SUFFOLK UNIVERSITY
MADRID CAMPUS

SCI 181 M1 - SCIENCE & LIFE IN THE 21ST CENTURY

Instructor Information:
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Course Information:
Catalog Description: This is a four credit, non-lab, science course that examines the central scientific problems confronting the 21st century. The course studies particular topics and teaches the necessary science around these topics to provide a good understanding of the issues. The topics currently are: Energy, Science and Economic Decisions, Sustainability of Life on Earth, Health and Science.
Instructor's Additional Course Description: This course that provide students the opportunity to discuss a variety of scientific subjects relevant to their lives in ths 21st century. It is an interdisciplinary view to applications of sciences in engineering, medicine, climate change, physics and environmental science. Part of the course is carried out through exercies with current scientific news from different journals.
Prerequisites: None
Credit Hours: 4

This course follows the US Federal Government's Credit Hour definition: "An amount of work represented in intended learning outcomes and verified by evidence of student achievement that is an institutional established equivalence that reasonably approximates no less than:

(1) One hour of classroom or direct faculty instruction and a minimum of two hours of out of class student work each week for approximately fifteen weeks for one semester or trimester hour of credit, or ten to twelve weeks for one quarter hour of credit, or the equivalent amount of work over a different amount of time; or
(2) At least an equivalent amount of work as required in paragraph (1) of this definition for other academic activities as established by the institution including laboratory work, internships, practica, studio work, and other academic work leading to the award of credit hours."

For full up-to-date statement:
https://cihe.neasc.org/sites/cihe.neasc.org/files/downloads/POLICIES/Pp111_Policy_On_Credits-And-Degrees.pdf

To complete this course, students will need to dedicate, at a minimum, the following amount of time to the listed activities:

Assignments/Activities	**Engagement Estimate**	**Engagement Hours**
Course readings	Reading text 510 pages x 8 min per page	55
Homework	5 assignments x 2 hours	10
Review lecture notes	2 pages/lecture x 26 lectures x 8 min per page	7
Exam preparation	15 hours x 2	30
Research paper	Reading sources 8 + writing 8	16
Research presentations	Preparing presentation	24
Class Attendance	3 hours x 15 weeks	45
TOTAL		**187 HOURS**

Textbook/Course Materials:

***The Sciences: An Integrated Approach,* 6th ed**. TrefiI, J. & Hazen, R. M. (2007), New York: Wiley

Additional readings: Readings, in addition to the textbook readings, will be provided or indicated from the following sources:

- New Scientist Journal
- Other scientific journals
- Popular science book

These readings are considered mandatory.

Course Goals & Learning Objectives:

Upon successful completion of this course, students will know/understand	**Upon successful completion of this course, students will be able to**	**How the student will be assessed on these learning outcomes:**
• Understand that the STE disciplines involve a manner of inquiry and a process, and are not just content.	• Distinguish between hypothesis-driven and inquiry-based research • Recognize the flexibility of the discovery process and the scientific method • Analyze and solve a problem based upon information from the scientific/technical literature	• Research project. As stated in this syllabus, students must include at least one scientific article in their research project and two others from written sources. • In-class presentation • Class assignments
• Know the skills required to locate and understand scientific/technical literature.	• Locate scientific or technical literature online and/or in the library • Differentiate between factual scientific/technical literature and news/stories/opinions that are intended to persuade or entertain an audience • Locate the definition of unknown vocabulary from a credible source and learn its meaning • Explain an article from the secondary and tertiary scientific/technical literature • Explain scientific/technical ideas in written or oral format	• Research project. The information for this must come from different sources and the students must be able to differentiate them. • In-class presentation and debate. • The exam will contain questions in which it will be necessary to explain their ideas within the scientific format. • Class assignments
• Understand the relationship between natural science and technology, the implications of scientific discoveries, and the potential of the STE disciplines to address problems of the contemporary world.	• Give examples of how the STE disciplines are relevant and applicable to daily life • Recognize that as we gather scientific information, our view of the world changes • Explain how the application of STE disciplines requires ethical considerations and responsibilities • Appreciate that society has a vested interest in STE discoveries	• These criteria must be considered by the students when answering the exam questions, developing their research papers and delivering their in-class presentations.
• Know basic scientific methods, the language and discourse of science, methodologies used to advance science and its applications.	• Use scientific vocabulary and grammar structures related to methodologies and scientific applications.	• Responses to written and oral questions in class • Items on quizzes and exam
• Understand applications and consequences of modern science and technology as described in current articles for non-scientists	• Read current articles written for the non-scientist and be able to summarize them in five sentences	• Written and verbal assignments in which a critical view on the different topics is required. • Items on final exam

Upon successful completion of this course, students will know/understand	Upon successful completion of this course, students will be able to	How the student will be assessed on these learning outcomes:
• Know the necessary communication skills for laymen to discuss scientific material	• Effectively and comfortably participate in scientific or technical discussions	• In-class oral discussions.
• Know methods for doing background research on technology or scientific issues relevant to the 21st century.	• Write scientific papers with brief, concise structure and appropriate vocabulary.	• Present the research to the class in a short, concise and oral presentation.

Course Policies:

Assignments must be delivered on paper. However, when the student is absent at any date in which any work is due, submittal of the assignment via e-mail is accepted if the assignment is received before the end of the class for which it is due.

In the event that a class meeting is unexpectedly cancelled, students will be expected to continue with readings or other assignments as originally scheduled. Any assignments due or class activities (e.g., a quiz, exam or presentation) planned for such a cancelled class are due at the next class meeting unless other instructions are communicated.

**** Email policy: Please note that you must use your Suffolk email account for this course. ****
BlackBoard will not allow the substitution of other email addresses.

Grading/Evaluation:

Attendance will be mandatory and class participation will be encouraged. This course requires participation in discussions, in-class exercises, student presentations and article submittals. Students' active participation is important and constitutes a substantial portion of the attendance grade. Passive attendance, i.e., simply being present in class, will not count as participation, since constructive contribution to discussions, to in-class exercises and to presentations is required.

Grading scale

100% - 93%	A	76% - 73%	C
92% - 90%	A-	72% - 70%	C-
89% - 87%	B+	69% - 67%	D+
86% - 83%	B	66% - 63%	D
82% - 80%	B-	62%-60%	D-
79% - 77%	C+	< 60%	F

These cutoffs can be adjusted (up or down) depending on class average and dispersion.

This course is **not** graded on a curve. However, certain final exam questions will be excluded from grading if less than 25% of the students choose the correct answer.

10%: **Class participation** (attendance, contribution to discussions, in-class exercises, newscientist readings, evaluations of peer presentations)

10%: **Homework** (on-your-own exercises, critical thinking summaries of reading assignments, questions from the text, Internet research)

15%: **Popular science book reading + presentation**

15%: **Presentation + Research paper** (if given on scheduled date)

50%: **Examinations (midterm + final):** required. **I** if excused, **F** for the course if unexcused

Assignments/Exams/Papers/Projects:

Homework Assignments.
Weekly homework will be assigned and most will be due via e-mail prior to noon on the following Thursday unless otherwise directed. Homework will be awarded from 0 to 10 homework points. Late submittals will be penalized.

Research Paper and In-Class Presentation.
The text of the paper must be 6 to 7 pages in length. The recommended presentation is APA, without page numbers in inner citations, 1.5 spaced, Times New Roman 11. However web citations should include date of access and the rest of relevant information. The paper should also include sections an index and page numbers. Diagrams, charts, or pictures should not take up more than the equivalent of 25% of the paper's length and must be clearly relevant and an enhancement of text description of the information. No fewer than 6 references must be utilized and these references must be clearly indicated both in the body of the text and included in a reference list. (The required title page and reference list do not count towards paper length.) **A minimum of one reference must be based on a scientific article and two more from different written sources (newspaper, journal, book, periodical, magazine).** Late submittals will be significantly penalized, and will **not** be accepted after two weeks past the deadline. All students are required to be present during all presentations and to complete a peer evaluation sheet on each presentation. These peer evaluations are an important component of the class participation grade of the student completing them.

Final examination.
The final exam is structured into three parts. All sections are closed book. The first section is voluntary and corresponds to the first mid-term. It allows the student to repeat the mid-term with different questions to improve the grade). The second part will be on the material related to the second part of the course. The third part is extra credit questions on student's presentations.

Course and classroom policies:
- Students are encouraged to participate in class discussions and to ask questions.
- Announcements on possible changes in programming may be made during the semester.
- Useful information for the course may be found on BlackBoard.
- No food or drink (except water) in class is allowed.
- E-mails are answered from Mon 10:00 to Fri 13:00h. No mail will be answered on holidays or during weekends.
- Use of cell phones, laptops and other electronic devices is not allowed. Anyone using or showing them in the classroom will be asked to give it to the professor, who will keep it at the professor´s table until the end of the class session; in cases of repeated disregard of this policy, the professor will ask the student to leave the classroom for the rest of the session.
- The order of the topics on the syllabus, readings and homework assignments is subject to change.
- Students are responsible for all lecture material, handouts and assigned readings.
- Make-up exams are not given. Students who legitimately miss an exam, due to illness, a doctor's visit or family emergency must provide written documentation of the circumstances. Exams that are missed without proper justification result in a grade of F.
- E-mails are answered from Monday 12:00h to Friday a 12:00h.
- During exams it is not allowed to go out of the classroom, so it is recommended to go to the toilet right before exams and to bring water and an extra pen.
- Exams include all the material covered in the classroom.

Participation/Attendance Policy:
The SUMC Student Handbook states the following:

Once a student is registered for a course, attendance at every meeting of every class is expected, including those held in the first week of the semester. A maximum of two unjustified absences is permitted. Each additional absence will cause the final course grade to be lowered by one-third of a letter grade, i.e., from A to A-; A- to B+; B+ to B, etc.

Excessive absences in a course will have a negative effect on the final grade. When a student is absent, the quality of his or her work in a course will deteriorate since material missed in class sessions can rarely be made up satisfactorily, even though the student remains responsible for that work.

Please note that even when a student has a justified reason for missing class, such as illness, the negative academic impact on learning will be the same as if the absence were for spurious reasons.

In this course, any absence due to illness should be justified by a note from the student's physician or other health professional confirming the day(s) on which the student was unable to attend class. A written excuse from a student's host parent or residence supervisor is also acceptable.

In the event that a class meeting is unexpectedly cancelled, students will be expected to continue with readings or other assignments as originally scheduled. Any assignments due or class activities (e.g., a quiz, exam or presentation) planned for such a cancelled class are due at the next class meeting unless other instructions are communicated.

Disability Statement:
If you anticipate issues related to the format or requirements of this course, please meet with me. I would like us to discuss ways to ensure your full participation in my classroom.

If formal, disability-related accommodations are necessary, it is very important that you be registered with the Office of Disability Services (ODS) at the main Campus in Boston so that I am notified of your eligibility for reasonable accommodations. We can then plan how best to coordinate your accommodations. Check the ODS web site at www.suffolk.edu/disability for information on accommodations.

Student Resources:
SUMC provides a range of student services, both academic and personal. To learn more about course-related tutorials and academic workshops, refer to the SUMC Student Handbook, Section 2 "Academic Policies and Services". Section 5, "Living in Madrid", contains information on the medical and mental health resources, including an English-speaking therapist, available to you.

Midterm Review:
At midterm, around week 6, you will be given a midterm grade based on your progress to date and performance on assignments, quizzes and midterm exam. Midterm grades of C- or below will be reported to the Madrid Campus Academic Standing Committee, with an explanation of what I believe has contributed to that grade: excessive absences, poor time management or study skills, lack of effort, difficulty with the course material or with writing or language skills, etc. The Academic Standing Committee or I may contact you to suggest strategies for addressing these difficulties. I strongly encourage you to visit me during my office hours so we may discuss how you can be successful in this class.

Academic Misconduct:
www.suffolk.edu/about/mission-history/policies-procedures/academic-misconduct-policy
Suffolk University expects all students to be responsible individuals with high standards of conduct. Students are expected to practice ethical behavior in all learning environments and scenarios, including classrooms and laboratories, internships and practica, and study groups and academic teams. Cheating,

plagiarism, unauthorized collaboration, use of unauthorized electronic devices, self-plagiarism, fabrication or falsification of data, and other types of academic misconduct are treated as serious offenses that initiate a formal process of inquiry, one that may lead to disciplinary sanctions.

Student work will be thoroughly examined for academic integrity and may be scanned using plagiarism detection software. A faculty member suspecting academic misconduct will contact the student using the Suffolk email address to schedule a meeting and will make all effort to do so within five business days of detecting the incident. During the meeting, the faculty member will present the documentation that led to suspected academic misconduct. Resolution of the incident will be according to the procedures outlined in the SUMC Student Handbook.

Academic Grievances Policy:
www.suffolk.edu/student-life/student-services/student-handbook/university-policies-for-student-cas-sbs/grievances-academics

Course Schedule:
The schedule, policies, procedures, and assignments in this course are subject to change in the event of extenuating circumstances, by mutual agreement, and/or to ensure better student learning.

Week	General topic of lesson	Readings or other assignments due
1	Introduction to course procedures How does science work?	• Q and A session on the article. • "What Is Science?" • Posted on BlackBoard • Finding Scientific news
1	The World of Science	• Find the latest scientific news on NS • Rosling video • Video: How not to be ignorant.
2	The Universe: From the Big Bang to the Atom	• Find the latest scientific news on NS • Read the article 100 billion billion Earths and other articles
3	Solar System and the Origin of Planet Earth	• Earth Catastrophe´s • Earth formation and Snowball Earth • Provide the first ideas on your Popular Science Book reads
4	Earth's many cycles: New perspectives in climate change	• Video: "The Cloud Mystery" • Recent scientific news: students will research a topic (NS) related to climate change and its implications for the 21st century and explain it in the classroom.
5	Renewable energy and the future Book Reading Presentations	• Watch videos on 1. Hedonistic Sustainability. 2. Energy from algae. 3. The transition to a world without oil. 4. Energy new ideas. • Critical analyses • Book Reading Presentations • NS News on Renewables
6	Midterm preparation MIDTERM EXAM	• Preparation for the Midterm
7	Nature design and conservation Case study	• Videos: Nature Design • Rewilding • The Science behind Lion Conservation in Africa • Students must look for examples of biomimicry and nature design and explain them. • Homework: Present news from NS Journal (provided)

Week	General topic of lesson	Readings or other assignments due
8	The human brain and how breakthroughs in psychology are changing the world	• Video: "What Is So Special About the Human Brain?" • Read one out of the 14 suggested articles; explain it to the class and lead discussion on it.
9	Evolution I: New perspectives in the history of Planet Earth	• Video "De-extinction: Bringing Extinct Species Back to Life
10	Evolution II: New perspectives in the history of Human Evolution	• Humans as runners
11	Student presentations and debate	• Based on the personal research paper
12	States of energy and physics	• Present latest scientific news. • Article "What Would a World Without Fossil Fuels Look Like?" • Understanding physical forces with • "The Science of Stupid" videos
13	Health, genetics and biotechnology	• Watch video: "Eat to Starve Cancer" • Students will engage in a personal research to learn about the scientific bases and the economic and societal implications of diseases currently in the news and of other health issues.
14	Chemistry and new materials. Case study: graphene. Computers, nanotechnology and bionic hands	• Read and extract the main critical points from the interview with Adah Almutairi on "activated nanoballs" • Reading about graphene
15	Preparation for the final exam FINAL EXAM	