

# CHEM 267: BIOCHEMISTRY OF AGING

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## In Workflow

1. CHEM Committee Chair (robertslm@csus.edu)
2. CHEM Chair (crawford@csus.edu)
3. NSM College Committee Chair (tsk@csus.edu)
4. NSM Dean (datwyler@csus.edu)
5. Academic Services (curriculum@csus.edu)
6. Senate Curriculum Subcommittee Chair (curriculum@csus.edu)
7. Dean of Undergraduate (gardner@csus.edu)
8. Dean of Graduate (cnewsome@skymail.csus.edu)
9. Catalog Editor (catalog@csus.edu)
10. Registrar's Office (k.mcfarland@csus.edu)
11. PeopleSoft (PeopleSoft@csus.edu)

## Approval Path

1. Thu, 02 Mar 2023 23:23:41 GMT  
Linda Roberts (robertslm): Approved for CHEM Committee Chair
2. Mon, 13 Mar 2023 23:59:18 GMT  
Susan Crawford (crawford): Approved for CHEM Chair
3. Thu, 16 Mar 2023 01:20:05 GMT  
Thomas Krabacher (tsk): Rollback to CHEM Chair for NSM College Committee Chair
4. Thu, 16 Mar 2023 22:44:48 GMT  
Susan Crawford (crawford): Approved for CHEM Chair
5. Thu, 16 Mar 2023 22:57:33 GMT  
Thomas Krabacher (tsk): Approved for NSM College Committee Chair
6. Thu, 16 Mar 2023 23:03:16 GMT  
Shannon Datwyler (datwyler): Approved for NSM Dean

## New Course Proposal

Date Submitted: Fri, 18 Nov 2022 20:27:20 GMT

**Viewing: CHEM 267 : Biochemistry of Aging**

**Last edit: Thu, 16 Mar 2023 22:44:40 GMT**

Changes proposed by: Johannes Bauer (223000388)

**Contact(s):**

Name (First Last)	Email	Phone 999-999-9999
Johannes Bauer	j.bauer@csus.edu	916.278.4635

**Catalog Title:**

Biochemistry of Aging

**Class Schedule Title:**

Aging Biochemistry

**Academic Group: (College)**

NSM - Natural Sciences & Mathematics

**Academic Organization: (Department)**

Chemistry

**Will this course be offered through the College of Continuing Education (CCE)?**

No

**Catalog Year Effective:**

Fall 2023 (2023/2024 Catalog)

**Subject Area: (prefix)**

CHEM - Chemistry

**Catalog Number: (course number)**

267

**Course ID: (For administrative use only.)**

TBD

**Units:**

3

**Is the only purpose of this change to update the term typically offered or the enforcement of existing prerequisites at registration?**

No

**In what term(s) will this course typically be offered?**

Spring term only

**Does this course require a room for its final exam?**

Yes, final exam requires a room

**This course complies with the credit hour policy:**

Yes

**Justification for course proposal:**

This course is based on CHEM251 -Topics in Interdisciplinary Chemistry. I have taught that course several times now with focus on my research specialty: molecular aging research. This course has created a strong interest not only among graduate students, but also undergraduate students. Therefore, I am developing an undergraduate version of this Biochemistry of Aging class as CHEM167. However, since there will be considerable overlap between the graduate and undergraduate version of this course, it makes sense to develop a dedicated graduate level Biochemistry of Aging course and pair it with CHEM167. This dedicated course CHEM267 will add a much needed graduate level course to the Chemistry catalog.

In addition, both graduate and undergraduate students will greatly benefit from this pairing: The paired undergraduate course CHEM167 will be cross-listed with BIO120. Thus, the resulting undergraduate student population will have a wide breadth of backgrounds and background knowledge. The graduate student population in this course will be from our pool of graduate students, which likewise have very diverse backgrounds – with quite a variety of chemistry-related undergraduate degrees. In addition, many students are professionals working in the pharmaceutical industry. Together, these diverse student populations will cross-fertilize each other through peer-to-peer learning. Since this class will be discussion- and active-learning-heavy, this diversity in student background and knowledge is essential for effective peer-to-peer learning and will provide synergistic learning effects.

**Course Description: (Not to exceed 80 words and language should conform to catalog copy.)**

Aging is a process that has always intrigued humans, yet its causes and mechanisms have remained elusive. This course provides an introduction to modern aging research. It will cover theories and definitions of aging, and explore how organisms age. We will discuss in detail events at the biochemical level that contribute to the aging process. Using this molecular understanding of aging, we will lastly explore anti-aging interventions and means to increase life spans.

**Are one or more field trips required with this course?**

No

**Fee Course?**

No

**Is this course designated as Service Learning?**

No

**Is this course designated as Curricular Community Engaged Learning?**

No

**Does this course require safety training?**

No

**Does this course require personal protective equipment (PPE)?**

No

**Course Note: (Note must be a single sentence; do not include field trip or fee course notations.)**

Student may receive credit for only one of: Bio 120, Chem 167, Chem 267.

**Does this course have prerequisites?**

Yes

**Prerequisite:**

One semester of Biochemistry  
 At least one UD Biology course recommended(may be taken concurrently).

**Prerequisites Enforced at Registration?**

Yes

**Does this course have corequisites?**

No

**Graded:**

Letter

**Approval required for enrollment?**

No Approval Required

**Course Component(s) and Classification(s):**

Lecture

**Lecture Classification**

CS#02 - Lecture/Discussion (K-factor=1WTU per unit)

**Lecture Units**

3

**Is this a paired course?**

Yes

**Please confirm that it complies with the Paired Courses Policy and enter the course with which it is paired:**

CHEM167

**Is this course crosslisted?**

No

**Can this course be repeated for credit?**

No

**Can the course be taken for credit more than once during the same term?**

No

**Description of the Expected Learning Outcomes and Assessment Strategies:**

List the Expected Learning Outcomes and their accompanying Assessment Strategies (e.g., portfolios, examinations, performances, pre-and post-tests, conferences with students, student papers). Click the plus sign to add a new row.

	Expected Learning Outcome	Assessment Strategies
1	DESCRIBE phenotypes, definitions and theories of aging.	Quizzes and Exercise worksheets (Quizzes and Exercises that will cover the week's reading and lecture assignments.) Exams (There will be one mid-semester exam.)
2	EXPLAIN how aging can be measured in various organisms, and COMPARE the models used by researchers to investigate aging.	Quizzes and Exercise worksheets (Quizzes and Exercises that will cover the week's reading and lecture assignments.) Exams (There will be one mid-semester exam.)
3	EXPLAIN and SUMMARIZE the evidence for and mechanisms of biological systems that modulate aging.	Quizzes and Exercise worksheets (Quizzes and Exercises that will cover the week's reading and lecture assignments.) Student Lecture presentation (Students will present to the class a 30-40min lecture on an aging-related topic. This may be a group assignment.) Exams (There will be one mid-semester exam.)

4	IDENTIFY the components of common biological and biochemical pathways that modulate aging and longevity, and EXAMINE the scientific literature for the evidence of the involvement of those components.	Quizzes and Exercise worksheets (Quizzes and Exercises that will cover the week's reading and lecture assignments.) Student Lecture presentation (Students will present to the class a 30-40min lecture on an aging-related topic. This may be a group assignment.) Exams (There will be one mid-semester exam.)
5	COMPARE and EVALUATE anti-aging interventions.	Quizzes and Exercise worksheets (Quizzes and Exercises that will cover the week's reading and lecture assignments.) Exams (There will be one mid-semester exam.)
6	PLAN an experiment to address an unsolved question in aging research and, in turn, EVALUATE such an experiment by a peer.	Graduate Students will submit a grant proposal to research an aging-related question. The grant proposal, will be 'mock' peer-reviewed by the class. Peer-review will be conducted anonymously, and the average peer-review grade will be incorporated into the presentation grade.

**Attach a list of the required/recommended course readings and activities:**

CHEM267 Syllabus.docx

**For whom is this course being developed?**

Majors in the Dept  
Minors in the Dept  
Majors of other Depts

**Is this course required in a degree program (major, minor, graduate degree, certificate?)**

No

**Does the proposed change or addition cause a significant increase in the use of College or University resources (lab room, computer)?**

No

**Will there be any departments affected by this proposed course?**

No

**I/we as the author(s) of this course proposal agree to provide a new or updated accessibility checklist to the Dean's office prior to the semester when this course is taught utilizing the changes proposed here.**

I/we agree

**University Learning Goals**

**Graduate (Masters) Learning Goals:**

Critical thinking/analysis  
Communication  
Information literacy  
Disciplinary knowledge  
Professionalism

**Is this course required as part of a teaching credential program, a single subject, or multiple subject waiver program (e.g., Liberal Studies, Biology) or other school personnel preparation program (e.g., School of Nursing)?**

No

**Is this a Graduate Writing Intensive (GWI) course?**

No

**Please attach any additional files not requested above:**

Kneitel:Crawford Discussion.pdf  
Aging Support Letter.docx

**Reviewer Comments:**

**Thomas Krabacher (tsk) (Thu, 16 Mar 2023 01:20:06 GMT):** Rollback: Revise along the lines already discussed (Ben G. has the details). Resubmit by Friday noon, if possible,

Key: 14855