plan and preparation</td>
<td>180 pts</td>
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<tr>
<td>Lesson plan feedback</td>
<td>50 pts</td>
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<tr>
<td><strong>Total</strong></td>
<td>1000 pts</td>
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Note: To earn Gordon Rule credit, you must earn at least 225 of the 320 (120+200) writing points (70% of the writing points). All 8 short papers must be submitted, but only the best 6 will count towards the required 225 points.

**Accommodations**

Students with disabilities requesting accommodations should first register with the Dean of Students by providing proper documentation. Once registered, students should present their accommodation letter to me supporting a request for accommodations. You are encouraged to initiate these procedures as early as possible in the semester.

*Florida Tech policies on plagiarism and academic dishonesty will be enforced. You will be responsible for being familiar with the Student Rights and Responsibilities.*
Readings
The following textbooks are required, and weekly written assignments will be based upon readings in these books and the supplementary material. I would recommend purchasing your own copies, but I have placed copies of the Gregory and Hatton & Plouffe books on reserve in Library.

   A. Readings from this book will not be directly discussed in most classes. However, various writing assignments will reference specific sections of this book, and you will be expected to demonstrate familiarity of those sections in all assignments from that date forward.

   A. This is a basic textbook loaded with names, dates, accomplishments, ideas, experiments, and other facts and interpretations. It is very complete and well written. Read closely for ideas, facts, and arguments. Keeping up with this reading may prove difficult, but stick with it. Skim if you must, but make sure you are familiar with the ideas and people in each assigned section on the day it is assigned.

   A. This is an excellent anthology of scientists and other authors writing about science and math. It has some history, some philosophy, some ethics, and some wild conjectures. The majority of your short writing assignments and class discussion will come from this volume. Read it carefully and pay attention to the discussion questions. One or two might show up on an exam.

The following book is recommended. It is recommended not because there are no assigned readings from this book, but because it is available in so many other formats than traditional print.


Students should be ready to discuss each reading on the day that it appears on the syllabus. It is also expected that information and insights from the readings will form the core of each week’s writing assignments. All material from the readings can potentially be on the exams.

¹ Any unabridged edition of On the Origin of Species will do, but discussion and potential exam questions will be drawn from this edition.
Using ANGEL (e-Learning)

A good deal of the business of this class will be conducted via the e-Learning system ANGEL. At your first opportunity, please attempt to log-in and familiarize yourself with the features. We will be using the following tools:

- **Syllabus**: This syllabus is already posted on the site. When I update the syllabus, I will change the online version only and send out an announcement. New paper copies will not be handed out unless requested.
- **Announcements**: Announcements to the class, especially those pertaining to use of the e-Learning Site
- **Assignments**: I will post all of your written assignments here. This is where the short essay topics will be posted. You will also use this tool to hand in all assignments and I will return them the same way, with comments and grades. For the first couple of short essays, I want you to also email them to me, just in case this new system does not work out at first. Do not bring paper copies of your assignments to class. We will make other arrangements for your final 5E Lesson Plan packet. It will likely be too complicated to hand in electronically.
- **Calendar**: Deadlines and events in class will appear on the calendar.
- **Chat Room**: I will not be availing myself of the chat room feature for this course, though you are welcome to use it amongst yourselves.
- **Discussions**: I will regularly post discussion topics related to class. Some will pertain directly to specific assignments or classroom topics. You may start your own discussions on pertinent topics, current events, outside readings, or any other topic related to class. This section will be considered an extension of the classroom and will factor in to your Attendance, Participation, and Preparation grade. If you feel you are not participating enough in class, starting a substantive discussion here will certainly help in this regard.
- **Resources**: Here you will find all of the supplemental readings for the class as well as useful web addresses and other things needed for class.

**Note that all discussion throughout the e-Learning site will be monitored and assessed. All standards of decorum, etiquette, collegiality, common sense, and professionalism will apply. If you wouldn’t say it in a classroom, don’t write it here.**
Tentative List of Topics and Readings

Course Orientation

Week One: August 24 & 26
- Tuesday
  - Introduction to Course
- Thursday
  - Historical Perspectives on Science and Math
  - 5E Lesson Plan Assignments
  - Readings
    - How Not to Teach the History of Science by Douglas Allchin

Unit 1 Natural History

Week Two: August 31 - September 2
- Tuesday
  - The Renaissance and Exploration
  - Readings
    - Gregory, Chapter 4 (up to page 80) & 12
    - Frances Bacon's "Of Travel," from The Essays or Counsels, Civil and Moral, of Francis Ld. Verulam Viscount St. Albans.
- Thursday
  - Ordering and Organizing the Natural World
  - Readings
    - Gregory, Chapter 17
    - Equinoctial Regions of America, by Alexander Humboldt.
    - Introduction by Author and Chapter 1 only

Week Three: September 7 & 9
- Tuesday
  - Developing a Theory
  - Readings
    - Hatton and Plouffe Part II
- Thursday
  - Charles Darwin: Voyages and Theories
  - Readings
    - Gregory, Chapter 18
    - Origin of Species, Chapter 1-4

Week Four: September 14 & 16
- Tuesday
  - Aftermath of The Origin
  - Readings
    - Gregory Chapter 19
Unit 2: Analysis

❖ Thursday
  ➢ Contexts of Discovery
  ➢ Introduction to Copernicus and Galileo
  ➢ Reading
    ▪ Hatton and Plouffe Part III
    ▪ Gregory Chapter 4 (starting at page 80) & 5

Week Five: September 21 & 23

❖ Tuesday
  ➢ Copernicus, Galileo, and the Celestial Spheres
  ➢ Readings
    ▪ Gregory, Chapters 6
    ▪ Galileo, Letter to the Grand Duchess Christina of Tuscany
    ▪ Selections from Galileo’s Dialogue Concerning the Two Chief World Systems

❖ Thursday
  ➢ Galileo Continued and Newton
  ➢ Readings
    ▪ Gregory, Chapters 8 & 9
    ▪ Newton’s Rules of Reasoning, Selections from Newton’s Opticks

Week Six: September 28 & 30

❖ Tuesday
  ➢ “The Watershed of the Enlightenment”
  ➢ Reading
    ▪ Gregory Chapters 14 & 15
    ▪ Selections from d’Alembert and Adam Smith

Unit 3: Experiment

❖ Thursday
  ➢ On Scientific Method
  ➢ Making New Effects
  ➢ Readings
    ▪ Hatton and Plouffe, Part I
    ▪ Gregory, Chapter 7 & 11
    ▪ Selections from William Harvey’s De Motu Cordis, Selections from Rene Descartes, Principia Philosophiae, Francis Bacon’s First Book of Aphorisms.

❖ Deadline for discussing paper topic with instructor

Week Seven: October 5 & 7

❖ Tuesday
  ➢ The New Chemistry
Readings
  • Gregory, Chapter 10 & 11

Thursday
  • Getting the Word Out
  • Readings
    • None: Begin studying for Mid-Term

Unit 4: Technoscience
Week Eight: October 12 & 14
  • Tuesday
    • Lecture and Discussion: Global Science
    • Readings
      • Gregory, Chapter 3, Review sections on exploration, natural history, and Darwin
  • Thursday: Mid-Term Exam, Through the end of Unit 3
  • Paper Prospectus Due by Noon October 15

Week Nine: October 19 & 21
  • Tuesday: Lesson Plan 1
  • Thursday
    • Research and Development
    • Big Science and the Atomic Bomb
    • Readings
      • Gregory chapters 25 & 26
      • Selections from: Robert Oppenheimer, The Open Mind
  • Paper Prospectus Due by Noon October 22

Week Ten: October 26 & 28
  • Tuesday
    • Lesson Plan 2
  • Thursday
    • Lesson Plan 3
    • Lecture and Discussion
      • Science and Commerce
    • No outside Readings

Week Eleven: November 2 and 4th
  • Tuesday: Lesson Plan 4
  • Thursday:
    • The Great Robot Race
    • No Class Outside assignment to be discussed later

Week Twelve: November 9 & no class on Nov 11th (Veteran’s Day)
  • Tuesday: Lesson Plan 5
  • Thursday: No Class
Unit 5: World Readings or Hermeneutics

Week Thirteen: November 16 & 18
- Tuesday: Lesson Plan 6
- Thursday:
  - Lesson Plan 7
  - Lecture and Discussion: 17th Century Hermeneutics, Before, and Beyond
  - Gregory, Chapters 1 & 2, and Review chapter 3

Week Fourteen: November 23 and no class on Nov. 25th (Thanksgiving)
- Tuesday:
  - Lesson Plan 8
- Paper Draft Due by noon November 24th
- Thursday: No Class

Week Fifteen: November 30 & December 2
- Tuesday
  - Natural Theology and Ateology
  - Reading
    - William Paley’s Natural Theology, Chapters 1-4 only
- Thursday:
  - Eugenics
  - Final Discussion & Review for Exam
  - Readings
    - Darwin, Chapters 6 & 14

Week Sixteen: December 7
- Final Examination
- Final Draft of Paper Due

Important Dates and Deadlines
- September 30: Deadline for discussing paper topic with instructor
- October 14: Mid-Term Examination
- October 22: Paper Prospectus Due by Noon
- November 24: First Draft of Paper Due by Noon
- December 10: Final Draft of Paper Due by Noon
# Perspectives on Science and Mathematics

## Rubric for Short and Long Papers

Short paper 20 points maximum, as described below. Long paper, points distributed proportionately.

<table>
<thead>
<tr>
<th>Component</th>
<th>Unacceptable 0 Points</th>
<th>Acceptable 2 Point</th>
<th>Good 4 Points</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Argument</strong></td>
<td>① Presentation of opinion or statement without evidentiary or logical support; illogical argument ② No sources referenced ③ Quotations and other sources not cited</td>
<td>• Support by argument and evidence but with weak sources ④ Personal communication or popular sources dominate; variable citation formats</td>
<td>• Clearly sequenced steps leading to clear conclusion, logical argument with authoritative sources ④ Use of secondary and primary sources as appropriate; accessible references; ④ Correct use of appropriate citation style</td>
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<tr>
<td><strong>Clarity of Prose</strong></td>
<td>1. Disjointed or no sentence structure 2. Disorganized paragraphs</td>
<td>5. Sentence structure could improve. ⑤ Paragraphs in need of some editing</td>
<td>I. Sentence structure in need of little or no improvement. ⑤ Paragraph structure clear and in need of little if any improvement</td>
</tr>
<tr>
<td><strong>Structure</strong></td>
<td>④ Unclear thesis statement ⑤ Few organizational cues ⑥ No conclusion or interpretation</td>
<td>⑦ Weak, though present, thesis statement. ⑥ Weak conclusion and/or superficial interpretation.</td>
<td>⑦ A strong, clearly identifiable thesis statement ⑥ Appropriate conclusion and nuanced interpretation.</td>
</tr>
<tr>
<td><strong>Grammar, syntax, spelling, and style</strong></td>
<td>⑦ Several errors in spelling, punctuation, capitalization, or syntax showing carelessness ⑦ Overuse of cliches, idioms and colloquialisms</td>
<td>⑧ A few overlooked errors ⑧ Safe but accurate syntax choices. ⑧ Good use of terms but still lacking fluency</td>
<td>⑧ No errors ⑧ Advanced and nuanced syntax choices. ⑧ Fluency and appropriate use of terms, concepts, historical figures, eras, and practices.</td>
</tr>
<tr>
<td><strong>Improvement over last effort</strong></td>
<td>⑦ Shows little if any consideration of previous edits and comments ⑧ Shows no improvement or growth.</td>
<td>⑧ Remakes some errors, but in lesser numbers. ⑧ Shows clear evidence of incorporating suggestions into writing. ⑧ Shows evidence of improving with practice.</td>
<td>⑧ Remakes few if any past errors. ⑧ Incorporates suggestions and critiques. ⑧ Papers show evidence of growth in sophistication and nuance in writing as well as a growing command of content.</td>
</tr>
</tbody>
</table>
Course Description EDS 4131_Perspectives
This course will explore different ways that scientific investigators have explained the workings of the natural world. This course has four interlocking goals: to give you an overview of the history of science and mathematics for your general education and to broaden your comprehension of the subjects you will be teaching; to enable you to put this broader history and context to work in science and mathematics pedagogy; to improve your writing skills to competence or mastery; and likewise to improve your research and information analysis skills to competence or mastery. This course is designed for students in the FIT4U Teach Program.