

**CALIFORNIA STATE UNIVERSITY CHANNEL ISLANDS
NEW COURSE PROPOSAL**

DATE 12.18.06
PROGRAM AREA CHEMISTRY & HISTORY

1. Catalog Description of the Course. *[Follow accepted catalog format.]*

Prefix CHEM Course# 330 Title THE HISTORY OF SCIENCE: NONWESTERN ORIGINS AND THE WESTERN REVOLUTION Units (3)

3 hours lecture per week
hours per week

- Prerequisites none
 Corequisites none

Description
CHEM 330

A survey of scientific history from 2000 BCE to the present that considers science as a set of made, lost and found ideas and technologies. Fields of inquiry are examined by tracing their historical and cultural trajectories through the African, Arab, Babylonian, Chinese, Egyptian, Greek, Indian, Incan, Japanese, Mayan and Sumerian worlds.

HIST 330

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|--|--|---|
| <input checked="" type="checkbox"/> Gen Ed | Graded
<input type="checkbox"/> CR/NC | <input type="checkbox"/> Repeatable for up to _____ units |
| Categories B,,UDIGE | <input checked="" type="checkbox"/> A - F | Total Completions Allowed |
| <input type="checkbox"/> Lab Fee Required | <input type="checkbox"/> Optional (Student's choice) | <input type="checkbox"/> Multiple Enrollment in same semester |

2. Mode of Instruction.

	Units	Hours per Unit	Benchmark Enrollment	Graded Component	CS # (filled in by Dean)
Lecture	3	1	25	<input checked="" type="checkbox"/>	_____
Seminar	_____	_____	_____	<input type="checkbox"/>	_____
Laboratory	_____	_____	_____	<input type="checkbox"/>	_____
Activity	_____	_____	_____	<input type="checkbox"/>	_____

3. Justification and Learning Objectives for the Course. (Indicate whether required or elective, and whether it meets University Writing, and/or Language requirements) *[Use as much space as necessary]*

Justification:

CHEM/HIST330 is an elective cross listed between the Chemistry and History programs. It is not required by either major. CHEM/HIST 330 presents a historical overview of all the basic fields of the physical sciences, using Chemistry to link these diverse disciplines. Since CHEM/HIST 330 challenges current notions of Science's Western origins, it provides a fundamentally multicultural experience.

Learning Objectives:

Students will leave the course able to understand and communicate in both written and oral fashion:

1. the overall timeline of scientific development from ~2000B.C. to the present.
2. the linkages between non-European science and Western technological development.
3. the historical and intellectual interdependencies of the major scientific disciplines.
4. the differences between various scientific methods and technologies, and the cultural origins of these differences.

- 4. Is this a General Education Course** YES NO
If Yes, indicate GE category and attach GE Criteria Form:

- A (English Language, Communication, Critical Thinking)**
- A-1 Oral Communication
- A-2 English Writing
- A-3 Critical Thinking
- B (Mathematics, Sciences & Technology)**
- B-1 Physical Sciences
- B-2 Life Sciences – Biology
- B-3 Mathematics – Mathematics and Applications
- B-4 Computers and Information Technology
- C (Fine Arts, Literature, Languages & Cultures)**
- C-1 Art
- C-2 Literature Courses
- C-3a Language
- C-3b Multicultural
- D (Social Perspectives)**
- E (Human Psychological and Physiological Perspectives)**
- UD Interdisciplinary**

5. Course Content in Outline Form. *[Be as brief as possible, but use as much space as necessary]*

CHEM/HIST 330 will be lecture-, discussion- and writing-based. Students will be required to actively participate in classroom activities, with a portion of each week dedicated to student-driven seminar-style exploration of the readings and lecture material. Assignments will include weekly readings, two exams and a written research report; assessment will be based on how well each of these reflects the Learning Objectives.

1. Definitions of science and technology and overview of world cultures
2. Mathematics: zero, fractions, positional notation, geometry, algebra and calculus
3. Astronomy/Cosmology: constellations, eclipses, comets, observatories and the heliocentric solar system
4. Physics: uncuttable particles, vacuum, waves, optics and gravity
5. Geology: mineralogy and tools, mining, seismography, fossils, plate tectonics, and the age of the earth
6. Chemistry: food, dyes, medicine, transmutation, distillation, gases and the elements
7. Biology: ethnobotany, dissection, categorization and genes
8. Notions of Power: dominance of science & technology in western culture

Does this course overlap a course offered in your academic program? YES NO

If YES, what course(s) and provide a justification of the overlap?

Does this course overlap a course offered in another academic area? YES NO

If YES, what course(s) and provide a justification of the overlap?

Signature of Academic Chair(s) of the other academic area(s) is required on the signature sheet below.

6. Cross-listed Courses (Please fill out separate form for each PREFIX)

List Cross-listed Courses

HIST 330

Signature of Academic Chair(s) of the other academic area(s) is required on the signature sheet below.

Department responsible for staffing: Chemistry

7. References. *[Provide 3 - 5 references on which this course is based and/or support it.]*

1. Lost Discoveries, Derek Teresi, Simon & Schuster, 2002.
2. The Crest of the Peacock: Non-European Roots of Mathematics, George G. Joseph, Penguin, 1992.
3. The Structure of Scientific Revolution, Thomas Kuhn, University of Chicago Press, 1962.
4. UC Berkeley, Department of History, #30A The History of Premodern Science. Susan Groppi, Instructor, 2006.

8. List Faculty Qualified to Teach This Course.

9. Frequency.

a. Projected semesters to be offered: Fall Spring Summer

10. New Resources Required. YES NO

If YES, list the resources needed and obtain signatures from the appropriate programs/units on the sheet below.

a. Computer (data processing), audio visual, broadcasting needs, other equipment)

b. Library needs

c. Facility/space needs
3 units lecture hall

11. Will this new course alter any degree, credential, certificate, or minor in your program? YES NO

If, YES attach a program modification form for all programs affected.

Blake Gillespie
Proposer of Course

10/10/2006
Date

Request for GE Approval

Course Title	CHEM 330 The History of Science: Nonwestern Origins and the Western Revolution
Units	3
Lab	No
New	Yes

GE Category	B1 Physical Sciences -- Chemistry, Physics, Geology, and Earth Sciences
Submitter	Gillespie, David
Submission Date	10-10-2006
Status	Approved

Criteria Justifications

- Promote the understanding and appreciation of the methodologies of math or science as investigative tools and the limitations of mathematical or scientific endeavors

CHEM 330 explores a wide variety of methodologies from several scientific traditions. Within the context of many, the limitations and strengths of each are more easily apprehended. The evolution of the tools available to investigators over the centuries are discussed, as are the way that these technologies opened or closed various lines of inquiry in different societies.

- Present mathematical or scientific knowledge in a historical perspective and the influences of math or science on the development of world civilizations, both past and present

Placing math and science in a historical perspective is central to CHEM 330. By giving an overview of many cultures and fields, the course gives students the very broadest perspective. The role of the sciences in social growth is examined, as well as the role of the society or culture in determining the means by which knowledge is gathered. This survey allows the students to view the state of current science and its impact on society through the lens of past science.

- Apply inductive and deductive reasoning processes and explore fallacies and misconceptions in the mathematical or scientific areas

CHEM 330 examines a variety of knowledge-building methods, and through comparison reveals strengths and weaknesses in each. For example, students explore the differences between the 'pure,' inductive reasoning of ancient Greek geometry and the more empirically-driven mathematics of the Egyptians of the same period. Examining the boundaries imposed on ancient scientists by their

methods and cultures reveals the limitations inherent in modern science, as well.

- Present the principles and concepts of the physical sciences and the physical universe

CHEM 330 presents the fundamental concepts of the various physical science disciplines in a systematic fashion. Students break the history of science down field-by-field, but also tie these fields together by seeking patterns in societies' spiritual, political and material needs that have always driven scientific progress.

GE Category UDIGE Upper Division Interdisciplinary
GE

Status Approved

Criteria Justifications

- Emphasize interdisciplinarity by integrating content, ideas, and approaches from two or more disciplines

This class is cross-listed between Chemistry and History, and integrates the scientific knowledge gained over thousands of years with the historical perspectives required to understand the importance of context and circumstance in 'progress.' Furthermore, several individual physical science disciplines are linked together by common historical trajectories; CHEM 330 strives to concentrate all these fields into a single tool for understanding the role of Science in societies.

- Include substantive written work consisting of in-class writing as well as outside class writing of revised prose. Examples of appropriate written work include: short papers, long papers, term papers, lab reports, documentation, disciplinary-based letters and memos, and essays.

CHEM 330 requires students to complete multiple essay-based in-class exams and to complete iteratively-edited research papers.

Approval Sheet

Program/Course: Chemistry/CHEM 330

Program Chair(s)

Date

General Education Chair(s)

Date

Curriculum Committee Chair(s)

Date

Dean of Faculty

Date