IDNS - 4392 - History of 20th Century Science

3e. UH Core - Revising Existing Course to add to Core or Revise Existing Core Course and remain in Core (UGRD only)

1. Course Ownership/Implementation/Justification

Department* **Natural Sciences and Mathematics**

Required Approval Steps*
- [ ] Undergraduate Studies Department Committee Review
- [ ] Undergraduate Studies Department Chair/Program Director
- [x] Undergraduate Studies College Curriculum Committee

Will the course be cross-listed with another area?*
- ( ) Yes
- (•) No

If yes, has an agreement with department(s) been reached?
- ( ) Yes
- (•) No

Department(s) and Course(s) that will be cross-listed with this course

Catalog year of implementation*
- (•) 2016 - 2017
- ( ) 2017 - 2018

Justification(s) for Adding/Revising Course for Core* **1. REVISE EXISTING non-CORE COURSE ADD TO CORE**

Term(s) Course will be TYPICALLY Offered:*
- [ ] Fall (including all sessions within term)
- [ ] Spring (including Winter Mini all sessions within term
- [ ] Summer (including Summer Mini and all sessions within term)
- [x] Contact Your Academic Advisor

State the rationale

for creating this new Core course or revising the existing Core course:*	Course was previously core, but paperwork was never submitted to add to the new core.

Justification - if "other" selected above:	Course was previously core, but paperwork was never submitted to add to the new core.

2. Course Catalog Information

Instructional Area/Course Prefix*	IDNS
Course Number*	4392
Long Course Title*	History of 20th Century Science
Short Course Title (30 character limit)*	History of 20th Cent. Science
Instruction Type*	**Lecture ONLY**
Lecture*	3
Lab*	0
Course Credit Level*	**Senior**
Grade Option*	**Letter (A, B, C.....)**

Can this course be repeated for credit?*	○ Yes ◉ No
If Yes, how often and/or under what conditions may the course be repeated?	
Maximum number of credit hours required of this course in degree plan*	**3.0**
Number of course completions (attempts) allowed*	**3**
Are multiple enrollments allowed for course within a session or term?*	○ Yes ◉ No
CIP Code*	54 .0104 .00
Requisite Checks in PeopleSoft (functionality within PeopleSoft)*	○ Need to adjust requisite checks already in place - Begin enforcement Fall ○ Need to adjust requisite checks already in place - Begin enforcement Spring ○ Need to create requisite checks for course - Begin enforcement Fall ○ Need to create requisite checks for course - Begin enforcement Spring ○ No adjustment required - requisites not being changed ◉ No requisite check desired for course at this time
Prerequisite(s):*	ENGL 1304 and credit for or enrollment in 12 hours of natural science courses.
Corequisite(s)	

Course Description* Analyzes central issues in the evolution of science during the past century.

Course Notes

3. Authorized Degree Program(s)/Impact Study

Is this a required course for any program (degree, certificate, or minor)?* ○ Yes - enter additional information in field below ◉ No

If yes, for which program(s)?

Does this change cause a change in any program?*

- ○ Yes - attach copy of program plan
- ◉ No

If yes, to which program(s)?

Does this change force changes in prerequisites for other courses?*

- ○ Yes - enter additional information in field below
- ◉ No

If yes, which course(s) and is a proposal being submitted to reflect the change?

Impact Report*

Impact Report for IDNS 4392

There are no results for this report.

4. Core Curriculum Information

Learning Outcomes*	*State key historical facts that shaped natural sciences in 20th century America *Analyze the interaction between natural sciences and society in 20th Cent. America *Compose reports and essays on the evolution of natural science disciplines
Foundational Component Area for which the course is being proposed (select one)*	**Life & Physical Sciences**
Component Area Option (optional)	**Component Area Option (b): Writing in the Disciplines**
Competency areas addressed by the course*	**Communication Skills** **Critical Thinking** **Personal Responsibility** **Social Responsibility** **Teamwork**
Critical Thinking, if applicable	

	Analyze, evaluate, and synthesize information about the evolution of natural sciences: a) Orally, by articulating arguments in structured in-class discussions b) In writing, by abstracting information in response statements (five short documents - one page each) c) In writing, by composing theses in essays (two long documents - 12 pages each)
Communication Skills, if applicable	Expressing information and ideas about the evolution of natural sciences: a) Orally, by using the right words to convince class participants about the legitimacy of their thesis b) In writing, by using elegant prose to make their point across
Empirical & Quantitative Skills, if applicable	
Teamwork, if applicable	Learning to interact and work with students from other science disciplines in structured in-class discussions.
Social	

Responsibility, if applicable	In one of the one page papers, students will demonstrate Social Responsibility
Personal Responsibility, if applicable	In one of the one-page papers, students will demonstrate Personal Responsibility
Will the syllabus vary across multiple section of the course?*	○ Yes ◉ No
If yes, list the assignments that will be constant across sections	

5. Supporting Documentation

Type of Attachments*	☑ Course Syllabus ☐ Degree Plan ☐ Memo ☑ Other Document(s)

"Other" documents:	Old CBM form Old Request for Courses in the Core Curriculum

6. Additional Information Regarding This Proposal

Contact person for questions about proposal:*	***Other, not listed**
Comments:	Ioanna Semendeferi- 713.743.3544/ isenendeferu@uh.edu **Question 4b should be "Component Area Option" as it is on the old Request For Course in The Core Form, but this choice is not available. Life Science was selected to initiate the form. When question 4b is corrected then it needs to reflect Component Area Option to reflect 4c- WID.

Administrative Use Only

(Administrative Use Only) Proposal ID#	
Original Course Prefix	IDNS
Original Course Code	4392
Original Course Title	History of 20th Century Science
Original Course OID	25644

IDNS 4392 (17125)
IDNS 6392 (17126)

Syllabus

History of 20th Century Science: Science and Society/Culture in 20th Century America

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Spring 2015: MW, 4-5.30 pm, Classroom: 315 Health and Biomedical Sciences Center (HBSC)

Instructor: Ioanna Semendeferi **E-Mail:** isemendeferi@uh.edu
Office Hours: By appointment **Office:** 338 Health and Biomedical Sciences Center (HBSC)
Office Phone: (713) 743-3544

Description

After introducing the students to the basic principles and styles of writing, the course emphasizes practice on topics drawn from the science history record. The topics are diverse covering a wide range of disciplines keeping the course engaging and accessible across departmental boundaries. In our team-science era, the value of such course cannot be overestimated: Learning to interact and work in inter- and multi-disciplinary settings is a must for science students. Furthermore, the best way for students to improve their writing skills is by practicing them. Reading and guided discussion also help the students to articulate thoughts and arguments in a science context before they put them on paper. This is a fundamental process: In order to write effectively, first the student has to formulate a clear concept in her/his mind, and this is perhaps the most difficult part. More important, historical knowledge should be a must in science education: There is no way to build a better future without drawing wisdom from the past [see "Together We Stand," *Nature Physics* 10:10 (2014), 700-702].

Specifically, the course analyzes central issues in the evolution of science and technology during the past century. Emphasis is placed on the interaction between science, technology, and society/culture in America. How did science change from "little science" to "BIG SCIENCE"? How did "pure science" and "simple collaboration" become "entrepreneurial" and "teamwork science"? How did industrial labs replace independent inventors? What were the transformations that science and technology underwent during the Great Depression and the two World Wars? Why did scientists and engineers end up pursuing research on weapons of mass destruction? How did the Vietnam War and the American counterculture of the 1960s affect the evolution of science and technology? How did the Cold War shape and in turn was shaped by the development of science and technology?

This course addresses some of the above questions and attempts to enrich the understanding of how society/culture in America influenced and in turn was influenced by the development of science and technology in the twentieth century. In particular, this course focuses on the following themes: The enormous influence of scientific experts in the progressive era of the early twentieth century; conservation versus preservation and the emergence of ecology; the basis and social goals of the eugenics movement; the development and use of genetics by scientists and politicians; the Manhattan Project and the dropping of the atomic bombs at Hiroshima and Nagasaki; the decision to build the Super bomb; nuclear fear,

environmental science and the challenge of environmentalism; the American technological revolution; global concerns, NASA and the Space Program.

Requirements: The course is mainly a reading and writing course. There will be lectures and presentation of documentary films. However, the focus of the course will be the students' participation: Discussion of the assigned readings, completion of five response statements (one page each), and the development of two essays (12-15 pages each). Please, keep up with the readings and try not to fall behind at any time. Plan in advance to avoid surprises. Remember, the main requirement of the course is reading, writing, and thinking critically. There will be a Tutorial devoted to writing principles and styles across disciplines.

Discussion: For *every* topic, there will be classes exclusively devoted to discussion (please see specifics in the Course Outline section below). The discussion will take place between individual students or groups of students and the instructor will act as the moderator. Thus, students should be prepared to talk *in every discussion class*: They should read carefully the assigned material (book chapters, articles) and bring comments and issues for discussion at each class.

Response Statements (one page each): For five out of the six course topics, students will provide the instructor with a "Response Statement" on the particular topic (please see the specifics in the Course Outline section below). In this statement, the student should respond to the readings. That is, he/she should analyze the author's thesis/evidence and present his/her interpretation of the issues.

Exams (12-15 pages each): There will be one midterm and one final take-home essay (please see specifics in the Course Outline section below).

Grading: Discussion: 30%
Response Statements: 20%
Midterm take-home essay: 25%
Final take-home essay: 25%.

Prerequisite: a) ENGL 1304 and credit for or enrollment in 12 hours of natural science courses OR b) Graduate standing and credit for or registration in 12 hours of natural science courses OR c) Instructor's approval.

Maximum number of students: 20 students

Recommended Approach: In the discussions and in the writings the student should try to develop thoughtful arguments and comments. He/she should avoid presenting a simple summary of case facts. The goal is to *analyze* the issues involved in each topic. Remember: Your focus should be on the interaction between science and society/culture. Based on historical evidence, how does science shape society/culture and how, in turn, society/culture shapes science?

Course Readings: The only book that students would need to buy is: Wayne G. Booth, Gregory G. Colomb, and Joseph M. Williams, *The Craft of Research* (Chicago: The University of Chicago Press, 2008). Multiple paperback copies of all the other required books are placed on

Library Reserve (UH M.D. Anderson Library). Any additional required readings are available through Blackboard.

Course Outline

TOPIC 1: Ecology and Environmental Concerns

W, Jan 21 - WELCOME & LECTURE
M, Jan 26 - FILM(S): "Dear Scientists" & "Silent Spring"
W, Jan 28 - DISCUSSION: Young's Reading: Preface-Ch. 4 (pp. ix-113)
M, Feb 2 - LECTURE
W, Feb 4 - FILM(S): "Meltdown at Three Mile Island" & "Three Mile Island Revisited"
M, Feb 9 – DISCUSSION & DUE RESPONSE STATEMENT on TOPIC 1:
Young's Reading: Chapter 5-Epilogue (pp. 115-214) and
Wang's Reading: pp. 190-193

REQUIRED READINGS:
[1] Christian C. Young, *The Environment and Science: Social Impact and Interaction* (Santa Barbara, CA: ABC-CLIO, Inc., 2005) (Library Reserve)
[2] Jessica Wang, "Ethics and Social Responsibility in Science," in Marc Rothenberg (ed.), *The History of Science in the United States: An Encyclopedia* (New York: Garland Publishing Inc., 2001) (Blackboard Learn)

RECOMMENDED READINGS:
[1] Naomi Oreskes and Eric M. Conway, *Merchants of Doubt: How a Handful of Scientists Obscured the Truth on Issues from Tobacco to Global Warming* (New York: Bloomsbury Press, 2010) (Available through www.amazon.com)

TOPIC 2: TUTORIAL: Writing Principles and Styles across Disciplines

W, Feb 11 - LECTURE

REQUIRED READINGS:
[1] Wayne G. Booth, Gregory G. Colomb, and Joseph M. Williams, *The Craft of Research* (Chicago: The University of Chicago Press, 2008) (To Buy)

TOPIC 3: The Atomic Age

M, Feb 16 - LECTURE
W, Feb 18 - FILM(S): "The Day after Trinity"
M, Feb 23 - DISCUSSION: Badash's Reading: Introduction-Ch. 6 (pp. 1-114)
W, Feb 25 - LECTURE
M, Mar 2 - FILM(S): "The Atomic Cafe"
W, Mar 4 – DISCUSSION & DUE RESPONSE STATEMENT on TOPIC 3:
Winkler's Reading: Prologue-Epilogue (pp. 3-214)

REQUIRED READINGS:
[3] Lawrence Badash, *Science and the Development of Nuclear Weapons: From Fission to the Limited Test Ban Treaty, 1939-1963* (Atlantic Highlands, NJ: Humanities Press

International Inc., 1998) (Library Reserve)
[4] Allan M. Winkler, *Life Under a Cloud: American Anxiety About the Atom* (Urbana, IL: University of Illinois Press, 1999) (Library Reserve)

TOPIC 4: Eugenics and Genetics

M, Mar 9 – LECTURE / DUE MIDTERM EXAM (Take-Home Essay)
W, Mar 11 - FILM(S): "Tomorrow's Children"
M, Mar 16 – HOLIDAY/NO CLASS
W, Mar 18 – HOLIDAY/NO CLASS
M, Mar 23 - DISCUSSION: Paul's Reading: Ch. 1-Ch. 7 (pp. 1-135) and
Kevles' Reading: Ch. 1-Ch. Ch.6 (pp. 3-95)
W, Mar 25 - LECTURE
M, Mar 30 - FILM(S): "In the Shadow of the Reich: Nazi Medicine"
W, Apr 1 – DISCUSSION & DUE RESPONSE STATEMENT on TOPIC 4:
Kevles' Reading: Ch. 7-Ch. 19 (pp. 96-301)

REQUIRED READINGS:
[5] Diane B. Paul, *Controlling Human Heredity: 1865 to the Present* (Atlantic Highlands, NJ: Humanities Press International, Inc., 1999) (Library Reserve)
[6] Daniel J. Kevles, *In the Name of Eugenics: Genetics and the Uses of Human Heredity* (Cambridge, Mass.: Harvard University Press, 1998) (Library Reserve)

TOPIC 5: Technological Dreams and Realities

M, Apr 6 - LECTURE
W, Apr 8 - FILM(S): "The World of Tomorrow"
M, Apr 13 - DISCUSSION: Hughes's Reading: Introduction-Ch. 6 (pp. 1-294)
W, Apr 15 - LECTURE
M, Apr 20 – DISCUSSION & DUE RESPONSE STATEMENT on TOPIC 5:
Hughes's Reading: Ch. 6-Ch. 9 (pp. 295-472)

REQUIRED READINGS:
[7] Thomas P. Hughes, *American Genesis: A Century of Invention and Technological Enthusiasm, 1870-1970* (Chicago: The University of Chicago Press, 2004) (Library Reserve)

TOPIC 6: Space Science and Global Sensibilities

W, Apr 22 - LECTURE
M, Apr 27 - DISCUSSION: McCurdy's Reading: Introduction-Ch. 3 (pp. 1-89)
W, April 29 - FILM(S): "Challenger: The Untold Story"
M, May 4 – DISCUSSION & DUE RESPONSE STATEMENT on TOPIC 6:
McCurdy's Reading: Ch. 4-Conclusion (pp. 90-174) and
Vaughan's Reading: Ch. 1 (pp. 1-32)

REQUIRED READINGS:
[8] Howard E. McCurdy, *Inside NASA: High Technology and Organizational Change in the U.S. Space Program* (Baltimore: John Hopkins University Press, 1994) (Library Reserve)
[9] Diane Vaughan, *The Challenger Launch Decision: Risky Technology, Culture, and Deviance at NASA* (Chicago: University of Chicago Press, 1997): Ch. 1 (pp. 1-32) (Blackboard Learn)

M**,** May 11: FILM: "Into Eternity" / DUE FINAL EXAM (Take-Home Essay)

REQUEST FOR COURSES IN THE CORE CURRICULUM

Originating Department or College: NSM

Person Making Request: Ioanna Semendeferi Telephone: 713-743-3544

Email: isemendeferi@uh.edu

Dean's Signature: _____ Date: 06-02-15

Course Number and Title: IDNS 4392 History of 20th Century Science

Please attach in separate documents:

- [X] Completed CBM003 Add/Change Form with Catalog Description
- [X] Syllabus

List the student learning outcomes for the course:

***State key historical facts that shaped natural sciences in 20th century America**

***Analyze the interaction between natural sciences and society in 20th Cent. America**

***Compose reports and essays on the evolution of natural science disciplines**

Component Area for which the course is being proposed (check one):

- [ ] Communication
- [ ] Mathematics
- [ ] Language, Philosophy & Culture
- [ ] Creative Arts
- [ ] American History
- [ ] Government/Political Science
- [ ] Social & Behavioral Science
- [X] Component Area Option

Component Area	Critical Thinking	Communication Skills	Empirical & Quantitative	Teamwork	Social Responsibility	Personal Responsibility
Communication (6)	√	√			√	√
Mathematics (3)	√	√	√			
Life and Physical Sciences (6)	√	√	√	√		
Language, Philosophy, and Culture (3)	√	√		TW or PR	√	TW or PR
Creative Arts (3)	√	√		√	√	
American History (6)	√	√			√	√
Government/ Political Science (6)	√	√		√	√	√
Social/Behavioral Science (3)	√	√	√		√	√
Component Area Option (6)						
WID (3)	√	√		(select at least one more core objective)		
Math Reasoning (3)	√	√		(select at least one more core objective)		

Competency areas addressed by the course (refer to chart above for competencies that are required and optional in each component area):

- [X] Critical Thinking
- [X] Communication Skills
- [ ] Empirical & Quantitative Skills
- [X] Teamwork
- [X] Social Responsibility
- [X] Personal Responsibility

Because we will be assessing student learning outcomes across multiple core courses, assessments assigned in your course must be considered for viability in the general education assessment. For each competency checked above, indicate the specific course assignment which, when completed by students, will provide evidence of the competency. Provide detailed information, such as copies of the paper or project assignment, copies of individual test items, etc.

Critical Thinking

Analyze, evaluate, and synthesize information about the evolution of natural sciences:
a) Orally, by articulating arguments in structured in-class discussions
b) In writing, by abstracting information in response statements (five short documents - one page each)
c) In writing, by composing theses in essays (two long documents - 12 pages each)

Communication Skills

Expressing information and ideas about the evolution of natural sciences:
a) Orally, by using the right words to convince class participants about the legitimacy of their thesis
b) In writing, by using elegant prose to make their point across

Empirical & Quantitative Skills

Teamwork

Learning to interact and work with students from other science disciplines in structured in-class discussions.

Social Responsibility

Through the lectures, documentary films, and structured in-class discussions, the students:
a) Become aware of the social dimensions and implications of natural sciences
b) Understand their civic responsibility as future practitioners of science

Personal Responsibility

Experiencing peer pressure during the structured in-class discussions, has an orthotic effect on students' sense of responsibility towards the class.

Inclusion in the core is contingent upon the course being offered and taught at least once every other academic year. Courses will be reviewed for renewal every 5 years.

The department understands that instructors will be expected to provide student work and to participate in university-wide assessments of student work. This could include, but may not be limited to, designing instruments such as rubrics, and scoring work by students in this or other courses. In addition, instructors of core courses may be asked to include brief assessment activities in their courses.

Dept. Signature:_____