REGULAR MEETING OF THE RIVERSIDE DIVISION

TUESDAY, FEBRUARY 24, 2026
Zoom Videoconference
1:00 p.m.

ORDER OF BUSINESS

* Approval of all items on the Consent Calendar requires a single unanimous vote called for as the first order of business under Special Orders. At the request of any member of the Division, any such item must be withdrawn and considered in its regular order on the agenda [bylaw 4.1.2].

** Privilege and Floor Rights for Academic Senate Members (BL3.5)

†Reports received and placed on file "are received as presented and require no further action" [bylaw 4.1.3]. Only the reporting committee can change or withdraw these reports; however, at the request of any member of the Division, a report will be moved into its regular order on the agenda (Item 10. Reports of Standing Committees and Faculties) where it may be discussed, and motions relating to the report may be offered.

APPENDIX

February 11, 2025

F. Xu, Secretary-Parliamentarian
Riverside Division of the Academic Senate

MINUTES OF THE REGULAR MEETING OF THE RIVERSIDE DIVISION

MEETING

The Riverside Division of the Academic Senate met on Tuesday, December 2, 2025, at 1:01 p.m. in Genomics Building, Room 1102A. Chair Kenneth Barish presided. The meeting was attended by 55 members of the Riverside Division of the Academic Senate.

MINUTES

The Minutes of the Regular Meeting of May 20, 2025, were approved as presented.

ANNOUNCEMENTS BY THE PRESIDENT

There were no announcements by President Milliken as he was unable to attend.

ANNOUNCEMENTS BY THE CHANCELLOR AT RIVERSIDE

There were no announcements by Chancellor Hu as he was unable to attend.

ANNOUNCEMENTS BY THE VICE CHANCELLORS

There were no announcements by PEVC Watkins at this time.

ANNOUNCEMENTS BY THE DEANS OR OTHER EXECUTIVE OFFICERS

Chair Barish called upon the Secretary Parliamentarian, Feng Xu, to provide the report on election results. Secretary Parliamentarian Xu informed the Division that the results of the 2025-2026 recent elections for the Division, Colleges and Schools can be found on pages 11 & 12 of the meeting agenda.

There were several positions that had no more nominees than vacancies and there were no nominations received from the floor. The Division authorized the Secretary-Parliamentarian to cast a single ballot for all open positions.

ANNOUNCEMENTS BY THE CHAIR

Chair Barish addressed the Division with an acknowledgement of Faculty, Senate Committee members and Chairs, and Senate analysts for their engagement and work in maintaining strong shared governance. Chair Barish provided brief updates regarding changes within Systemwide such as the newly appointed President James Milliken. There has been positive feedback regarding interactions with President Milliken with particular praise for his open-door policy. This serves to give significant access formally and informally to discuss Senate matters with the most recent being the restoration of the PPFP hiring incentives. Chair Barish also mentioned that there are several areas of concern surrounding actions at other campuses resulting in Academic Council statements. A few of those actions were the Defense of the University, the potential agreement between the University and the Federal Government, and the Universities disclosure of personal identifiable information.

Chair Barish also acknowledged UCR's newly appointed Chancellor Jack Hu, who unfortunately was unavailable to attend this meeting due to prior engagements. Chair Barish shared that he is optimistic on the shared governance on UCR's campus as Chancellor Hu has already displayed significant progress by hosting a faculty retreat which resulted in a large participation from faculty.

Chair Barish provided feedback on positive developments regarding the Committee on Planning and Budget participating in budget hearings taking place this year and the budget templates being made available to the committee. One of the main objectives has been to create a more detailed working discussion with the Deans in terms of optimizing and understanding budgets moving forward with faculty FTE and other ratios.

Chair Barish mentioned systemwide reports on which the UCR division has provided feedback, including the Senate's Interim report of the Academic Senate Task Force on UC Adaptation to Disruptions (UCAD) and the interim and proposed changes to APM 015 and 016 regarding faculty discipline. All feedback and reports are made public once submitted. There are new committees being formed such as the Systemwide UCAD Plus that is meant to be the successor of the existing UCAD committee. UCAD Plus will not be solely a Senate committee but a Senate-Administrative committee and 5 sub-committees.

Chair Barish also discussed changes within the UCR campus. UCR is creating a Senate Student Evaluation of Teaching Workgroup that will take over the responsibilities of the current transitional Joint Senate-Administrative Teaching Evaluation Implementation
Committee that worked on a quarterly basis. This new work group will also be tasked with drafting bylaws for a new standing committee and formulating a guide for instructors. There is also a UCR Academic Senate Task Force on UC Adaptation to Disruptions (UCR-UCAD) being created to analyze any recommendations within the UCR context seeking broad faculty input via forms or surveys as well as being a committee available to make rapid recommendations to the administration related to the Systemwide UCAD Plus efforts.

Another group forming is the Senate-Administrative AI Council. This will be a permanent committee with a scope on the academic use of AI in teaching, learning, research, and student conduct. It will compile and develop and synthesize policies and advice as well as usage guidelines for AI tools. The charge of the committee is currently under development and expected to be completed by the end of the year.

Lastly, Chair Barish spoke about the recent Q&A style town hall that was hosted by the Senate that featured Chancellor Hu and Provost Watkins. Future quarterly town halls are planned to address issues or concerns faculty may have.

There were no questions from the floor.

SPECIAL ORDERS
The Consent calendar was unanimously approved.

The annual reports of standing committees, annual reports of the faculties, degree reports and regular reports of standing committees and faculties were received and placed on file.

REPORT OF THE REPRESENTATIVE TO THE ASSEMBLY
Riverside Assembly Senior Representative Manuela Martins-Green, noted that the reports from the Assembly meeting on June 12, 2025, can be found on page 136, and the Assembly meeting on October 9, 2025 can be found on page 138 of the full agenda.

Professor Martins-Green provided a brief summary of the June and October Assembly meetings. The full report can be found in the pages mentioned above.

REPORTS OF SPECIAL COMMITTEES
There were no reports of Special Committees.

REPORTS OF STANDING COMMITTEES AND FACULTIES
Professor Vagelis Hristidis, Chair of the Bourns College of Engineering Executive Committee, introduced and moved for adoption of the proposed Degree Program: B.S. in Computer Science Applications – 2nd Round (CSA) found on page 141 of the full agenda. The motion was approved.

Professor Austin Johnson, member of the School of Education Executive Committee, introduced and moved for adoption of the proposed changes to SOE Regulations 1 to 4.1.1—4th Round found on page 290 of the full agenda. The motion was approved.

Professor Harry Tom, Chair of the College of Natural and Agricultural Sciences Executive Committee, introduced and moved for adoption of the proposed Combined Degree Program: Bachelor of Science + Master of Science in Mathematics (Applied) Five Year (4+1) Combined 2nd Round found on page 370 of the full agenda. The motion was approved.

Professor Harry Tom, Chair of the College of Natural and Agricultural Sciences Executive Committee, introduced and moved for adoption of the proposed changes to the College of Natural and Agricultural Sciences Bylaws (Bylaw 4.1.1.1 Committee List) found on page 388 of the full agenda. The motion was approved.

Professor Qingfang Wang, member of the School of Public Policy Executive Committee, introduced and moved for adoption of the proposed Degree Program: Minor in Geospatial Analysis found on page 392 of the full agenda. The motion was approved.

Professor Adam Godzik, Chair of the School of Medicine Executive Committee, introduced and moved for adoption of the proposed changes to the School of Medicine Bylaw ME 5.5 found on page 513 of the full agenda. The motion was approved.

Professor Weitao Chen, member of Committee on Undergraduate Admissions, introduced and moved for adoption of the proposed changes to Undergraduate Admissions Committee Bylaw 8.23.1: Lived Name Policy found on page 516 of the full agenda. The motion was approved.

Professor Elizabeth Jacobs, member of the Committee on Privilege and Tenure, introduced and moved for adoption of the proposed changes to Committee on Privilege and Tenure Bylaws 8.19 through 8.19.2: Lived Name Policy, Committee membership & Ex-Officio Service found on page 518 of the full agenda. The motion was approved.

Professor Hyle Park, member of the Graduate Council, introduced and moved for adoption of the proposed changes to regulation 6.12-Campus Graduation Requirements found on page 522 of the full agenda. The motion was approved.

Professor Annika Speer, member of the Committee on Academic Freedom, introduced and moved for adoption of the proposed Resolution to Establish Mutual Academic Defense Compacts in Defense of Academic Freedom, Free Expression, Institutional Integrity, and the Research 533 of the full agenda. After brief discussion, the motion was approved. (21 in favor; 5 opposed)

Senate Chair Kenneth Barish on behalf of the Executive Council, introduced and moved for adoption of the proposed changes to Senate Bylaw 2.2 through 2.2.8: Lived Name Policy found on page 535 of the full agenda. The motion was approved.

PETITIONS OF STUDENTS
There were no student petitions.

UNFINISHED BUSINESS
There was no unfinished business.

UNIVERSITY AND FACULTY WELFARE
There were no issues related to University and Faculty Welfare for this Agenda.

NEW BUSINESS
There being no further business, the meeting was adjourned at 1:43 p.m.

ATTEST:

Feng Xu, Secretary-Parliamentarian
Riverside Division of the Academic Senate

Aneesah Kelley-Henry
Recording Secretary

SECRETARY-PARLIAMENTARIAN
REPORT TO THE RIVERSIDE DIVISION
FEBRUARY 24, 2026

2025-2026 RESULTS FROM THE CALLS FOR NOMINATIONS

To be received and placed on file:

1. COLLEGE OF HUMANITIES, ARTS & SOCIAL SCIENCES

A Call for Nominations was issued for the following position:

Chair of the Faculty, CHASS Executive Committee (2-year term)
Elected at large

After a second call, no valid nominations received.

The results from the Calls for Nominations will be posted on the Academic Senate website.

EXECUTIVE COMMITTEE
SCHOOL OF BUSINESS
REPORT TO THE RIVERSIDE DIVISION
FEBRUARY 24, 2026

To be adopted:

Proposed Changes to the Undergraduate Business Administration major (BSAD)

PRESENT:	**PROPOSED:**
Business Administration Major **1. Preparation for Business Administration major (6 courses [at least 23 units])** Major prerequisites (non-BUS courses may be used to satisfy breadth require-ments for the School of Business): (1) BUS 010 (2) BUS 020 (3) ECON 002 (4) ECON 003 (5) STAT 008 or STAT 010 or ECON 101 (6) MATH 022	**No change**
The major requirements for the B.S. in Business Administration are as follows: **2. Upper-division major requirements (19 courses [at least 77 units])** Core courses (at least 11 courses [at least 44 units]): ECON 102/ECON103, BUS 100W, BUS 101, BUS 102, BUS 103, BUS 104/STAT 104, BUS 105, BUS 106/BUS 133/ECON 134, BUS 107, BUS 108, BUS 109	**No change**
Concentration (At least 24 units per concentration): Students in the Business Administration major (BSAD) will be required to declare a concentration at least three quarters prior to graduation, provided they be allowed to change their concentration, if justified. The Office of Undergraduate Business Programs will manage the process. Students can declare up to two concentration.	**No change**
Choose six courses each from up to two of the concentrations listed below. Courses completed to meet core requirements may not be used to meet concentration requirements.	**No change**
Accounting and Auditing: BUS 154, BUS 160/ ECON 160, BUS 161, BUS 162/ECON 162, BUS 165A, BUS 165B,	**No change**

BUS 165C, BUS 166, BUS 167, BUS 168A, BUS 168B, BUS 169A, BUS 169B, BUS 170, BUS 198i	
Business Analytics: BUS 124, BUS 125, BUS 130, and at least three of the following: BUS 119, BUS 123, BUS 129, BUS 136, BUS 173, BUS 182	**No change**
Finance: If BUS 106 was taken as a core course, the requirements are: BUS 132, BUS 134, BUS 136 and at least three of the following: BUAS 101, BUS 131, BUS 135, BUS 137, BUS 138, BUS 139, BUS 140E, BUS 141, BUS 142, BUS 147 Or If BUS 133 was taken as a core course, the requirements are: BUS 134, BUS 136 and at least four of the following: BUAS 101, BUS 131, BUS 135, BUS 137, BUS 138, BUS 139, BUS 140E, BUS 141, BUS 142, BUS 147	**No change**
Information Systems: BUS 110, BUS 125, BUS 128, BUS 163, BUS 166, BUS 171, BUS 172, BUS 173, BUS 174, BUS 175, BUS 179, BUS 198i	**No change**
Management: BUS 120, BUS 121, BUS 143, BUS 144, BUS 145, BUS 146, BUS 147, BUS 148, BUS 149, BUS 150, BUS 154, BUS 155, BUS 156, BUS 157, ~~ANTH 105/BUS 158~~, BUS 163, BUS 173, BUS 177, BUS 198i	**Management:** BUS 120, BUS 121, BUS 143, BUS 144, BUS 145, BUS 146, BUS 147, BUS 148, BUS 149, BUS 150, BUS 154, BUS 155, BUS 156, BUS 157, BUS 163, BUS 173, BUS 177, BUS 198i
Marketing: BUS 111, BUS 112, BUS 113, BUS 114, BUS 115, BUS 116, BUS 117, BUS 118, BUS 119, BUS 151, BUS 152, BUS 159, BUS 164, BUS 198i	**No change**
Operations and Supply Chain Management: BUS 123, BUS 124, BUS 125, BUS 126, BUS 127/STAT 127,BUS 128, BUS 129, BUS 130, BUS 173, BUS 182	**No change**
Students choosing one concentration will take an additional 2 courses (at least 8 units) of Business Administration elective courses from BUS 110-BUS 199H, excluding BUS 190. Courses completed to satisfy the six-course concentration requirement may not be used to meet this requirement. Related courses outside of Business Administration may be approved to satisfy their requirement with the approval of the Associate Dean or Director of Undergraduate Business Programs. Students choosing two concentrations will not take elective courses but instead will take an additional 6	**No change**

courses (at least 24 units) in their second concentration.

Justifications (in sequential order):

BUS 158 has not been offered in more than four years (NOFY). CoC suggested deleting it from the catalog, and the management area has agreed.

Approvals:

Approved by the School of Business Undergraduate Committee:	October 3, 2025
Approved by the School of Business Executive Committee:	October 10, 2025
Approved by the Committee on Educational Policy:	November 18, 2025

EXECUTIVE COMMITTEE
COLLEGE OF ENGINEERING
REPORT TO THE RIVERSIDE DIVISION
FEBRUARY 24, 2026

To be adopted:

Proposed Changes to Computer Science Applications

PRESENT:	**PROPOSED:**
Major Requirements	**Major Requirements**
The Computer Science Applications major has two sets of requirements: a core set and a concentration set. Courses required by a concentration may also be used to satisfy breadth requirements.	[no change]
Core requirements	**Core requirements**
1. Lower-division requirements (38 units) a. ENGR 001M b. CS 009A and CS 009B and CS 009C c. CS 010C, CS 061 d. CS 011/MATH 011 e. MATH 009A or MATH 09HA; MATH 009B or MATH 09HB; MATH 009C or MATH 09HC; and either MATH 031 or EE 020B	1. Lower-division requirements (38 units) a. [no change] b. [no change] c. [no change] d. [no change] e. [no change]
2. Upper-division requirements (58 units) a. ENGR 101M b. CS100, CS 111, CS141, CS153 c. ENGR 180W d. STAT 155 or STAT 156A or ~~STAT 160~~ e. CS 105 f. CS 178A, CS 178B g. At least twenty (20) units of Computer Science technical electives to be chosen from an approved list of courses which currently includes ~~CS 108~~, CS110, ~~CS 120A~~, ~~CS 120B~~, CS 122A, CS 122B, CS 130, ~~CS131~~, CS 133, CS 135, CS 142, CS 144, CS 145, ~~CS/EE 147~~, CS 150, CS 152, CS 160, CS 161, CS 162, CS 164, CS 165, CS 166, CS 167, ~~CS/EE 168~~, CS 169, CS 170, ~~CS 171~~, ~~EE 142~~, CS 172, CS 173, CS 175, CS 177, CS 179 (E-Z) (4 units maximum), CS 180, CS 181, CS 182, CS 183, CS 193 (4 units maximum), MATH 120, MATH 126, MATH 135A, MATH 135B, PHIL 124	2. Upper-division requirements (58 units) a. [no change] b. [no change] c. [no change] d. STAT 155 or STAT 156A or STAT 160A e. [no change] f. [no change] g. At least twenty (20) units of Computer Science technical electives to be chosen from an approved list of courses which currently includes CS 108 / STAT 108, CS110, CS 120A / EE 120A, CS 120B /EE 120B, CS 122A, CS 122B, CS 130, CS131 / EE 131, CS 133, CS 135, CS 142, CS 144, CS 145, CS 147 / EE 147, CS 150, CS 152, CS 160, CS 161, CS 162, CS 164, CS 165, CS 166, CS 167, CS 168 / EE 168, CS 169, CS 170, CS 171 / EE 142, CS 172, CS 173, CS 175, CS 177, CS 179 (E-Z) (4 units maximum), CS 180, CS 181, CS 182, CS 183, CS 193 (4 units maximum), MATH 120, MATH 126,

The technical electives selected for 2.g) must be distinct from those used to satisfy the requirements specified in 2.a)–f) above with at least 16 units selected from Computer Science courses.

Concentration (at least 50 units)

Students in the **Computer Science Applications (CSA)** must declare a concentration upon admission to the program. A change in concentration, if justified, should be made at least three quarters prior to graduation.

3.1. Psychology (51 units)

h. PSYC 001, PSYC 002

i. PSYC 011, PSYC 012

j. At least two courses from CBNS 106 or PSYC 110, PSYC 132 or 134, PSYC 140, PSYC 150, PSYC 160 or PSYC 161 or PSYC 162 or PSYC 163

k. At least twenty four (24) units of Psychology technical electives to be chosen from an approved list of courses which currently includes PSYC 109, PSYC 112, PSYC 113, PSYC 115, PSYC 117, ~~PSYC 120~~, ~~PSYC 121~~, PSYC 122, ~~PSYC 126~~, ~~PSYC 128~~, PSYC 129, PSYC 130, PSYC131, PSYC 132, PSYC 133, PSYC 134, PSYC 135, PSYC 140, PSYC 142, PSYC 148, PSYC 149, PSYC 153, PSYC 155, PSYC 160, PSYC 161, PSYC 162, PSYC 163, PSYC 164, PSYC 165A, PSYC 165B, PSYC 166A, PSYC 166B, PSYC 166C, PSYC 166D, ~~PSYC 167~~, ~~PSYC 168~~, PSYC 169, PSYC 171, PSYC 175, PSYC 178

The technical electives selected for 3.1.d) must be distinct from those used to satisfy

MATH 135A, MATH 135B, PHIL 124
The technical electives selected for 2.g) must be distinct from those used to satisfy the requirements specified in 2.a)–f) above with at least 16 units selected from Computer Science courses.

Concentration (at least 50 units)

[no change]

3.1. Psychology (51 units)

h. [no change]

i. [no change]

j. [no change]

k. At least twenty four (24) units of Psychology technical electives to be chosen from an approved list of courses which currently includes PSYC 109, PSYC 112, PSYC 113, PSYC 115, PSYC 117, <u>CBNS 120 / PSYC 120</u>, <u>CBNS 121/ PSYC 121</u>, PSYC 122, <u>CBNS 126 / PSYC 126</u>, <u>LING 128 / PSYC 162</u>, PSYC 129, PSYC 130, PSYC131, PSYC 132, PSYC 133, PSYC 134, PSYC 135, PSYC 140, PSYC 142, PSYC 148, PSYC 149, PSYC 153, PSYC 155, PSYC 160, PSYC 161, PSYC 162, PSYC 163, PSYC 164, PSYC 165A, PSYC 165B, PSYC 166A, PSYC 166B, PSYC 166C, PSYC 166D, <u>ETST 167 / PSYC 167</u>, <u>ETST 168 / PSYC 168</u>, PSYC 169, PSYC 171, PSYC 175, PSYC 178
The technical electives selected for 3.1.d) must be distinct from those used to satisfy the requirements specified in 3.a)–c) above.

the requirements specified in 3.a)–c) above.

3.2. Business (50 units)

l. BUS 010, BUS 020

m. ECON 002 or ECON 002H; ECON 003 or ECON 003H

n. One course of 4 or more units from STAT 008, STAT 010, ECON 101

o. At least two courses from BUS 102, BUS 103, ~~BUS 104~~, BUS 105, ~~BUS 106~~, BUS 107, BUS 109

p. At least twenty (20) units of Business technical electives to be chosen from an approved list of courses which currently includes BUS 102, BUS 103, ~~BUS 104~~, BUS 105, ~~BUS 106~~, BUS 107, BUS 108, BUS 109, BUS 110, BUS 115, BUS 119, BUS 123, ~~BUS 124A~~, ~~BUS 124B~~, BUS 125, BUS 128, BUS 129, BUS 130, BUS 163, BUS 166, BUS 171, BUS 172, BUS 173, BUS 174, BUS175, BUS 179, SOC 150. Additionally, no credit will be given for BUS 101; and the following pairs of courses cannot both be taken for credit: BUS 125 and CS 177, BUS 163 and CS 175, BUS 171 and CS 180, BUS 173 and CS 166, BUS 175 and CS 164.

The technical electives selected for 3.2.e) must be distinct from those used to satisfy the requirements specified in 3.2.a)–d) above.

3.3 Health Science (71 units)

q. PHYS 002A or PHYS 002HA; PHYS 02LA or PHYS 02HLA; PHYS 002B or PHYS 02HB; PHYS 02LB or PHYS 02HLB; PHYS 002C or PHYS 002HC; PHYS 02LC or PHYS 02HLC

r. CHEM 001A or CHEM 01HA; CHEM 01LA or CHEM 1HLA; CHEM 001B or CHEM 01HB; CHEM 01LB or CHEM

3.2. Business (50 units)

l. [no change]

m. [no change]

n. [no change]

o. At least two courses from BUS 102, BUS 103, <u>BUS 104 / STAT 104</u>, BUS 105, <u>BUS 106 / ECON 134</u>, BUS 107, BUS 109

p. At least twenty (20) units of Business technical electives to be chosen from an approved list of courses which currently includes BUS 102, BUS 103, <u>BUS 104 / STAT 104</u>, BUS 105, <u>BUS 106 / ECON 134</u>, BUS 107, BUS 108, BUS 109, BUS 110, BUS 115, BUS 119, BUS 123, <u>BUS 124</u>, BUS 125, BUS 128, BUS 129, BUS 130, BUS 163, BUS 166, BUS 171, BUS 172, BUS 173, BUS 174, BUS175, BUS 179, SOC 150. Additionally, no credit will be given for BUS 101; and the following pairs of courses cannot both be taken for credit: BUS 125 and CS 177, BUS 163 and CS 175, BUS 171 and CS 180, BUS 173 and CS 166, BUS 175 and CS 164

The technical electives selected for 3.2.e) must be distinct from those used to satisfy the requirements specified in 3.2.a)–d) above.

3.3 Health Science (71 units)

q. [no change]

r. [no change]

1HLB; CHEM 001C or CHEM 01HC; CHEM 01LC or CHEM 1HLC	s. [no change]
s. CHEM 008A or CHEM 08HA; CHEM 08LA or CHEM 08HLA; CHEM 008B or CHEM 08HB; CHEM 08LB or CHEM 08HLB; CHEM 008C or CHEM 08HC; CHEM 08LC or CHEM 08HLC	t. [no change]
t. BIOL 005A and BIOL 005LA, BIOL 005B, BIOL 005C	u. [no change]
u. BCH 100 or BCH 100H or BCH 110 A or BCH110HA	
v. At least three courses from BIOL 102, BIOL 107A, BIOL 110, ~~BIOL 121/L~~, ~~BIOL 128~~, BIOL 161 A, BIOL 161B, BIOL 171A, BIOL 171B, ~~SOC 127 or PBPL 127~~, ~~SOC 167~~, PSYC 160, PSYC 178, BCH 110B or BCH110HB, BCH 110C or BCH 110HC, PBPL 160, PBPL 162	v. At least three courses from BIOL 102, BIOL 107A, BIOL 110, <u>BIOL 121 / MCBL 121</u>, <u>BIOL 121L / MCBL 121L</u>, <u>BIOL 128 / CBNS 128</u>, BIOL 161A, BIOL 161B, BIOL 171A, BIOL 171B, <u>PBPL 127 / SOC 127</u>, <u>PBPL 167 / SOC 167</u>, PSYC 160, PSYC 178, BCH 110B or BCH110HB, BCH 110C or BCH 110HC, PBPL 160, PBPL 162

Justification:

The Computer Science Applications (CSA) program was approved by the Academic Senate Division on December 2, 2025. However, a subsequent review of the catalog description revealed errors in the course listings. This proposal aims to rectify those issues while maintaining the program's original intent.

STAT 160A (Elements of Probability and Statistical Theory) is equivalent in rigor and content to STAT 155 and STAT 156A. While the original proposal correctly included STAT 160A in the comprehensive list, the catalog description erroneously listed it as 'STAT 160' which does not exist. This update corrects the requirement to align with the program's original intent.

BUS 124A and BUS 124B are no longer offered and a new course was created to replace them: BUS 124. This proposal updates list of upper electives for the Business concentration to reflect this change.

The following courses were modified to show cross-listed courses in the correct format, listing each course number alphabetically and separated by slash: CS 108 / STAT 108, CS 120A / EE 120A, CS 120B /EE 120B, CS131 / EE 131, CS 147 / EE 147, CS 168 / EE 168, CS 171 / EE 142, CBNS 120 / PSYC 120, CBNS 121/ PSYC 121, CBNS 126 / PSYC 126, LING 128 / PSYC 162, ETST 167 / PSYC 167, ETST 168 / PSYC 168, BUS 104 / STAT 104, BUS 106 / ECON 134, BIOL 121 / MCBL 121, BIOL 121L / MCBL 121L, BIOL 128 / CBNS 128, PBPL 127 / SOC 127, PBPL 167 / SOC 167.

With all of these changes we trust that the catalog description will now accurately reflect the courses that are required for completing the program.

Approvals:

Approved by the faculty of the Department of Computer Science and Engineering: January 7, 2026
Approved by the Executive Committee of the College of Engineering: January 12, 2026

Approved by the Committee on Educational Policy: January 29, 2026

EXECUTIVE COMMITTEE
COLLEGE OF NATURAL AND AGRICULTURAL SCIENCES
REPORT TO THE RIVERSIDE DIVISION
FEBRUARY 24, 2026

To be adopted:

Proposed changes to Environmental Science B.A. and B.S.

PRESENT:	**PROPOSED:**
Major Requirements	
The major requirements for both the B.A. and the B.S. degrees in Environmental Sciences are as follows: Students must fulfill all required core courses in environmental science, biology, chemistry, math, physics, and statistics with a grade point average of 2.0 or better and no grade lower than a C-. If a grade lower than a C- is received in 2 or more core courses required for the major, either in separate courses or repetitions of the same course, the student may be discontinued from the major. Students must, under such circumstances, petition the department to remain in the major. Students in Environ-mental Sciences are required to demonstrate adequate progress towards earning the degree. Adequate progress is defined as completion of MATH 009B or MATH 09HB or MATH 007B prior to the beginning of the Winter Quarter of the second year of residence or Junior standing (>90 units) and at least one course from ENSC 100, ENSC 101, or ENSC 102 must be completed prior to the end of the third year of residence or senior standing (>135 units).	[no change]
Note	
To gain maximum benefit from participating in the Undergraduate Research and Environmental Internship Programs, students intending to enroll in ENSC 197 and ENSC 198-I should contact their advisor during the quarter prior to enrollment in these courses.	[no change]
Core Requirements	

1. Lower-division requirements (~~78-80~~ units) a) ENSC 001 and ENSC 002	Lower-division requirements (75-77 units) [no change]
b) BIOL 005A, BIOL 05LA or BIOL 020, BIOL 005B	[no change]
c) CHEM 001A or CHEM 01HA, CHEM 001B or CHEM 01HB, CHEM 001C or CHEM 01HC, CHEM 01LA or CHEM 1HLA, CHEM 01LB or CHEM 1HLB, CHEM 01LC or CHEM 1HLC	[no change]
d) CHEM 008A and CHEM 08LA or CHEM 08HA and CHEM 08HLA; CHEM 008B and CHEM 08LB or CHEM 08HB and CHEM 08HLB	[no change]
e) MATH 007A or MATH 009A or MATH 09HA; MATH 007B or MATH 009B or MATH 09HB	[no change]
f) PHYS 002A or PHYS 02HA, PHYS 02LA or PHYS 02HLA, PHYS 002B or PHYS 02HB, PHYS 02LB or PHYS 02HLB, PHYS 002C or PHYS 02HC, PHYS 02LC or PHYS 02HLC	[no change]
~~g) POSC 010~~	g) STAT 010
~~h) STAT 010~~	h) One course from PBPL 001, ECON 003, POSC 010, or POSC 020
~~i) One course from PBPL 001, ECON 003, or POSC 020~~	i) ENSC 092
~~j) ENSC 092~~	
2. Upper-division requirements (18 units): ENSC 100, ENSC 101, ENSC 102, ENSC 110, ENSC 191	[no change]
Electives	
Students are free to choose from the lists below to fulfill their lower-division and upper-division elective requirements:	[no change]
1. Lower-division electives (8 units): At least two electives from BIOL 005C, CHEM 005, CHEM 008C and CHEM 08LC, CHEM 08HC and CHEM 08HLC, MATH 009C or	1. Lower-division electives (8 units) At least two electives from BIOL 005C, CHEM 005, CHEM 008C and CHEM 08LC, CHEM

MATH 09HC or MATH 010A, GEO 001 or GEO 002	08HC and CHEM 08HLC, MATH 009C or MATH 09HC or MATH 010A, GEO 001 or GEO 002, ENSC 003 or ENSC 004
2. Upper-division electives (20 units): At least 20 units of electives from the following list, with a minimum of 16 units from Environmental Sciences or Environmental Toxicology:	[no change]
ENTX 101, ENSC154/ENTX 154, ENSC 103/ENTX 103, ENSC 104, ENSC 105, ENSC 107, ENSC 120/NEM 120, ENSC 127, ENSC 130, ENSC 133/MCBL 133, ENSC 134/BPSC 134, ENSC135/CHEM 135/ENTX 135, ENSC 136/CHEM136, ENSC 138/GEO 138, ENSC 139/GEO 139, ENSC 140, ENSC 144/ENVE 144, ENSC 163, ENSC 165, ENSC 175, ENSC 177, ENSC 197, ENSC 198-I, BCH 100 or both BCH 110A or BCH 110HA and BCH 110B or BCH 110HB; BCH 110C or BCH 110HC or BIOL 107A; BIOL 102 or BIOL 121/MCBL 121; BIOL 116, BIOL 121L/MCBL 121L, BPSC 104/BIOL 104, BPSC 146, BPSC 165, BPSC 166, CBNS 150/ENTX 150, CHEM 109, GEO 157, GEO 160	[no change]
Suggested courses of study are also provided below for specialized areas in environmental sciences to assist students to meet minimum employment requirements for entry-level positions in government agencies, nongovernment organizations (NGO), and environmental consulting firms. Students are strongly encouraged to schedule a meeting with a Faculty in their specialization area of interest for curriculum and career advice. A list of core Faculty in each specialization area is available at envisci.ucr.edu/undergrad.	[no change]
Soil Sciences:	
Recommended to meet lower-division electives: BIOL 005C, GEO 001 or GEO 002, MATH 009C or MATH 09HC or MATH 010A; Recommended to meet upper-division electives: ENSC 104, ENSC 107, ENSC 120/NEM 120, ENSC 127, ENSC 133/MCBL 133, ENSC 134/BPSC 134, ENSC 138/GEO 138, ENSC 139/GEO 139, ENSC 144, ENSC 175, ENSC 177, BPSC 146	[no change]
Hydrologic Sciences:	

Recommended to meet lower-division electives: MATH 009C or MATH 09HC or MATH 010A, GEO 001 or GEO 002; Recommended to meet upper- division electives: ENSC 105, ENSC 107, ENSC 127, ENSC 136/CHEM136, ENSC 140, ENSC 163, ENSC 165, ENSC 175, ENSC 177	[no change]
Atmospheric Sciences:	
Recommended to meet lower-division electives: CHEM 005, CHEM 08C and CHEM 08LC, CHEM 08HC and CHEM 08HLC, MATH 009C or MATH 09HC or MATH 010A; Recommended to meet upper-division electives: ENSC 103/ENTX 103, ENSC 130, ENSC135/CHEM 135/ENTX 135, ENSC 136/CHEM 136, ENSC 175, ENSC 177, GEO 160	[no change]
Environmental Toxicology:	
Recommended to meet lower-division electives: BIOL 005C, CHEM 005, CHEM 008C and CHEM 08LC or CHEM 08HC and CHEM 8HLC; Recommended to meet upper- division electives: ENTX 101 required + at least 3 electives from ENSC or ENTX: ENSC 103/ENTX 103, ENSC 135/CHEM 135/ENTX 135, ENSC 136/CHEM 136, ENSC 177, CBNS 150/ENTX 150, ENSC 154/ ENTX 154, BCH 100 or both BCH 110A or BCH 110HA and BCH 110B or BCH 110HB, BIOL 102 or BIOL 121, BCH 110C or BCH 110HC or BIOL 107A	[no change]
Environmental Management:	
Recommended to meet lower-division electives: BIOL 005C, GEO 001 or GEO 002, MATH 009C or MATH 09HC or MATH 010A; Recommended to meet upper division electives: ENSC 103/ENTX 103, ENSC 144, ENSC 175, ENSC 177	[no change]

Justifications

1) Changing POSC 010 as an optional lower-divisional core requirement among PBPL 001, ECON 003, and POSC 020
   Currently, our ENSC majors are required to take two lower-divisional courses related to Social Science to satisfy the ENSC bachelor's degree: (1) POSC 010 (American Politics) and (2) Choose one course

from PBPL 001 (Intro to Public Policy Analysis), ECON 003 (Intro to Microeconomics), or POSC 020 (World Politics). Our students may benefit from taking courses that are more relevant to the concentrations of our current faculty (soil, hydrology, atmosphere, toxicology). Therefore, we propose to combine the current two requirements into one category:

"Choose one course from PBPL 001, ECON 003, POSC 010, or POSC 020"

so that our ENSC majors are only required to take one lower-divisional course related to Social Science to satisfy the ENSC bachelor's degree. Note that our ENSC majors are still required to take courses in humanity and social science to satisfy the CNAS breadth requirements, and the proposed change does not impact on the CNAS breadth requirements.

With this proposed change, the total number of required units for the lower-divisional requirements is to be reduced by 5. However, we also discovered that the total number of required units for the lower-divisional requirements in the current catalog is not correct: it should be 80–82. Therefore, the total number of required units for the lower-divisional requirements after the proposed change would be 75–77. No impact on ENSC Minor degree requirements.

Faculty voted on 10/31/2025 for changing POSC 010 as an optional lower-divisional core requirement. Voting results: In Favor 16, Against 2, Abstain 1, Not Available 1.

2) Addition of (ENSC 003 or ENSC 004) as a lower-divisional elective

ENSC 003 (Contemporary issues in Environmental Science) and ENSC 004 (Climate Change in California) are CHASS breadth courses but do not satisfy the ENSC bachelor's degree. However, some ENSC majors who took these courses in the past requested petition of them towards the lower-divisional unit requirements. Therefore, we propose that our ENSC majors may take one of ENSC 003 or ENSC 004 to satisfy the ENSC lower-divisional unit requirement. No impact on ENSC Minor degree requirements.

Faculty voted on 10/31/2025 for adding (ENSC 003 or ENSC 004) as a lower-divisional elective. Voting results: In Favor 18, Against 0, Abstain 1, Not Available 1.

Approvals:

Approved by the faculty of the Department of Environmental Science:	Oct. 31, 2025
Approved by the Executive Committee of the College of Natural and Agricultural Sciences:	Jan. 6, 2026
Approved by the Committee on Educational Policy:	Jan. 29, 2026

THE GRADUATE DIVISION AND EXECUTIVE COMMITTEES OF THE COLLEGES REPORT TO THE DIVISION FEBRUARY 24, 2026

To be received and placed on file:

Reports of Degrees Awarded – Summer 2025

Bourns College of Engineering
- Bachelor of Science: 76

College of Humanities, Arts and Social Sciences
- Bachelor of Arts: 442
- Bachelor of Science: 37

College of Natural and Agricultural Sciences
- Bachelor of Arts: 6
- Bachelor of Science: 214

School of Business
- Bachelor of Science: 176

School of Education
- Bachelor of Arts 29

School of Medicine
- PhD: 2
- MD……0
- Master of Science: 0

School of Public Policy
- Bachelor of Arts: 31

Report of Degrees Awarded – Fall 2025

Graduate Division
- Doctor of Philosophy: 64
- Master of Arts: 13
- Master of Business Administration: 8
- Master of Education: 3
- Master of Finance: 6
- Master of Fine Arts: 13
- Master of Professional Accountancy: 20
- Master of Public Health…….0
- Master of Public Policy: 1
- Master of Science: 161

The names of the candidates are filed in the official records of the Office of the Registrar.
F. Xu, Secretary-Parliamentarian
Riverside Division of the Academic Senate

Committee on Courses
Report to the Riverside Division
February 24, 2026

To be received and placed on file:
The Committee on Courses has approved the following courses.

Action:	Course:	Cross-listed Course(s):	Title:	Units:	Course Renumbered:
Undergraduate Courses:					
Change	AHS 010		TOPICS IN ART AND ARCHITECTURAL HISTORY	4 Units	
Change	AHS 010S		TOPICS IN ART AND ARCHITECTURAL HISTORY	5 Units	
Change	ANTH 141W		SOCIOCULTURAL PERSPECTIVES ON GRADUATE EDUCATION FUTURES	4 Units	
Change	BCH 185		EPIGENETICS IN DEVELOPMENT AND DISEASE	3 Units	
Change	BPSC 011		PLANTS AND HUMAN AFFAIRS	4 Units	
Change	BPSC 104	BIOL 104	FOUNDATIONS OF PLANT BIOLOGY	4 Units	
Change	BPSC 109	CBNS 109	EPIGENETICS	4 Units	
Change	BPSC 132	BIOL 132	PLANT ANATOMY	4 Units	
Change	BPSC 133		PLANT DIVERSITY AND EVOLUTION	5 Units	
Change	BPSC 183	BCH 183	PLANT BIOCHEMISTRY AND PHARMACOLOGY OF PLANT METABOLITES	4 Units	
Change	BUS 132		FOUNDATIONS OF FINANCE	4 Units	
Change	BUS 133		ACCELERATED FOUNDATIONS OF FINANCE	4 Units	
Change	CHN 003		FIRST-YEAR CHINESE	4 Units	
Change	CHN 004		SECOND-YEAR CHINESE	4 Units	
Change	CPLT 048	CHN 048	CHINESE CINEMA	4 Units	
Change	CPLT 063	SEAS 063; AST 063	READING SOUTHEAST ASIAN STORIES	4 Units	
Change	CPLT 111	EUR 120; GER 111; AHS 120	BERLIN METROPOLIS IN LITERATURE, FILM, MUSIC, AND ART	4 Units	AHS 120
Change	CPLT 115	GER 163; HISE 163	MODERN GERMAN HISTORY THROUGH FILM	4 Units	
Change	CRWT 013	CPLT 013	THE ART AND CRAFT OF STORYTELLING	4 Units	CRWT 012
Change	CRWT 171		ANATOMY OF POETRY	4 Units	
Change	CS 009C		C++ FOR PROGRAMMERS	4 Units	
Change	CS 122		INTERMEDIATE EMBEDDED AND REAL-TIME SYSTEMS	5 Units	CS 122A
Change	CS 147	EE 147	GRAPHICS PROCESSING UNIT COMPUTING AND PROGRAMMING	4 Units	EE 147
Change	CS 171	EE 142	INTRODUCTION TO MACHINE LEARNING AND DATA MINING	4 Units	
Change	CS 172		INTRODUCTION TO INFORMATION RETRIEVAL	4 Units	
Change	DNCE 019		INTRODUCTION TO DANCE STUDIES	4 Units	
Change	ECON 005		DATA ANALYSIS FOR ECONOMICS AND BUSINESS	5 Units	
Change	EE 110A		SIGNALS AND SYSTEMS	4 Units	
Change	EE 110B		SIGNALS AND SYSTEMS	4 Units	
Change	EE 114		PROBABILITY, RANDOM VARIABLES, AND RANDOM PROCESSES IN ELECTRICAL ENGINEERING	4 Units	
Change	EE 132		AUTOMATIC CONTROL	4 Units	
Change	ENGL 022		WRITING RED: NATIVE AMERICAN LITERATURE	4 Units	
Change	ENGL 023		INTRODUCTION TO BLACK WRITING	4 Units	
Change	ENGL 138A		AFRICAN AMERICAN LITERATURE TO 1940	4 Units	
Change	GSST 099		READING AND WRITING IN GENDER & SEXUALITY STUDIES	4 Units	
Change	GSST 129		FEMINIST CRITIQUES OF MILITARIZATION	4 Units	
Change	GSST 147		FEMINIST ANIMAL STUDIES	4 Units	
Change	GSST 151	ANTH 188	ISLAM, WOMEN, AND THE STATE	4 Units	
Change	GSST 154		FEMINIST STORYTELLING AND MEMORY WORK	4 Units	
Change	GSST 168	ANTH 189	GENDER AND POWER IN MUSLIM SOCIETIES	4 Units	
Change	GSST 169		GENDERING REVOLUTION: GENDER AND SEXUALITY IN "THE ARAB SPRING"	4 Units	
Change	GSST 182		APPLIED FEMINIST STUDIES	4 Units	
Change	GSST 183		FEMINIST POLITICS OF FOOD	4 Units	
Change	GSST 191B		SEMINAR IN GENDER AND SEXUALITY STUDIES: FEMINIST RESEARCH METHODS	4 Units	
Change	ITAL 045		ITALIAN CINEMA	4 Units	
Change	JPN 022		INTRODUCTION TO JAPANESE FILM	4 Units	
Change	JPN 037	AST 037; CPLT 037	JAPANESE SUBCULTURES AND THEIR MEDIA	4 Units	
Change	LABR 001		INTRODUCTION TO LABOR STUDIES	4 Units	
Change	MATH 161A		MATHEMATICAL FOUNDATIONS OF MACHINE LEARNING	4 Units	MATH 161
Change	MCS 046	SPN 046	INTRODUCTION TO GLOBAL NATIONAL OR REGIONAL MEDIA AND CULTURES	5 Units	
Change	MCS 110F		TOPICS IN FILM AND MEDIA HISTORY	4 Units	MCS 110
Change	MCS 170		SENIOR SEMINAR ON THE ANTHROPOCENE	5 Units	
Change	ME 156		MECHANICAL BEHAVIOR OF MATERIALS	4 Units	
Change	NASC 092		LOWER DIVISION SEMINAR IN THE NATURAL AND AGRICULTURAL SCIENCES	1 Unit	
Change	PBPL 060A		DATA ANALYSIS FOR PUBLIC POLICY 1	4 Units	PBPL 100A
Change	PBPL 060B		DATA ANALYSIS FOR PUBLIC POLICY 2	4 Units	PBPL 100B
Change	PBPL 198I		INDIVIDUAL INTERNSHIP IN PUBLIC POLICY	1 to 12 Units	
Change	POSC 107	GBST 107	NON WESTERN POLITICAL THOUGHT	4 Units	

Committee on Courses
Report to the Riverside Division
February 24, 2026

To be received and placed on file:
The Committee on Courses has approved the following courses.

Action:	Course:	Cross-listed Course(s):	Title:	Units:	Course Renumbered:
Change	POSC 112		MODERN POLITICAL THEORY	4 Units	
Change	POSC 116		CAPITALISM, SOCIALISM, AND POLITICAL THEORY	4 Units	
Change	POSC 116S		CAPITALISM, SOCIALISM, AND POLITICAL THEORY	5 Units	
Change	POSC 124S		INTERNATIONAL RELATIONS	5 Units	
Change	POSC 134S		POLITICAL ECONOMY OF INTERNATIONAL FINANCE	5 Units	
Change	POSC 136S		POLITICAL ECONOMY OF INTERNATIONAL MIGRATION	5 Units	
Change	POSC 144S		POLITICS THROUGH FILM	5 Units	
Change	POSC 150		HUMAN RIGHTS IN THEORY, LAW, AND POLITICS	4 Units	
Change	POSC 150S		HUMAN RIGHTS IN THEORY, LAW, AND POLITICS	5 Units	
Change	POSC 161	LNST 188	UNITED STATES AND LATIN AMERICAN RELATIONS	5 Units	
Change	POSC 163S		ETHNIC POLITICS	5 Units	
Change	POSC 173S		GOVERNMENT AND POLITICS OF CALIFORNIA	5 Units	
Change	POSC 198I		INDIVIDUAL INTERNSHIP IN POLITICAL SCIENCE	1 to 12 Units	
Change	PSYC 198G		GROUP INTERNSHIP IN PSYCHOLOGY	1 to 12 Units	
Change	SEHE 105		ENVIRONMENTAL HEALTH AND SOCIAL JUSTICE	4 Units	GSST 171
Change	SEHE 116		CLIMATE ANXIETY AND MENTAL HEALTH	4 Units	
Change	SEHE 175	LABR 175	TRANSFORMING TOXIC JOBS: HEALTH AND WORK IN THE UNITED STATES	4 Units	
Change	SPN 110		INTRODUCTION TO LITERARY CRITICISM AND ANALYSIS	4 Units	
Discontinue	CS 122B		ADVANCED EMBEDDED AND REAL-TIME SYSTEMS	5 Units	
Discontinue	EE 004		NANOTECHNOLOGY: SCIENCE, APPLICATIONS AND FUTURE	4 Units	
Discontinue	GSST 171		ENVIRONMENTAL HEALTH AND SOCIAL JUSTICE	4 Units	
Discontinue	MCS 022	AST 022	INTRODUCTION TO JAPANESE FILM	4 Units	JPN 022
Discontinue	MCS 044		ITALIAN CINEMA	4 Units	ITAL 045
Discontinue	MCS 047	AST 047	INTRODUCTION TO KOREAN FILM	4 Units	KOR 047
Discontinue	MCS 048	AST 048	CHINESE CINEMA	4 Units	CPLT 048
Discontinue	MCS 115		MODERN GERMAN HISTORY THROUGH FILM	4 Units	
Discontinue	MCS 157		AFROFUTURISM & THE VISUAL CULTURES OF HORROR	4 Units	
Discontinue	MCS 169	AST 185; CHN 185	NEW CHINESE CINEMA	4 Units	
Discontinue	MCS 178		BERLIN METROPOLIS IN LITERATURE, FILM, MUSIC, AND ART	4 Units	AHS 120
New	BCH 170		BIOCHEMISTRY OF NEURODEGENERATION	3 Units	
New	BUS 096		TRANSFER SUCCESS IN THE CLASSROOM	2 Units	
New	BUS 097		BUSINESS PATHWAYS TO SUCCESS	2 Units	
New	CBNS 094		ADVENTURES IN CELL, MOLECULAR & DEVELOPMENTAL BIOLOGY: ISSUES, CAREERS, AND MORE	1 or 2 Units	
New	CPLT 019	CLA 019; GSST 019	LOVE AND DESIRE: ANTIQUITY TO THE PRESENT	4 Units	
New	CPLT 119	SEAS 119	ECOPOETICS AGAINST WAR	4 Units	
New	CPLT 184	SEHE 154; SEAS 154	TYPHOONS AND OTHER DISASTERS	4 Units	
New	ECON 111		MACHINE LEARNING FOR ECONOMICS AND BUSINESS	4 Units	
New	EDUC 185		SOCIAL PSYCHOLOGY FOR EDUCATORS	4 Units	
New	ENGL 022S		WRITING RED: NATIVE AMERICAN LITERATURE	4 Units	
New	ENGL 023S		INTRODUCTION TO BLACK WRITING	4 Units	
New	GEO 050		EXPLORING EARTH AND PLANETARY SCIENCES	1 Unit	
New	HIST 043		THE RISE OF MODERN ASIA	4 Units	
New	HNPG 110		PREPARING FOR AN ADVANCED DEGREE & CAREER READINESS	2 Units	
New	LING 168		STATISTICS FOR LINGUISTICS	4 Units	
New	MATH 117		ADVANCED PROBLEM SOLVING	1 Unit	
New	MATH 161B		MATHEMATICAL FOUNDATIONS OF DEEP LEARNING	4 Units	
New	MATH 161C		MATHEMATICAL FOUNDATIONS OF ARTIFICIAL INTELLIGENCE	4 Units	
New	MCS 102E		TOPICS IN STATE VIOLENCE, POLICING AND CRIMINALIZATION	4 Units	
New	MCS 102F		TOPICS IN STATE VIOLENCE, POLICING AND CRIMINALIZATION	4 Units	
New	MCS 102G		TOPICS IN STATE VIOLENCE, POLICING AND CRIMINALIZATION	4 Units	
New	MCS 102I		TOPICS IN STATE VIOLENCE, POLICING AND CRIMINALIZATION	4 Units	
New	MCS 109F		COMPUTATION AND CULTURE	4 Units	
New	MCS 125I	LNST 125I; SPN 125I	TOPICS IN LATIN AMERICAN FILM AND MEDIA	4 Units	
New	MCS 147E		TOPICS IN AFROFUTURISM	4 Units	
New	MCS 147F		TOPICS IN AFROFUTURISM	4 Units	
New	MCS 168E		TOPICS IN ASIAN MEDIA AND CULTURES	4 Units	
New	MCS 168K		TOPICS IN ASIAN MEDIA AND CULTURES	4 Units	
New	MCS 168M		TOPICS IN ASIAN MEDIA AND CULTURES	4 Units	
New	PBPL 003		GLOBAL FOOD AND AGRICULTURAL POLICY	4 Units	
New	PBPL 151		GEOGRAPHIC INFORMATION SYSTEMS FOR URBAN TRANSPORTATION	4 Units	
New	PBPL 152		GEOPROGRAMMING	4 Units	
New	PBPL 153		MACHINE LEARNING AND DEEP LEARNING WITH GEOGRAPHIC INFORMATION SYSTEMS	4 Units	
New	PBPL 154		HUMAN-CENTERED SPATIAL DATA SCIENCE	4 Units	

Committee on Courses
Report to the Riverside Division
February 24, 2026

To be received and placed on file:
The Committee on Courses has approved the following courses.

Action:	Course:	Cross-listed Course(s):	Title:	Units:	Course Renumbered:
New	PBPL 156		GEOVISUALIZATION FOR PUBLIC POLICY	4 Units	
New	PBPL 158		ADVANCED SPATIAL ANALYSIS	4 Units	
New	PBPL 159		DRONES AND GEOSPATIAL ANALYSIS FOR PUBLIC POLICY	4 Units	
New	SEHE 160		INTRODUCTION TO EPIDEMIOLOGY IN GLOBAL AND COMMUNITY HEALTH	4 Units	
New	SPN 129		SOCCER AS POPULAR CULTURE IN THE GLOBAL HISPANOPHONE	4 Units	
New	SPN 151		TOPICS IN US LATINE THEATRE AND SOCIAL CHANGE	4 Units	
New	UGRD 120		TRANSFER SUCCESS PROGRAM TRANSFER TRANSITION & SUCCES	1 Unit	
Priority Enrollment	EDUC 162		LEARNING THEORY AND PSYCHOLOGY IN EDUCATION	4 Units	
Priority Enrollment	EDUC 171		READING AND LANGUAGE DEVELOPMENT	4 Units	
Priority Enrollment	EDUC 172		READING AND LANGUAGE DEVELOPMENT	4 Units	
Priority Enrollment	EDUC 177		READING AND WRITING IN THE CONTENT AREAS	4 Units	
Priority Enrollment	EDUC 178		READING AND WRITING IN THE CONTENT AREAS	4 Units	
Priority Enrollment	EDUC 179A		LANGUAGE DEVELOPMENT IN THE CONTENT AREAS FOR DIVERSE STUDENTS	4 Units	
Priority Enrollment	ENTM 100	BIOL 100	GENERAL ENTOMOLOGY	4 Units	
Priority Enrollment	ENTM 154	BIOL 154	FORENSIC ENTOMOLOGY	4 Units	
Priority Enrollment	ENTM 162	BIOL 162	INSECT BEHAVIOR	4 Units	
Graduate Courses:					
Change	CS 260		SEMINAR IN COMPUTER SCIENCE	4 Units	
Change	EDUC 271A		LANGUAGE, RACE, POWER, AND IDENTITY	4 Units	
Change	EDUC 271B		LANGUAGE, RACE, POWER, AND IDENTITY IN K12 CONTEXTS	4 Units	
Change	MGT 224		USER EXPERIENCE DESIGN FOR MARKETING STRATEGIES	4 Units	
Change	MGT 236		PERSONALIZATION & RECOMMENDATION SYSTEMS IN MARKETING	4 Units	
Change	MGT 251A		MARKETING ANALYTICS	4 Units	MGT 251
Change	MGT 254		STRATEGIC SOCIAL MEDIA MARKETING & CONTENT MANAGEMENT	4 Units	
Change	MGT 264		AI-POWERED CONSUMER INSIGHTS & MARKET RESEARCH	4 Units	
Discontinue	EDUC 259		RESEARCH SEMINAR	2 Units	
Discontinue	EE 211		ADAPTIVE SIGNAL PROCESSING	4 Units	
Discontinue	EE 222		ADVANCED RADIO-FREQUENCY INTEGRATED CIRCUIT DESIGN	4 Units	
Discontinue	EE 225		ERROR-CORRECTING CODES	4 Units	
Discontinue	EE 229		VIDEO PROCESSING AND COMMUNICATION	4 Units	
Discontinue	EE 238	ME 238	LINEAR MULTIVARIABLE CONTROL	4 Units	
Discontinue	EE 257		GLOBAL NAVIGATION SATELLITE SYSTEM SIGNAL PROCESSING AND RECEIVER DESIGN	4 Units	
Discontinue	EE 275		PROJECT IN VIDEO BIOINFORMATICS	2 Units	
Discontinue	EE 276		COLLOQUIUM IN VIDEO BIOINFORMATICS	1 Unit	
Discontinue	ENTX 203	ENSC 203	HUMAN AND ECOLOGICAL RISK ASSESSMENT	3 Units	
Discontinue	ENTX 205		BIOTRANSFORMATION OF ORGANIC CHEMICALS	4 Units	
Discontinue	ME 231	CS 233	PEN-BASED COMPUTING	4 Units	
New	BIEN 277		INTRODUCTION TO NEURAL ENGINEERING	4 Units	
New	MGT 251B		ADVANCED MARKETING-DRIVEN ANALYTICS WITH PROGRAMING	4 Units	
New	MGT 270A		FOUNDATION OF AI IN BUSINESS	4 Units	
New	MGT 270B		APPLIED AI IN BUSINESS	4 Units	
New	PBHL 289A		INTEGRATIVE LEARNING EXPERIENCE: THESIS	4 Units	
New	PBHL 289B		INTEGRATIVE LEARNING EXPERIENCE: CAPSTONE	4 Units	
New	PBPL 225		SURVEY DESIGN FOR PUBLIC POLICY	4 Units	
New	PBPL 263		LITIGATION AND PUBLIC POLICY	4 Units	
Split	EDUC 293A		INTRODUCTION TO PROFESSIONAL ISSUES IN GRADUATE EDUCATION	2 Units	EDUC 259
Split	EDUC 293B		PROFESSIONAL ISSUES IN ACADEMIC CONFERENCING, PUBLISHING, & APPLYING TO JOBS	2 Units	EDUC 259
Professional Courses:					
New	GDIV 310		DISSERTATION INTENSIVE	2 Units	
New	PSYC 302		TEACHING PSYCHOLOGY AT THE COLLEGE LEVEL AS INSTRUCTOR OF RECORD	1 Unit	
Extension Courses:					
Course	MGT X100		The Micro - Consulting Lab		
Course	MGT X200.10		Global HR Strategies for an Inclusive, Sustainable, and Tech-Driven Future		
Course	MGT X200.11		Global Marketing in an AI-Powered World		
Course	MGT X200.12		Multinational Financial Management		
Course	MGT X200.13		Strategic Management in a Digital Age		
Course	MGTX200.8		Professional Skills and AI Readiness for Today's Workplace		
Course	MGT X200.9		Navigating Intercultural Communication in the U.S. Workplace		
Instructor	EDUC X85.A		An Introduction to Early Childhood Studies: Child Growth and Development, Josuha Becker, M.S.E.		
Instructor	EDUC X85.B		The Role of Home, School and Community in Early Childhood Education, Josuha Becker, M.S.E.		
Instructor	EDUC X85.C		Developmentally Appropriate Curriculum in Early Childhood Education, Josuha Becker, M.S.E.		

Committee on Courses
Report to the Riverside Division
February 24, 2026

To be received and placed on file:
The Committee on Courses has approved the following courses.

Action:	Course:	Cross-listed Course(s):	Title:	Units:	Course Renumbered:
Instructor	EDUC X85.D		Health, Safety, and Nutrition in Early Childhood Education, Josuha Becker, M.S.E.		
Instructor	EDUC X85.E		Principles and Practices of Teaching Young Children, Josuha Becker, M.S.E.		
Instructor	EDUC X85.F		Observation and Assessment of Children's Social and Learning Development, Josuha Becker, M.S.E.		
Instructor	EDUC X85.G		Teaching Young Children in a Diverse Society, Josuha Becker, M.S.E.		
Instructor	EDUC X87.45		Infant and Toddler Development, Josuha Becker, M.S.E.		
Instructor	EDUC X87.46		Infant and Toddler Developmentally Appropriate Classroom Practices, Josuha Becker, M.S.E.		
Instructor	EDUC X88.63		Education and Care of Infants and Toddlers, Josuha Becker, M.S.E.		
Instructor	EDUC X81.3		Understanding the Foundations of Adult Learning for Early Education Coaches, Jennifer Butterworth, M.A.		
Instructor	EDUC X81.4		Practice-Based Coaching for Early Education Coaches, Jennifer Butterworth, M.A.		
Instructor	EDUC X85.A		An Introduction to Early Childhood Studies: Child Growth and Development, Jennifer Butterworth, M.A.		
Instructor	EDUC X85.C		Developmentally Appropriate Curriculum in Early Childhood Education, Jennifer Butterworth, M.A.		
Instructor	EDUC X85.D		Health, Safety, and Nutrition in Early Childhood Education, Jennifer Butterworth, M.A.		
Instructor	EDUC X85.E		Principles and Practices of Teaching Young Children, Jennifer Butterworth, M.A.		
Instructor	EDUC X85.F		Observation and Assessment of Children's Social and Learning Development, Jennifer Butterworth, M.A.		
Instructor	EDUC X85.H		Supervised Field Experience for Early Childhood Education, Jennifer Butterworth, M.A.		
Instructor	EDUC X87.45		Infant and Toddler Development, Jennifer Butterworth, M.A.		
Instructor	EDUC X87.46		Infant and Toddler Developmentally Appropriate Classroom Practices, Jennifer Butterworth, M.A.		
Instructor	EDUC X88.63		Education and Care of Infants and Toddlers, Jennifer Butterworth, M.A.		
Instructor	EDUC X88.A		Seminar in Administration and Supervision of Early Childhood Centers, Part A, Jennifer Butterworth, M.A.		
Instructor	EDUC X88.B		Seminar in Administration and Supervision of Early Childhood Education Centers, Part B, Jennifer Butterworth, M.A.		
Instructor	EDUC X85.A		An Introduction to Early Childhood Studies: Child Growth and Development, Melissa De La Cruz, M.A.		
Instructor	EDUC X85.B		The Role of Home, School and Community in Early Childhood Education, Melissa De La Cruz, M.A.		
Instructor	EDUC X85.C		Developmentally Appropriate Curriculum in Early Childhood Education, Melissa De La Cruz, M.A.		
Instructor	EDUC X85.D		Health, Safety, and Nutrition in Early Childhood Education, Melissa De La Cruz, M.A.		
Instructor	EDUC X85.E		Principles and Practices of Teaching Young Children, Melissa De La Cruz, M.A.		
Instructor	EDUC X85.F		Observation and Assessment of Children's Social and Learning Development, Melissa De La Cruz, M.A.		
Instructor	EDUC X85.G		Teaching Young Children in a Diverse Society, Melissa De La Cruz, M.A.		
Instructor	EDUC X85.H		Supervised Field Experience for Early Childhood Education, Melissa De La Cruz, M.A.		
Instructor	EDUC X87.45		Infant and Toddler Development, Melissa De La Cruz, M.A.		
Instructor	EDUC X87.46		Infant and Toddler Developmentally Appropriate Classroom Practices, Melissa De La Cruz, M.A.		
Instructor	EDUC X87.50		Overview of Children with Special Needs for Early Care and Education Providers, Melissa De La Cruz, M.A.		
Instructor	EDUC X87.55		Curriculum and Strategies for Children with Special Needs, Melissa De La Cruz, M.A.		
Instructor	EDUC X88.63		Education and Care of Infants and Toddlers, Melissa De La Cruz, M.A.		
Instructor	EDUC X89.1		Developing Effective Programs for Dual Language Learners, Melissa De La Cruz, M.A.		
Instructor	EDUCX85.A		An Introduction to Early Childhood Studies: Child Growth and Development, Brenda Montiel, M.S.		
Instructor	EDUCX85.B		The Role of Home, School and Community in Early Childhood Education, Brenda Montiel, M.S.		
Instructor	EDUCX81.4		Practice-Based Coaching for Early Education Coaches, Shanee Morgan, Psy.D.		
Instructor	EDUC X85.A		An Introduction to Early Childhood Studies: Child Growth and Development, Shanee Morgan, Psy.D.		
Instructor	EDUC X85.B		The Role of Home, School and Community in Early Childhood Education, Shanee Morgan, Psy.D.		
Instructor	EDUC X85.C		Developmentally Appropriate Curriculum in Early Childhood Education, Shanee Morgan, Psy.D.		
Instructor	EDUC X85.D		Health, Safety, and Nutrition in Early Childhood Education, Shanee Morgan, Psy.D.		
Instructor	EDUC X85.E		Principles and Practices of Teaching Young Children, Shanee Morgan, Psy.D.		

Committee on Courses
Report to the Riverside Division
February 24, 2026

To be received and placed on file:
The Committee on Courses has approved the following courses.

Action:	Course:	Cross-listed Course(s):	Title:	Units:	Course Renumbered:
Instructor	EDUCX85		Supervising Adults Within Early Childhood Educational Settings, Georgeann Padilla, M.Ed.		
Instructor	EDUC X85.A		An Introduction to Early Childhood Studies: Child Growth and Development, Georgeann Padilla, M.Ed.		
Instructor	EDUC X85.B		The Role of Home, School and Community in Early Childhood Education, Georgeann Padilla, M.Ed.		
Instructor	EDUC X85.C		Developmentally Appropriate Curriculum in Early Childhood Education, Georgeann Padilla, M.Ed.		
Instructor	EDUC X85.D		Health, Safety, and Nutrition in Early Childhood Education, Georgeann Padilla, M.Ed.		
Instructor	EDUC X85.E		Principles and Practices of Teaching Young Children, Georgeann Padilla, M.Ed.		
Instructor	EDUC X85.F		Observation and Assessment of Children's Social and Learning, Georgeann Padilla, M.Ed.		
Instructor	EDUC X85.G		Teaching Young Children in a Diverse Society, Georgeann Padilla, M.Ed.		
Instructor	EDUC X85.H		Supervised Field Experience for Early Childhood Education, Georgeann Padilla, M.Ed.		
Instructor	EDUCX87.45		Infant and Toddler Development, Georgeann Padilla, M.Ed.		
Instructor	EDUCX87.46		Infant and Toddler Developmentally Appropriate Classroom Practices, Georgeann Padilla, M.Ed.		
Instructor	EDUCX87.50		Overview of Children with Special Needs for Early Care and Education Providers, Georgeann Padilla, M.Ed.		
Instructor	EDUCX87.55		Curriculum and Strategies for Children with Special Needs, Georgeann Padilla, M.Ed.		
Instructor	EDUCX88.63		Education and Care of Infants and Toddlers, Georgeann Padilla, M.Ed.		
Instructor	EDUCX88.A		Seminar in Administration and Supervision of Early Childhood Centers, Part A, Georgeann Padilla, M.Ed.		
Instructor	EDUCX88.B		Seminar in Administration and Supervision of Early Childhood Education Centers, Part B, Georgeann Padilla, M.Ed.		
Instructor	EDUCX89.1		Developing Effective Programs for Dual Language Learners, Georgeann Padilla, M.Ed.		

COMMITTEE ON COURSES
REPORT TO THE RIVERSIDE DIVISION
FEBRUARY 24, 2026

To be received and placed on file:

The Committee on Courses has approved requests to allow the following instructors to teach upper division courses and graduate level courses as indicated:

INSTRUCTOR	DEPARTMENT/SCHOOL	LIMITS OF AUTHORIZATION	
Hernández-Bachman, C.	English	ENGL 126S	W'26
Valle, A.	English	ENGL 102W	W'26
Chacon, V.	Ethnic Studies	ETST 158	W'26
Saffie, N.	Hispanic Studies	SPN 130	W'26
Marin, A.	Psychology	PSYC 163	W'26
Radosic, N.	Psychology	PSYC 150	W'26
Hull, M.	Society, Environment, and Health Equity	SEHE 173/HIST 107	W'26

COMMITTEE ON COURSES
REPORT TO THE RIVERSIDE DIVISION
FEBRUARY 24, 2026

To be received and placed on file:

The Committee on Courses has approved the following course proposals for deletion, which have been listed in the General Catalog, but for at least four years, have not been offered, been offered with zero enrollment, or have been offered but canceled for deletion with the concurrence of the departments involved.

The following lists courses that were deleted and identified in the 2025-2026 Academic Year as part of the courses not offered for four or more year's process.

CS 122B	EE 004	ENTX 203	ME 231
	EE 211	ENTX 205	
	EE 222		
	EE 225		
	EE 229		
	EE 238		
	EE 257		
	EE 275		
	EE 276		

Courses scheduled to be approved for deletion:

RLST 024	ENTX 204	CS 233	ME 003
RLST 044W		EE 272	ME 138
RLST 098		EE 274	ME 140
RLST 117			ME 175D
RLST 131			ME 230
RLST 143			ME 232
RLST 146			ME 238
RLST 173			ME 242
RLST 179			ME 246
			ME 273

The following lists courses identified in the 2024-2025 Academic Year as part of the courses not offered for four or more year's process.

Courses scheduled to be approved for deletion:

CRWT 186B	ETST 225	BIEN 251	CEE 247	CS 122B	DNCE 155E
	ETST 227	BIEN 267	CEE 251	CS 233	DNCE 155F
	ETST 243F	BIEN 268	CEE 254		DNCE 155(E-Z)
	ETST 246		CEE 257		DNCE 172K
			CEE 261		
			CHE 171		

Courses previously approved for deletion:

BUS 158	CS 267	CRWT 136	ETST 108E	ETST 151	MCBL 130
	CS 269	CRWT 174	ETST 108F	ETST 152	
		DNCE 069A	ETST 109E	ETST 156	
			ETST 111	ETST 166	
		DNCE 069B	ETST 120	ETST 169	
			ETST 129	ETST 171	
		DNCE 114A	ETST 141A	ETST 173	
			ETST 141B	ETST 183	

DNCE 114B	ETST 191K
DNCE 114C	ETST 191S

The following lists courses that were deleted and identified in the 2023-2024 Academic Year as part of the courses not offered for four or more year's process.

MCS 169

Courses scheduled to be approved for deletion:

AHS 117	MCS 114	SOC 131H	GEO 132
AHS 145	MCS 142		GEO 167
			GEO 205
			GEO 221
			GEO 224
			GEO 225A

Courses previously approved for deletion:

AHS 159	MCS 021	SOC 002F
AHS 168	MCS 043	SOC 003H
AHS 169	MCS 103	SOC 123
AHS 185	MCS 113	SOC 125
	MCS 128	SOC 132
	MCS 138	SOC 156
	MCS 165	SOC 186G
		SOC 186E
		SOC 186F

The following lists courses identified in the 2022-2023 Academic Year as part of the courses not offered for four or more year's process.

Courses scheduled to be approved for deletion:

MATH 211B

Courses previously approved for deletion:

ARLC 158	CPLT 144	FREN 109A	PHIL 231	MUS 011	MATH 002
CHN 025	CPLT 158	FREN 109C	PHIL 232	MUS 013	MATH 137
CHN 105	CPLT 178	FREN 109D	PHIL 233	MUS 172	MATH 141
CHN 108	CPLT 219	ITAL 125G	PHIL 235	MUS 178	MATH
CLA 165	CPLT 272	ITAL 125S	PHIL 237	MUS 251	216B
CPLT 015	CPLT 273	ITAL 125T	PHIL 238	MUS 264	MATH 202
CPLT 018	CPLT 275	JPN 010A	PHIL 251	POSC 135	MATH 217
CPLT	CPLT 276	JPN 010B	PHIL 252	POSC 152	MATH 222
117/JPN 117		VNM	PHIL 259	POSC 156	MATH 233
		189/SEAS	PHIL 261	POSC 172	
		189			

The following lists courses identified in the 2021-2022 Academic Year as part of the courses not offered for four or more year's process.

Courses scheduled to be approved for deletion:

URST 178

URST 182
URST 184

Courses previously approved for deletion:

CHEM 092	CHEM 202	EDUC 230A	EDUC 258R	URST 172
CHEM 13HA	CHEM 264	EDUC 230B	EDUC 274	
	CHEM 281	EDUC 242C	EDUC 289	
		EDUC 247	EDUC 295A	
		EDUC 249	EDUC 335B	
			EDUC 335C	

COMMITTEE ON UNIVERSITY EXTENSION
REPORT TO THE RIVERSIDE DIVISION
FEBRUARY 24, 2026

DEPT	COURSE	TITLE	INSTRUCTOR FIRST NAME	INSTRUCTOR LAST NAME	INSTRUCTOR DEGREE	TYPE OF APPROVAL	APPROVED
Course Prereq		BIOL X463 prereq				Memo	01/20/26
Course Title Update		MGT X455.1 - SHRM Certification Prep+				Memo	01/20/26
		Professional Certificate in Infant and Toddler Care for Educators				X	11/07/25
		Professional Certificate in Advanced Teaching and Administration in Early Child Care Settings				X	11/07/25
		Postgraduate Certificate in Management				X	11/13/25
		Postgraduate Diploma with Internship in Digital Marketing				X	11/13/25
		Postgraduate Diploma with Internship in Management				X	11/13/25
		Postgraduate Diploma with Internship in Project Management - Revision				X	11/13/25
		Postgraduate Diploma with Internship in Digital Marketing				X	12/04/25
		Postgraduate Diploma with Internship in Management				X	12/04/25
		Postgraduate Diploma with Internship in Project Management - Revision				X	12/04/25
		Postgraduate Diploma with Internship in Applied Artificial Intelligence				X	12/04/25
		Postgraduate Diploma with Internship in Bioengineering Management				X	12/04/25
		Postgraduate Diploma with Internship in Engineering Management				X	12/04/25
		Postgraduate Diploma in Construction Management				X	12/04/25
EDUC	X81.3	Understanding the Foundations of Adult Learning for Early Education Coaches	Jennifer	Butterworth	M.A.	I*	01/15/26
EDUC	X81.4	Practice-Based Coaching for Early Education Coaches	Shanee C.	Morgan	Psy.D	I*	01/15/26
EDUC	X81.4	Practice-Based Coaching for Early Education Coaches	Jennifer	Butterworth	M.A.	I*	01/15/26
EDUC	X85	Supervising Adults Within Early Childhood Educational Settings	Georgeann	Padilla	M.Ed.	I*	01/15/26
EDUC	X85.A	An Introduction to Early Childhood Studies: Child Growth and Development	Brenda	Montiel	M.S.	I*	01/15/26
EDUC	X85.A	An Introduction to Early Childhood Studies: Child Growth and Development	Joshua	Becker	MSE	I*	01/15/26
EDUC	X85.A	An Introduction to Early Childhood Studies: Child Growth and Development	Jennifer	Butterworth	M.A.	I*	01/15/26
EDUC	X85.A	An Introduction to Early Childhood Studies: Child Growth and Development	Melissa	De La Cruz	M.A.	I*	01/15/26
EDUC	X85.A	An Introduction to Early Childhood Studies: Child Growth and Development	Robin	Fairfield	M.Ed	I	01/15/26
EDUC	X85.A	An Introduction to Early Childhood Studies: Child Growth and Development	Shanee C.	Morgan	Psy.D	I*	01/15/26
EDUC	X85.A	An Introduction to Early Childhood Studies: Child Growth and Development	Georgeann	Padilla	M.Ed.	I*	01/15/26
EDUC	X85.B	The Role of Home, School and Community in Early Childhood Education	Brenda	Montiel	M.S.	I*	01/15/26
EDUC	X85.B	The Role of Home, School and Community in Early Childhood Education	Joshua	Becker	MSE	I*	01/15/26
EDUC	X85.B	The Role of Home, School and Community in Early Childhood Education	Melissa	De La Cruz	M.A.	I*	01/15/26
EDUC	X85.B	The Role of Home, School and Community in Early Childhood Education	Robin	Fairfield	M.Ed	I	01/15/26
EDUC	X85.B	The Role of Home, School and Community in Early Childhood Education	Shanee C.	Morgan	Psy.D	I*	01/15/26
EDUC	X85.B	The Role of Home, School and Community in Early Childhood Education	Georgeann	Padilla	M.Ed.	I*	01/15/26
EDUC	X85.C	Developmentally Appropriate Curriculum in Early Childhood Education	Joshua	Becker	MSE	I*	01/15/26
EDUC	X85.C	Developmentally Appropriate Curriculum in Early Childhood Education	Jennifer	Butterworth	M.A.	I*	01/15/26
EDUC	X85.C	Developmentally Appropriate Curriculum in Early Childhood Education	Melissa	De La Cruz	M.A.	I*	01/15/26
EDUC	X85.C	Developmentally Appropriate Curriculum in Early Childhood Education	Robin	Fairfield	M.Ed	I	01/15/26
EDUC	X85.C	Developmentally Appropriate Curriculum in Early Childhood Education	Shanee C.	Morgan	Psy.D	I*	01/15/26
EDUC	X85.C	Developmentally Appropriate Curriculum in Early Childhood Education	Georgeann	Padilla	M.Ed.	I*	01/15/26
EDUC	X85.D	Health, Safety, and Nutrition in Early Childhood Education	Joshua	Becker	MSE	I*	01/15/26
EDUC	X85.D	Health, Safety, and Nutrition in Early Childhood Education	Jennifer	Butterworth	M.A.	I*	01/15/26
EDUC	X85.D	Health, Safety, and Nutrition in Early Childhood Education	Melissa	De La Cruz	M.A.	I*	01/15/26
EDUC	X85.D	Health, Safety, and Nutrition in Early Childhood Education	Robin	Fairfield	M.Ed	I	01/15/26
EDUC	X85.D	Health, Safety, and Nutrition in Early Childhood Education	Shanee C.	Morgan	Psy.D	I*	01/15/26
EDUC	X85.D	Health, Safety, and Nutrition in Early Childhood Education	Georgeann	Padilla	M.Ed.	I*	01/15/26
EDUC	X85.E	Principles and Practices of Teaching Young Children	Joshua	Becker	MSE	I*	01/15/26
EDUC	X85.E	Principles and Practices of Teaching Young Children	Jennifer	Butterworth	M.A.	I*	01/15/26
EDUC	X85.E	Principles and Practices of Teaching Young Children	Melissa	De La Cruz	M.A.	I*	01/15/26
EDUC	X85.E	Principles and Practices of Teaching Young Children	Robin	Fairfield	M.Ed	I	01/15/26
EDUC	X85.E	Principles and Practices of Teaching Young Children	Shanee C.	Morgan	Psy.D	I*	01/15/26

COMMITTEE ON UNIVERSITY EXTENSION
REPORT TO THE RIVERSIDE DIVISION
FEBRUARY 24, 2026

DEPT	COURSE	TITLE	INSTRUCTOR FIRST NAME	INSTRUCTOR LAST NAME	INSTRUCTOR DEGREE	TYPE OF APPROVAL	APPROVED
EDUC	X85.E	Principles and Practices of Teaching Young Children	Georgeann	Padilla	M.Ed.	I*	01/15/26
EDUC	X85.F	Observation and Assessment of Children's Social and Learning Development	Joshua	Becker	MSE	I*	01/15/26
EDUC	X85.F	Observation and Assessment of Children's Social and Learning Development	Jennifer	Butterworth	M.A.	I*	01/15/26
EDUC	X85.F	Observation and Assessment of Children's Social and Learning Development	Melissa	De La Cruz	M.A.	I*	01/15/26
EDUC	X85.F	Observation and Assessment of Children's Social and Learning	Robin	Fairfield	M.Ed	I	01/15/26
EDUC	X85.F	Observation and Assessment of Children's Social and Learning	Georgeann	Padilla	M.Ed.	I*	01/15/26
EDUC	X85.G	Teaching Young Children in a Diverse Society	Joshua	Becker	MSE	I*	01/15/26
EDUC	X85.G	Teaching Young Children in a Diverse Society	Melissa	De La Cruz	M.A.	I*	01/15/26
EDUC	X85.G	Teaching Young Children in a Diverse Society	Robin	Fairfield	M.Ed	I	01/15/26
EDUC	X85.G	Teaching Young Children in a Diverse Society	Georgeann	Padilla	M.Ed.	I*	01/15/26
EDUC	X85.H	Supervised Field Experience for Early Childhood Education	Jennifer	Butterworth	M.A.	I*	01/15/26
EDUC	X85.H	Supervised Field Experience for Early Childhood Education	Melissa	De La Cruz	M.A.	I*	01/15/26
EDUC	X85.H	Supervised Field Experience for Early Childhood Education	Robin	Fairfield	M.Ed	I	01/15/26
EDUC	X85.H	Supervised Field Experience for Early Childhood Education	Georgeann	Padilla	M.Ed.	I*	01/15/26
EDUC	X87.45	Infant and Toddler Development	Georgeann	Padilla	M.Ed.	I*	01/15/26
EDUC	X87.45	Infant and Toddler Development	Joshua	Becker	MSE	I*	01/15/26
EDUC	X87.45	Infant and Toddler Development	Jennifer	Butterworth	M.A.	I*	01/15/26
EDUC	X87.45	Infant and Toddler Development	Melissa	De La Cruz	M.A.	I*	01/15/26
EDUC	X87.46	Infant and Toddler Developmentally Appropriate Classroom Practices	Georgeann	Padilla	M.Ed.	I*	01/15/26
EDUC	X87.46	Infant and Toddler Developmentally Appropriate Classroom Practices	Joshua	Becker	MSE	I*	01/15/26
EDUC	X87.46	Infant and Toddler Developmentally Appropriate Classroom Practices	Jennifer	Butterworth	M.A.	I*	01/15/26
EDUC	X87.46	Infant and Toddler Developmentally Appropriate Classroom Practices	Melissa	De La Cruz	M.A.	I*	01/15/26
EDUC	X87.50	Overview of Children with Special Needs for Early Care and Education Providers	Georgeann	Padilla	M.Ed.	I*	01/15/26
EDUC	X87.50	Overview of Children with Special Needs for Early Care and Education Providers	Melissa	De La Cruz	M.A.	I*	01/15/26
EDUC	X87.55	Curriculum and Strategies for Children with Special Needs	Georgeann	Padilla	M.Ed.	I*	01/15/26
EDUC	X87.55	Curriculum and Strategies for Children with Special Needs	Melissa	De La Cruz	M.A.	I*	01/15/26
EDUC	X88.63	Education and Care of Infants and Toddlers	Georgeann	Padilla	M.Ed.	I*	01/15/26
EDUC	X88.63	Education and Care of Infants and Toddlers	Joshua	Becker	MSE	I*	01/15/26
EDUC	X88.63	Education and Care of Infants and Toddlers	Jennifer	Butterworth	M.A.	I*	01/15/26
EDUC	X88.63	Education and Care of Infants and Toddlers	Melissa	De La Cruz	M.A.	I*	01/15/26
EDUC	X88.A	Seminar in Administration and Supervision of Early Childhood Centers, Part A	Georgeann	Padilla	M.Ed.	I*	01/15/26
EDUC	X88.A	Seminar in Administration and Supervision of Early Childhood Centers, Part A	Jennifer	Butterworth	M.A.	I*	01/15/26
EDUC	X88.B	Seminar in Administration and Supervision of Early Childhood Education Centers, Part B	Jennifer	Butterworth	M.A.	I*	01/15/26
EDUC	X89.1	Developing Effective Programs for Dual Language Learners	Melissa	De La Cruz	M.A.	I*	01/15/26
MGT	X100	The Micro - Consulting Lab				C	12/04/25
MGT	X100	The Micro - Consulting Lab	Nidhi	Shah	Ph.D.	I	12/04/25
MGT	X200.10	Global HR Strategies for an Inclusive, Sustainable, and Tech-Driven Future	Jo	Russo-Pereyra	M.P.A.	I	12/01/25
MGT	X200.10	Global HR Strategies for an Inclusive, Sustainable, and Tech-Driven Future				C	12/01/25
MGT	X200.11	Global Marketing in an AI-Powered World	Julia	Bennett	M.P.P	I	12/01/25
MGT	X200.11	Global Marketing in an AI-Powered World				C	12/01/25
MGT	X200.12	Multinational Financial Management	Francisca	Beer		I	12/04/25
MGT	X200.12	Multinational Financial Management	-	-	-	C	01/15/26
MGT	X200.13	Strategic Management in a Digital Age	Joan	Branin	Ph.D.	I	12/01/25
MGT	X200.13	Strategic Management in a Digital Age				C	12/01/25
MGT	X200.8	Professional Skills and AI Readiness for Today’s Workplace	Jo Lynn	Russo Pereyra	M.P.A.	I	12/01/25
MGT	X200.8	Professional Skills and AI Readiness for Today’s Workplace	-	-	-	C	12/01/25
MGT	X200.8	Professional Skills and AI Readiness for Today’s Workplace	Julia	Bennett	M.P.P	I	12/01/25
MGT	X200.8	Professional Skills and AI Readiness for Today’s Workplace	Nidhi	Shah	Ph.D.	I	12/01/25
MGT	X200.9	Navigating Intercultural Communication in the U.S. Workplace	Shawntia	Key	Ed.D.	I	12/01/25
MGT	X200.9	Navigating Intercultural Communication in the U.S. Workplace				C	12/01/25
ENGL	X410.91	Contents and Methods for Teaching Capstone Advanced Placement Seminar				C	01/20/26
ENGL	X410.92	Contents and Methods for Teaching Capstone Advanced Placement Research				C	01/20/26

COMMITTEE ON UNIVERSITY EXTENSION
REPORT TO THE RIVERSIDE DIVISION
FEBRUARY 24, 2026

DEPT	COURSE	TITLE	INSTRUCTOR FIRST NAME	INSTRUCTOR LAST NAME	INSTRUCTOR DEGREE	TYPE OF APPROVAL	APPROVED
ENGL	X410.93	Contents and Methods for Teaching Capstone Advanced Placement Seminar for ELA				C	01/20/26
BUS	X425.06	Contents and Methods for Teaching Advanced Placement Project Based Learning Business and Personal Finance				C	01/20/26
GEO	X425.2A	Finding Your Way: Basics of Map & Compass				C	01/20/26
GEO	X425.2A	Finding Your Way: Basics of Map & Compass	Misha	Askren	M.D.	I	01/20/26
GEO	X426	Hot Stuff: Geology of Amboy Crater				C	01/20/26
GEO	X426	Hot Stuff: Geology of Amboy Crater	Alessandro	Grippo	Ph.D.	I	01/20/26
GEO	X440.6	Rock'n'Roll: The Geology & Fault Lines of Joshua Treen National Park				C	01/20/26
GEO	X440.6	Rock'n'Roll: The Geology & Fault Lines of Joshua Treen National Park	Alessandro	Grippo	Ph.D.	I	01/20/26
EDUC	X444.A	Transitional Kindergarten: Child Growth and Development	Brenda	Montiel	M.S.	I*	01/20/26
EDUC	X444.A	Transitional Kindergarten: Child Growth and Development	Joshua	Becker	MSE	I*	01/22/26
EDUC	X444.A	Transitional Kindergarten: Child Growth and Development	Jennifer	Butterworth	M.A.	I*	01/20/26
EDUC	X444.A	Transitional Kindergarten: Child Growth and Development	Melissa	De La Cruz	M.A.	I*	01/20/26
EDUC	X444.B	Diversity and Responsive Teaching in a Transitional Kindergarten Classroom	Melissa	De La Cruz	M.A.	I*	01/20/26
EDUC	X444.C	Home, School, and Community Collaborations for Transitional Kindergarten	Shanee C.	Morgan	Psy.D	I*	01/20/26
EDUC	X444.C	Home, School, and Community Collaborations for Transitional Kindergarten Teachers	Joshua	Becker	MSE	I*	01/22/26
EDUC	X444.C	Home, School, and Community Collaborations for Transitional Kindergarten Teachers	Melissa	De La Cruz	M.A.	I*	01/20/26
EDUC	X444.E	The Transitional Kindergarten Curriculum	Jennifer	Butterworth	M.A.	I*	01/20/26
STAT	X451	Contents and Methods for Teaching Advanced Placement Project Based Learning Statistics				C	01/20/26
ENSC	X452	Contents and Methods for Teaching Advanced Placement Project Based Learning Environmental Science				C	01/20/26
GEO	X454	Contents and Methods for Teaching Advanced Placement Project Based Learning Human Geography				C	01/20/26
MGT	X456.1	Navigating Crucial Conversations	Julia	Bennett	M.P.P.	I	01/20/26
MGT	X469.02	Communicating Effectively	Julia	Bennett	M.P.P	I	01/20/26
HIST	X475.8	Contents and Methods for Teaching Advanced Placement Project Based Learning World History: Modern				C	01/20/26
POSC	X491	Contents and Methods for Teaching Advanced Placement Project Based Learning U.S. Government and Politics				C	01/20/26

Type of Approval Key:
X - Certificate or Diploma Program
C - Course Proposal
I - Instructor Proposal for Previously Approved Intructor at UCR
I* - Instructor Proposal for First Time Instructor at UCR

EXECUTIVE COUNCIL
REPORT TO THE RIVERSIDE DIVISION
FEBRUARY 24, 2026

To be received and placed on file:

Naming of University Properties, Programs, & Facilities
The Executive Council reports the following item that was approved per UCR Policy 450-25: *Naming of University Properties, Programs, & Facilities*. The Academic Senate Chair distributed background information packet for proposed namings to the Executive Council for approval memo to University Advancement:

Naming of the Physics Room #3035, Physics Building to the Desai Lecture Hall.

Report from the Special Assembly meeting on November 20, 2025

To the UCR Division meeting on February 24th

Unfinished Business (3:15 - 4:30 pm)

1. Resolution Concerning the Disclosure of Names of Faculty, Students, and Staff

The discussions on this issue continue and no final version has been brought up for a vote yet. We hope to report on the outcomes at our next Division Meeting.

Report from the Assembly meeting on January 15th 2026,

to the UCR Division meeting on February 24th

This report contains exerts of the minutes generated by the staff to the Assembly for the meeting on 01/15/26

Announcements by Chair Palazoglu

Federal Investigations: Chair Palazoglu reported that the UC leadership has maintained its position of not initiating litigation and instead seeking good-faith dialogue with federal authorities.

UCAD Plus: UCAD Plus, the successor to the Senate task force on *UC Adaptation to Disruptions (UCAD)*, was launched in Nov 2025. It includes five work groups composed of senate members and administrators coming from all of the campuses. The various committees are overseen by a joint steering committee with members from every campus. Detailed information is found in the UCAD Plus website [https://senate.universityofcalifornia.edu/committees/ucad-plus.html]. In the meantime, UCAD is finalizing its report which will be instrumental in guiding the work of UCAD plus.

The five primary focus areas are listed here. For specific goals and group participants for each area, please consult the website.

1. Research activities and infrastructure: Addressing both broad and targeted budget cuts and grant interruptions with a direct impact on UC's research mission, as well as follow-on impacts on research infrastructure due to changes in IDC (Indirect Cost) rates. 2. Academic personnel evaluations: Assessing how changes in the research funding landscape will impact UC faculty's ability to conduct their research and to progress in their careers.
3. Academic program planning, evaluation, and alignment: Assessing financial limitations and seeking ways to ensure program sustainability while maintaining academic quality at both the undergraduate and graduate levels.
4. Instructional opportunities and course oWerings across modalities: Preserving course availability and instructional continuity amid both short-term disruptions and longer-term resource pressures.
5. The future of graduate education: Assessing the structure, delivery, and support systems for graduate education across UC.

Math Preparation: The November 2025 UCSD report on first-year student preparedness pointed out concerns about declining math readiness among entering

students. As a result, Senate leadership and the Board of Admissions and Relations with Schools (BOARS) are discussing the issues and preparing next steps.

PUDP: The Task Force on the Performance of Undergraduate Degree Programs (PUDP) is developing an assessment framework for undergraduate degree quality, with particular attention to online programs. An interim report is expected by the end of winter quarter in 2026. Currently there is only one approved fully online undergraduate major in the UC system. However, interest from Regents and administrators is growing, and the Senate continues to emphasize careful, quality-focused oversight of online programs.

Several members expressed concern about the potential UAW labor action, particularly the lack of clarity around timing and the implications for instruction and staWing. Chair Palazoglu acknowledged the uncertainty and noted that guidance for faculty is being developed. Since then, we have received communication from Provost Newman which assures us that the administration is doing all possible to avoid a strike but that were it to come about that OP will notify us and provide guidelines.

President Milliken

President Milliken reiterated that UC rejected the proposed $1 billion payment first proposed in August 2025, and that while the University remains open to good faith discussions with the federal government, it will not compromise its governance, academic freedom, or mission. He reported that following federal court decisions, most funding has been restored and no additional penalties imposed since August, though uncertainty remains.

He also referenced the regents' recent renewal of the tuition stability plan as an important source of predictability.

President Milliken emphasized the importance of continued systemwide planning and cost containment eWorts, including initiatives focused on streamlining administrative operations. When asked for additional details President Milliken noted that meaningful opportunities exist to reduce administrative complexity and improve operational eWectiveness across the system, and that this work is a high priority for him.

Nathan Brostrom (CFO)

Budget: CFO Brostrom mentioned that the January budget was very favorable for the UC. Governor's provided a 7% increase for the UC (350million) reflecting the 2026-27 compact increase and partial repayment of deferred funding.

The CFO outlined 3 potential state bond measures under consideration: a UC/CSU bond, a housing bond, and State Senate Bill (SB) 607 (Wiener), which would place a $23 billion research bond on the November 2026 ballot. These bonds could help address capital and research funding needs given ongoing federal funding uncertainties.

He also discussed systemwide administrative eWorts to address structural deficits driven by rising labor and benefit costs through improved investment management, process redesign, and automation, while reducing unnecessary administrative burden on faculty and staW.

Provost Newman

The Provost pointed out that a survey of California voters showed overwhelming confidence in UC's research, medical, and educational missions, confidence reflected in the strong bond market response to UC issuances.

Provost Newman again emphasized the importance of the succeeding in obtaining the state research bond to help oWset the problems with federal funding noted above. In addition, she described eWorts to expand international research collaborations especially with the Russel Group min England and the Horizon programs in the European Union. The idea is to identify shared research priorities and also, alternative funding sources. She provided updates on several academic initiatives, including the Degree Plus pilot program at UCSD and UCSB, which integrates extension coursework and paid internships, and on the launch of Early Career Research Awards, with a first cohort expected in April 2026. In addition, they are also in conversations with the Mellon Foundation for potential new support for faculty in the humanities and humanistic social sciences.

We also discussed the potential for a graduate student strike. The provost said that OP is in intense discussions with the Union to improve the outcomes but expressed cautious optimism about the negotiations.

Amendments to Academic Personnel Manual Sections 015 and 016

Chair Palazoglu introduced proposed revisions to Academic Personnel Manual (APM) - 015 (*The Faculty Code of Conduct*) and 016 (*University Policy on Faculty Conduct and the Administration of Discipline*). These 2 APMs underwent extensive joint Senate–administration review including the required 90-day systemwide Senate review and consultation process. There were multiple iterations of a joint workgroup, consultation with campus Privilege and Tenure committees, engagement with Regents' leadership, and additional analysis by a University Committee on Privilege and Tenure (UCPT) workgroup. The changes were

intended to improve the clarity, consistency, and timeliness of the faculty disciplinary process while preserving core principles of due process, academic freedom, and Senate authority. Key elements of the revised APM language include:

- The establishment of a Systemwide Reserve Privilege and Tenure Pool, coordinated by UCPT, which draws on existing Senate practices by including faculty with prior P&T experience who may be called upon as needed to constitute part or all of a hearing committee, if a campus is unable to appoint suWicient faculty in a timely way. This ensures
  the process stays within campus control except when the campus is unable to manage the process in a timely way.
- The establishment of a timeline with specific benchmarks earlier in the disciplinary process, by specifying that initial assessments should be completed within 30 business days, investigations and investigation reports should be completed within 120 business days, and disciplinary charges should be filed within 40 business days of receipt of the investigation outcome by the Chancellor or Chancellor's designee, unless diWerent timelines are required by applicable policies or campus procedures (e.g., Sexual Violence/Sexual Harassment) or a timeline is extended for good cause, as defined in Senate Bylaw 336 and incorporated into the amended APM - 015.
- The revision of APM - 015 to align hearing timelines with Senate Bylaw 336, by requiring that a Privilege and Tenure hearing commence no later than 60 calendar days from the filing of disciplinary charges with the P&T Committee, unless extended for good cause, replacing the prior 90-day requirement tied to the date of the notice of intent.
- Clarifying hearing committee appointment timelines, by requiring appointment of the hearing committee chair within 14 calendar days of receipt of disciplinary charges and appointment of the full hearing committee no later than 50 calendar days from the date charges are filed.

Chair Palazoglu noted that additional Senate-administration work will continue to establish further statewide guidelines to identify policy violations in expressive activity cases. These guidelines will undergo the usual 90-day systemwide review before being brought to the Assembly for approval.

ACTION: The Assembly approved the revisions to APM - 015 and 016 by roll-call vote (47 in favor, 2 opposed, 2 abstentions).

Unfinished Business ***(3:15 - 4:30 pm)***

1. Resolution Concerning the Disclosure of Names of Faculty, Students, and StaS The discussions on this issue continue and no final version has been brought up for a vote yet. We hope to report on the outcomes at our next Division Meeting.

Received
6/15/25

To Division
12/8/25

UC RIVERSIDE

Academic Senate

Professor First Last
Division Chair

EXECUTIVE COUNCIL
Kenneth Barish, Chair

December 8, 2025

To: Riverside Division

From: Ken Barish, Chair, Executive Council

RE: Proposed Transfer of the CNAS Microbiology Undergraduate Program to the CNAS Department of Microbiology and Plant Pathology

Executive Council, with no additional comments, endorsed the Proposed Transfer of the CNAS Microbiology Undergraduate Program to the CNAS Department of Microbiology and Plant Pathology for inclusion on the Winter 2026 Division meeting agenda.

From: **Elizabeth Watkins** <elizabeth.watkins@ucr.edu>
Date: Fri, Oct 24, 2025 at 2:00 PM
Subject: Re: [Request] Charge for a Special Review Committee - Transfer of the Microbiology Undergraduate Program to the Department of Microbiology and Plant Pathology
To: Cherysa Cortez <cherysa.cortez@ucr.edu>
Cc: Peter W Atkinson <peter.atkinson@ucr.edu>, Kenneth Barish <barish@ucr.edu>, Corinna D Corpuz <corinna.d.corpuz@ucr.edu>, Jennifer V Markovski <jennifer.markovski@ucr.edu>, Aneesah Kelley-Henry <aneesah.kelleyhenry@ucr.edu>, Cherysa Cortez <cherysac@ucr.edu>

Dear Ken,
I have reviewed all of the materials related to the Proposed Transfer of the CNAS Microbiology Undergraduate Program to the CNAS Department of Microbiology and Plant Pathology. I concur with the findings of the Special Review committee and with the recommendations of the CNAS Dean, the MPP department, and my colleagues on the Senate committees that reviewed this proposal to move forward with the transfer. I have no additional comments.
Sincerely,
Liz

Elizabeth Watkins, PhD
Provost and Executive Vice Chancellor
Professor of History
University of California, Riverside
elizabeth.watkins@ucr.edu

Executive Assistant:
Corinna Corpuz
951.827.1129 | corinna.corpuz@ucr.edu

On Wed, Oct 22, 2025 at 4:01 PM Cherysa Cortez <cherysa.cortez@ucr.edu> wrote:
Dear Provost Watkins,

On behalf of Senate Chair Barish, I've attached his letter informing you that the Special Review Committee convened about the **Proposed Transfer of the CNAS Microbiology Undergraduate Program to the CNAS Department of Microbiology and Plant Pathology** has submitted their final report; and Senate committees have reviewed and commented on it. Per UCR Bylaw Appendix 7, campus administration is now to review and provide comments on the proposed transfer and these comments will be included with the attached materials in the further review of the proposal.

Attached to Ken's letter is the proposal, the report of the Special Review Committee,

and response memos from the Committees on Academic Personnel, Educational Policy, Planning and Budget, and the Graduate Council.

Please submit your comments regarding the proposal by November 20, 2025. Should you have questions, please let us know.

Best,

Cherysa Cortez

UC RIVERSIDE

Academic Senate

Professor Kenneth Barish
Division Chair

October 22, 2025

To: Elizabeth Watkins, Provost and Executive Vice Chancellor

Re: Proposed Transfer of the CNAS Microbiology Undergraduate Program to the CNAS Department of Microbiology and Plant Pathology

Dear Provost Watkins,

The Special Review Committee convened about the *Proposed Transfer of the CNAS Microbiology Undergraduate Program to the CNAS Department of Microbiology and Plant Pathology* has submitted their final report and Senate committees have reviewed and commented on it. Per UCR Bylaw Appendix 7[1] campus administration is now to review and provide comments on the proposed transfer and these comments will be included with the attached materials in the further review of the proposal.

Included here the proposal, the report of the Special Review Committee, and response memos from the Committees on Academic Personnel, Educational Policy, Planning and Budget, and the Graduate Council.

Kindly submit your comments regarding the proposal to me (cc Senate Director Cherysa Cortez) by November 20, 2025. Should you have questions, please let us know.

Best regards,

Ken Barish, Senate Chair

Cc: CNAS Dean Atkinson
Senate Director Cortez
Senate Analyst Kelley-Henry
Executive Analyst Corpuz
Executive Assistant Markovski

Attachments

[1] Appendix 7 states that the Executive Vice Chancellor shall submit the report of the Special Committee to his/her Student Committee on Budget and Academic Planning for its review and recommendation. Per former PEVC C. Larive, no such student committee exists. Therefore, while the Appendix is under revision, the Administration has requested, and the Academic Senate is allowing a standing exception to this portion of the Appendix.

UC RIVERSIDE Academic Senate

June 12, 2025

To: Kenneth Barish, Chair
Riverside Division Academic Senate

From: Special Review Committee for the Proposed Transfer of CNAS Microbiology Undergraduate Program to the CNAS Department Microbiology & Plant Pathology

Chair, Richard J. Debus, Professor of Biochemistry, CNAS
Reza Abbaschian, Distinguished Professor, Winston Chung Endowed Professor in Sustainability, Department of Mechanical Engineering, BCOE
Amy Litt, Associate Professor and Plant Evolution & Developmental Biologist, Department of Botany and Plant Sciences, CNAS
David D. Lo, Distinguished Professor of Biomedical Sciences, SOM
Chikako Takeshita, Associate Professor of Society, Environment, and Health Equity, CHASS

Re: Special Review Committee for the Proposed Transfer of CNAS Microbiology Undergraduate Program to the CNAS Department Microbiology & Plant Pathology

Introduction

Per Appendix 7 (5a) of the Academic Senate Bylaws, Special Review Committee (SRC) was entrusted with the following charge:

1. Evaluate the rationale and justification for the proposed program move
2. Comment on whether the CNAS Microbiology and Plant Pathology department's infrastructure is adequate to accommodate the move
3. Consider the effect of the proposal (if approved) on other units within CNAS and on campus
4. Discuss budgetary implications

Each of these items is discussed below.

1. Evaluate the rationale and justification for the proposed program move.

The committee finds the rationale and justification for the move to be acceptable.

The Microbiology Undergraduate Interdepartmental Program has enrolled approximately 56 new students each Fall since 2021 (as of May 13, 2025, the Program's SIRs for Fall 2025 were 62 first year students and 8 Transfer students). Since its inception in 2011, the Program has been run by MPP faculty. Its required upper division courses have been taught exclusively by MPP faculty, the majority of its upper division elective courses have been created and taught by MPP faculty, the Program's director and Lead Faculty Advisor positions have been filled exclusively

by MPP faculty, and the program has been administered by MPP and the BMPN Administrative Unit. In addition, the MPP department has hired all necessary lecturers and Associate In's, has appointed and supervised the TAs for MCBL courses, and secured, organized, and equipped renovated laboratory space in Pierce Hall for expanded teaching of MCBL courses. Efforts to improve the program historically have involved only MPP faculty. Nevertheless, being an Interdepartmental Program, the Microbiology Program has a three-member Steering Committee that includes one faculty member who is not a member of MPP. The Steering Committee typically meets once every other year, when a vote is needed on program changes. Moving the program into the MPP Department would simplify the administration of the major and would benefit students by facilitating more frequent discussion of curricular issues and learning objectives at faculty meetings. Moving the Microbiology Major into the MPP department would also forestall future problems that have been observed in other Interdepartmental programs: the MPP department chair would be able to assign teaching, MPP faculty would feel more engaged with the major because developing/teaching courses would count as department-level service, and MPP faculty would be more inclined to mentor MCBL undergraduate students.

The program move is supported almost unanimously by the MPP faculty and by the faculty in the Microbiology Undergraduate Interdepartmental Program. Large majorities of faculty participated in the email voting that took place in the Interdepartmental Program and separately in the MPP Department. No faculty member voted against the move and only a few faculty members were unavailable to vote. The current Director of the Program and the current Chair of MPP also support the proposed mover.

2. Comment on whether the CNAS Microbiology and Plant Pathology department's infrastructure is adequate to accommodate the move.

Since its inception in 2011, the Microbiology Undergraduate Interdepartmental Program has been administered by the MPP Department and the BMPN Administrative unit. This would remain the same. Consequently, the MPP Department's infrastructure is adequate to accommodate the proposed move.

3. Consider the effect of the proposal (if approved) on other units within CNAS and on campus.

Since its inception in 2011, the required upper division courses of Microbiology Undergraduate Interdepartmental Program have been taught exclusively by MPP faculty, the majority of its upper division elective courses have been created and taught by MPP faculty, the Program's director and Lead Faculty Advisor positions have been filled exclusively by MPP faculty, and the program has been administered by MPP and the BMPN Administrative Unit. In addition, the MPP department has hired all necessary lecturers and Associate In's and has appointed and supervised the TAs for MCBL courses. There would be no change in these activities. Therefore, there would be no effect on other units within CNAS or on campus.

4. Discuss budgetary implications.

Since its inception in 2011, the Microbiology Undergraduate Interdepartmental Program has been administered by MPP and the BMPN Administrative Unit. This would not change. Consequently, there would be no budgetary implications.

Received 4/10/24 Academic Senate

UC RIVERSIDE

College of Natural and Agricultural Sciences
Office of the Dean
900 University Avenue
2315 Olmsted
Riverside, CA 92521-0127

Proposal to transfer the CNAS Microbiology Undergraduate Program to the CNAS Department Microbiology and Plant Pathology

March 3, 2025

Proposal for a charge for the Special Review Committee

Per Appendix 7 (5a) of the Academic Senate Bylaws dealing with procedures for transfer, consolidation, disestablishment, or discontinuance of an academic program, or unit, we propose the following charge for the Special Review Committee:

1. Evaluate the rationale and justification for the proposed program move
2. Comment on whether the CNAS Microbiology and Plant Pathology department's infrastructure is adequate to accommodate the move
3. Consider the effect of the proposal (if approved) on other units within CNAS and on campus
4. Discuss budgetary implications
5. Provide a report to the Senate Executive Council dated 7 weeks from the issuance of the charge

DocuSigned by:
Elizabeth Watkins 3/11/2025 | 7:41 AM PDT
34DF04C27FAD4C0...

Elizabeth Watkins
Provost and Executive Vice Chancellor

Signed by:
Peter Atkinson 3/11/2025 | 6:25 AM PDT
44DCE611D628439...

Peter W. Atkinson
Dean, CNAS

UNIVERSITY OF CALIFORNIA, RIVERSIDE

BERKELEY • DAVIS • IRVINE • LOS ANGELES • RIVERSIDE • SAN DIEGO • SAN FRANCISCO SANTA BARBARA • SANTA CRUZ

Date: November 2, 2024

To: UCR Academic Senate Committees

From: James Borneman, Director, Microbiology Undergraduate Major

RE: Moving Microbiology Undergraduate Major to Dept. Microbiology & Plant Pathology

The faculty of the Microbiology Undergraduate Major considered a proposal to move the program from an interdepartmental major to a departmental major housed in the Department of Microbiology and Plant Pathology. The faculty thought students would be better served by a departmentally-housed major because the monthly faculty meetings would facilitate more frequent discussions of many important topics including the annual student learning assessments, coordinating curriculum among the courses, and possible new courses that would benefit the students.

A vote of the faculty of the Microbiology Undergraduate Major to move the major to a departmental major housed in the Department of Microbiology and Plant Pathology was taken by email. A large majority of faculty voted, and all who voted were in favor, with 20 In Favor, 0 Against and 3 Not Voting.

Based on this positive vote, we request that the appropriate Academic Senate Committees consider our proposal to move the Microbiology Undergraduate Major to a departmental major housed in the Department of Microbiology and Plant Pathology. We note that the department would welcome involvement of non-departmental faculty in the major.

Sincerely,

James Borneman, Ph.D. Professor
Department of Microbiology and Plant Pathology
Director, Microbiology Major
University of California, Riverside, CA 92521
Phone: 951-827-3584, Fax: 951-827-4294, Email: borneman@ucr.edu

R'Mail powered by Google

Aneesah Kelley-Henry <aneesahk@ucr.edu>

Special Review Committee for the Proposed Transfer of Microbiology to Microbiology & Plant Pathology

1 message

Richard Debus <debusrj@ucr.edu> Thu, May 8, 2025 at 10:15 PM
To: katherine.borkovich@ucr.edu, james.borneman@ucr.edu
Cc: aneesah.kelleyhenry@ucr.edu

You don't often get email from debusrj@ucr.edu. Learn why this is important

Dear James and Kathy,

I have been elected Chair of the Special Review Committee that was appointed by the Academic Senate to evaluate the proposal to transfer the CNAS Microbiology Undergraduate Program to the CNAS Department Microbiology and Plant Pathology.

The committee's charge is to:

1. Evaluate the rationale and justification for the proposed program move

2. Comment on whether the CNAS Microbiology and Plant Pathology department's infrastructure is adequate to accommodate the move

3. Consider the effect of the proposal (if approved) on other units within CNAS and on campus

4. Discuss budgetary implications

5. Provide a report to the Senate Executive Council dated 7 weeks from the issuance of the charge

However, committee has been provided with nothing other than the brief letter from Kathy dated October 30, 2024 and the brief letter from James dated November 2, 2024. The committee feels strongly that we need more information to conduct our work. Is there a formal proposal that you can send to me that addresses some of these issues? Has the Microbiology major undergone an Undergraduate Program Review? If so, material in this review, especially the program's Self-Statement, would be very helpful to our current committee.

Many thanks!

Best Wishes,

Rick Debus, Chair
Special Review Committee

To: Special Review Committee to evaluate the proposal to transfer the CNAS Microbiology Undergraduate Program to the CNAS Department Microbiology and Plant Pathology

From: James Borneman (Director Microbiology Major) & Kathy Borkovich (Chair MPP)

Date: 2025.5.29

Re: Response to a Request for More Information

Dear Chair Debus and Special Review Committee Members

Below is the request for more information that we received concerning the proposed transfer of the Microbiology Undergraduate Program to the Department of Microbiology and Plant Pathology. Below, we provide our responses to these requests in blue text.

The committee's charge is to:

1. Evaluate the rationale and justification for the proposed program move

    Please see the attached proposal titled, Proposal to Transfer of MCBL Undergraduate Program to MPP -- 2025.5.29

2. Comment on whether the CNAS Microbiology and Plant Pathology department's infrastructure is adequate to accommodate the move

    Since its inception in 2011, the Microbiology Undergraduate Program has been administered by MPP and the BMPN Administrative Unit. There would therefore be no move.

3. Consider the effect of the proposal (if approved) on other units within CNAS and on campus

    Since its inception in 2011, all of the core courses for the Microbiology Undergraduate Program and the majority of the upper-division elective courses have been taught by MPP faculty. The Director and Lead Faculty Advisor positions have always been filled by MPP faculty. All efforts to improve the program have involved only MPP faculty. There would therefore be no effects on other units within CNAS or the campus.

4. Discuss budgetary implications

    Since its inception in 2011, the Microbiology Undergraduate Program has been administered by MPP and the BMPN Administrative Unit. There would therefore be no budgetary implications.

5. Provide a report to the Senate Executive Council dated 7 weeks from the issuance of the charge

    This document and the attachments are the report.

However, committee has been provided with nothing other than the brief letter from Kathy dated October 30, 2024 and the brief letter from James dated November 2, 2024. The committee feels strongly that we need more information to conduct our work.

Is there a formal proposal that you can send to me that addresses some of these issues?

> Please see the attached proposal titled, Proposal to Transfer of MCBL Undergraduate Program to MPP -- 2025.5.29

Has the Microbiology major undergone an Undergraduate Program Review?

> It was reviewed in 2017.

If so, material in this review, especially the program's Self-Statement, would be very helpful to our current committee.

> Please find attached the Self-Study from that program review - see fil titled, Self Study - MCBL - Admin & Program

Proposal to Transfer the Interdepartmental Microbiology Undergraduate Program to the Microbiology and Plant Pathology Department

1. Rationale for Transfer

The Interdepartmental Microbiology Undergraduate Program was established in 2011. Since then:

1. Its core courses have been taught only by faculty in the Department of Microbiology & Plant Pathology (MPP).
2. The majority of its upper-division MCBL electives have been created and taught by MPP faculty.
3. The Director and Lead Faculty Advisor positions have been filled by MPP faculty.
4. All efforts to improve the program have involved only MPP faculty.
5. The program has been financially administered by MPP and the BMPN Administrative Unit.
6. The program has been financed by MPP and student course fees.
7. When necessary, MPP has hired all lecturers and Associate-Ins to fill gaps in teaching.
8. MPP has appointed and supervised TAs for MCBL courses.
9. MPP secured the renovated lab in Pierce Hall for expanded teaching of MCBL courses.
10. MPP faculty organized, ordered equipment and set up the new teaching lab in Pierce Hall.
11. MPP hired a laboratory assistant for MCBL laboratory courses in Pierce Hall.

The transfer of the Interdepartmental Microbiology Undergraduate Program to MPP would therefore involve no changes except the one described in Sections 3 and 4 below. The rationale for making this transfer is to align the ownership of the program with the department that bears the educational, financial and organizational responsibility for the program.

2. Votes for Transfer

A vote of the faculty in the Interdepartmental Microbiology Undergraduate Program to move the program to a departmental major housed in MPP was taken by email. A large majority of faculty voted, and all who voted were in favor, with 20 In Favor, 0 Against and 3 Not Voting. See letter from James Borneman (Director of Microbiology Program) dated November 2, 2024.

A vote of MPP faculty to move the Interdepartmental Microbiology Undergraduate Program to a departmental major housed in MPP was taken by email. A large majority of faculty voted, and all who voted were in favor, with 21 In Favor, 0 Against and 3 Not Voting. See letter from Kathy Borkovich (Chair of MPP) dated October 30, 2024.

3. Current Administration of the Interdepartmental Program

As described in Section 1, the Interdepartmental Microbiology Undergraduate Program has always been run by MPP faculty and the BMPN Administrative Unit. We note that the Interdepartmental Microbiology Undergraduate Program has also always had a three-member steering committee, which has included one faculty member who is not a member of MPP. However, that committee only convenes when a vote is needed on program changes, which has typically been approximately every other year.

4. Proposed Administration of the Program by MPP

We propose to keep the administration and leadership the same as it currently is, except the steering committee will no longer include a non-MPP faculty member.

5. List of MPP Faculty

1. James Adaskaveg, Professor
2. Emma Aronson, Professor
3. Katherine Borkovich, Professor
4. James Borneman, Professor
5. Sonali Chaturvedi, Assistant Professor
6. Patrick Degnan, Assistant Professor
7. Shou-Wei Ding, Distinguished Professor
8. Ahmed El-Moghazy, Assistant CE Specialist
9. Emma Gachomo, Assistant Professor
10. Sydney Glassman, Associate Professor
11. Rong Hai, Associate Professor
12. Ansel Hsiao, Associate Professor
13. Hailing Jin, Professor
14. Howard Judelson, Professor
15. Fatemeh Khodadadi, Assistant CE Specialist
16. Patricia Manosalva, Associate Professor
17. Juliet Morrison, Assistant Professor
18. James Ng, Associate Professor
19. Olakunle Olawole, Assistant Professor
20. Alexander Putman, Assistant CE Specialist
21. Caroline Roper, Professor
22. Jason Rothman, Assistant Professor of Teaching
23. Jason Stajich, Professor
24. Georgios Vidalakis, Professor & CE Specialist

6. List of BMPN Staff

1. Bernasconi, Carla	Purchasing Assistant & Travel Coordinator
2. Brown, Debbie	Financial Services Analyst, 2
3. Callecod, Kylee	Purchasing Assistant & Travel Coordinator
4. Farias, Phil	Procurement Supervisor
5. Grawe, Lacey	Events Coordinator & Department Chair Assistant
6. Liyanage, Jessica	Student Assistant
7. Morgando, Christine	Financial Administrative Officer
8. Quintana, Lorena	Purchasing Assistant & Travel Coordinator
9. Ryan, Rebecca	Research Administrator, 3
10. Seedfeldt, Erinn	Research Administrator, 3
11. Ulrich, Matthew	Facilities Assistant
12. Under Recruitment	Research Administrator, 2
13. Under Recruitment,	Temporarily supported by Phil Farias (Procurement Supervisor)
14. Vanta, Sarah	Financial Operations Manager
15. Viramontes, Joey	Receiving Room Assistant
16. Westbrook, Jeanette	Procurement Analyst

7. Undergraduate Academic Advising Center Advisor

Mark Taylor

SELF STUDY OF THE MICROBIOLOGY MAJOR

I. Administrative Structure

The Dean of the College of Natural and Agricultural Sciences (CNAS) oversees all of the departments, department-based undergraduate majors and several interdepartmental majors, including the Microbiology Major. Because the resources and administration in the college are channeled through departments, and because the Microbiology Major is multi-departmental, the Chairperson from the Department of Plant Pathology and Microbiology represents the major at the appropriate college meetings. This ensures that (i) the major has parity with department-based life sciences majors at the college level, (ii) the major has the authority to carry out its mission, (iii) information is transferred between CNAS and the major, and (iv) there is coordination of teaching assignments for the major among the departments.

The Microbiology Major is governed by a Steering Committee and the Participating Faculty Members. The major endeavors to support a culture of open, two-way communication between the Steering Committee and the Participating Faculty Members.

Steering Committee: The Steering Committee is comprised of three faculty members, representing a minimum of two academic departments. One committee member serves as the Lead Faculty Advisor, who is responsible for mentoring duties such as career guidance. The Chairperson from the Department of Plant Pathology and Microbiology also serves in an *ex officio* capacity to ensure proper representation in the college (see above); this person has all of the rights that the other committee members have. The committee's responsibilities include periodic evaluation of the curriculum, handling of appeals and exceptions and recruitment of faculty advisors. The Steering Committee seeks input from the Participating Faculty Members when appropriate. The Steering Committee may set up other sub-committees as needed. The Steering Committee may solicit faculty members to join the major, and it may also remove non-active members from this list.

Participating Faculty Members: These participants were initially identified through a college-wide poll that enabled faculty members to join the major. To continue as a Participating Faculty Member, at least one of the following is required: serving as an instructor in one of the upper-division science courses satisfying a requirement of the major, serving as a faculty advisor to undergraduates in the Microbiology Major, serving as a member on any Microbiology Major committee, or hosting an undergraduate performing microbiological research in their lab. Faculty members can also self-nominate to become a Participating Faculty Member. Participating Faculty Members can communicate suggestions or concerns to the Steering Committee at anytime. Such input is considered and acted on (if appropriate) by the Steering Committee in a timely manner. Current members of the steering committee are:

Role	Name	Department	Email
Chair and Lead Faculty Advisor	James Borneman	Plant Pathology & Microbiology	borneman@ucr.edu
Member 1	Emma Wilson	Biomedical Sciences	emma.wilson@ucr.edu
Member 2	Katherine Borkovich	Plant Pathology & Microbiology	katherine.borkovich@ucr.edu

CNAS Undergraduate Academic Advising Center: The major utilizes the Professional Academic Advisors at this college-based advising center.

II. Goals and Description of the Microbiology Major

Educational Philosophy and Vision: The mission of the Microbiology Major is to train students in Microbiology using a curriculum designed to allow students to prepare for a broad range of research, educational, policy and professional careers encompassed by the discipline, and to allow students to be competitive for careers after graduating from UCR. Students are educated in a myriad of subdisciplines in microbiology including human and animal pathogenesis, molecular genetics, physiology, environmental sciences, plant pathology, biotechnology, and epidemiology, among others. Students are expected to both demonstrate and retain an understanding of fundamental microbiological principles. Students are also expected to develop the ability to apply (i) critical thinking skills, (ii) technical laboratory skills and, (iii) analytical and computational skills, as well as develop the ability to clearly communicate scientific ideas in both written and oral formats.

Perceived Strengths and Weakness of the Major: We believe that the greatest strength of the Microbiology Major is its Capstone Course: *Experimental Microbiology* (MCBL 125). This course guides students through the process of performing experimental research in a microbiology laboratory. Students acquire skills in formulating hypotheses, designing experiments, performing laboratory experiments, analyzing data as well as preparing and presenting the results of these efforts in written and oral formats. Our most successful students in this course have become authors on peer-reviewed scientific publications. In addition, our graduates have obtained higher salaries in their first jobs because of the skills and experience that they have acquired from this course (personal communications with our students). Furthermore, students in this course independently discovered a new functional capability of Neurospora, which became the foundation of a recent NSF grant proposal, which, if funded will further support undergraduate research (see Biosketch for Kathy Borkovich in Appendix I).

We believe that the primary weakness of the Microbiology Major is the relatively small number of upper-division courses that are offered. This is due to the relatively small number of Participating Faculty Members in our major and because these faculty are members of several departments, and therefore have other department-based teaching responsibilities.

Recruitment and Outreach: We participate in all of our college-based recruitment activities including Discovery Day, Highlander Day and others. We also communicate with admitted students via phone calls and emails to encourage them to attend UCR. Students in our major are also invited to a welcome reception at the beginning of fall quarter. We are also engaged in outreach to the general public and local schools via presentations, demonstrations, hands-on activities and judging science fair projects (see the Faculty Biosketches in Appendix I for more details).

Key Changes to the Major Since its Last Review: This is the first review of the Microbiology Major.

Issues the Major Wants to Raise that Would be Helpful to the Review Committee: We believe that the Microbiology Major would be improved by (i) hiring additional Microbiology faculty so that we can teach a wider array of upper-division courses and by (i) having access to additional instructional laboratory space so that we can accommodate the increasing demand for our Capstone Course (MCBL 125).

Section II Addenda Including Faculty/Student Ratios, Structure of Degrees, Class Sizes, and Other Items: See Appendix II.

III. Learning Outcomes and Assessment Results

Western Association of Schools and Colleges (WASC) Learning Outcome Competencies and the Learning Outcomes for the Microbiology Major: The WASC learning outcomes are written and oral communication, quantitative reasoning, critical thinking, and information literacy. The learning outcomes for the Microbiology Major address all of the WASC learning outcomes, primarily through its Capstone Course (MCBL 125). The Microbiology Major's six learning outcomes are:

Learning Outcome 1: Students demonstrate the ability to apply critical thinking skills.

Learning Outcome 2: Students demonstrate the ability to communicate scientific ideas clearly in written format.

Learning Outcome 3: Students demonstrate the ability to communicate scientific ideas clearly in oral format.

Learning Outcome 4: Students demonstrate the ability to apply technical laboratory skills.

Learning Outcome 5: Students demonstrate the ability to apply analytical and computational skills.

Learning Outcome 6: Students both demonstrate and retain an understanding of fundamental microbiological principles.

To see how the learning outcomes of the Microbiology Major address the WASC learning outcomes, please see Appendix III, which is our Learning Outcomes Assessment Report from the 2015-2016 Academic Year.

IV. Student Data

Summaries of the Last Five Academic Years: See Appendix IV.

Financial Support Including Extramural Grants, Academic And Research Fellowships, And Financial Aid: See Appendix V.

Advising, Mentoring and Career Development: Student advising is performed by Professional Academic Advisors at the CNAS Undergraduate Academic Advising Center. This advising includes assisting students in coordinating their coursework and finding resources such as tutoring and career counseling. Student mentoring is performed by faculty including the Lead Faculty Advisor, who provides services such as career guidance. Additional preparation for specific career paths is provided by organizations such as the UCR Career Center, the Health Professions Advising Center and the Science and Math Initiative Program (K12 teaching careers). Additional mentoring is providing by faculty who host students in their labs to perform research (see Faculty Biosketches in Appendix I for more details). Finally, all of our students are encouraged to take NASC 093, *Freshman Advising Seminar in the Natural and Agricultural Sciences*, their first quarter at UCR. This course provides students with information on curriculum planning, career options and goals in the sciences, opportunities for undergraduate research, development of learning and study skills, ethics in research and education, and an introduction to the faculty and professional academic advisors.

Undergraduate Research or Other Scholarly Activity with Information on Presentations and Publications: This information is provided in the Faculty Biosketches (see Appendix I).

V. Instructional Facilities

Classrooms: Our campus utilizes a centralized system for assigning classroom space for courses.

Instructional Laboratories: The Microbiology Major utilizes two instructional laboratories to teach our two laboratory courses: MCBL 121L and MCBL 125. MCBL 121L is taught in Spieth 1125 (max of 24 students/section), which is well equipped for microbiology experimentation. Materials for this course are prepared and setup by the Lab Prep Staff from the Biology Department. MCBL 125 is taught in University Laboratory Building 104, in two rooms with state-of-the art wet-lab and computer facilities (max of 28 students/section). Both instructional laboratories contain the items described in the Instructional Technology section, below.

Information Resources such as Library and Computer Resources: Our students have access to several libraries including the Orbach Science Library among others. More importantly, the students have access to the complete University of California online library resources, and can access these resources off campus via a secure Internet connection. Our Student Computer Services maintains seven public computer labs with approximately 170 computers (Mac and Windows) available for academic use by all UCR students, and which are open approximately 160 hours per week.

Instructional Technology in the Classroom and Teaching Laboratory: Our classrooms and laboratories are equipped with modern instructional technology listed below.

Course Management System (iLearn): Allows the electronic (web) dissemination of information relating to a particular course: this can include schedules, calendars, syllabus, etc. It also allows e-mail access to all students in a course and provides a forum for on-line interactions (discussion boards, etc.). The system also provides assessment tools and grading functionality, including SafeAssign, which is a software system enabling plagiarism assessment.

Course Materials System (iLearn): Provides a mechanism to distribute electronic (web) materials to students. This includes PowerPoint, digital video, digital images, digital audio, etc. Importantly, the Course Materials System includes the infrastructure to store, catalog, and distributed these digital materials.

Wireless Network: Equips students with a widely available method of digitally accessing the Course Materials and Course Management system.

Classroom Technology: Provides faculty and instructors access to appropriately configured classrooms containing (at a minimum) access to the campus network, effective digital projection system, and multimedia playback system. Some of our classrooms are able to use clickers (known also as Personal Response Systems or PRS), which allow real-time interactions between the instructor and their students.

Laboratory Technology: See Instructional Laboratories section above.

Statement of Future Needs/Requirements: The number of Freshmen in the Microbiology major nearly doubled in Fall 2016. As enrollment continues to increase, we will need to teach more sections of our Capstone Course (MCBL 125). To accomplish this, we will need additional laboratory space with capabilities similar to the one we currently use (University Laboratory Building 104). We also will require the continued support of the Lab Prep Staff from the Biology Department for MCBL 121L and new support for MCBL 125, due to the increase in number of majors.

VI. Institutional Support

Staff Personnel Allocations for the Last Three Years: The Microbiology Major teaches two laboratory courses (MCBL 121L and MCBL 125) that require personnel. Materials for the MCBL 121L course are prepared and setup by the Lab Prep Staff from the Biology Department, where at least one person from this staff is dedicated to the preparation of the materials required for this course. Materials for the MCBL 125 course are currently prepared by the instructor and a graduate teaching assistant. Student advising is performed by one Professional Academic Advisor from the CNAS Undergraduate Academic Advising Center, who is shared by several majors.

TA Allocations for the Past Three Years: The Microbiology Major is provided TAs for five of its courses. For MCBL 121, we are provided 2 full-time (FT) TAs fall quarter, 1.5 FT TAs winter quarter and 1 FT TA spring quarter. For MCBL 121L, we are provided 5 FT TAs winter quarter and 4 FT TAs spring quarter. For MCBL 123, we are provided 1 FT TA spring quarter. For MCBL 124, we are provided 0.5 FT TA winter quarter. For MCBL 125, we are provided 1 FT TA spring quarter. Resources for these positions were: 2013-14, $161,934; 2014-15, $180,810; 2015-2016, $187,967.

Institutional Services: UCR provides numerous services for our students, including advising from Professional Academic Advisors at the CNAS Undergraduate Academic Advising Center. Preparation for specific career paths is provided by organizations such as the UCR Career Center, the Health Professions Advising Center and the Science and Math Initiative Program. UCR's Academic Resource Center provides programs and resources to promote the development of essential academic study skills, foster academic excellence and cultivate an environment of learning beyond the classroom. UCR's Student Success Programs gives students opportunities to implement their knowledge beyond the classroom. Programs like the Student Mini-grants, Chancellor's Research Fellows, Internships, and Summer Study Abroad help students apply their classroom knowledge to real world issues; in these programs, students also use critical thinking and analytical skills as they work to solve problems and contribute new knowledge to their discipline. The Undergraduate Research Journal and Undergraduate Research Symposium foster and promote faculty-mentored research on campus. UCR's University Honors is designed for students who have demonstrated through their own high achievement that they value intellectual challenges and want to be a part of an innovative, diverse, and demanding learning community. UCR's University Writing Program has programs and resources to develop core competencies in reading, writing, and speaking that are devoted to critical analysis, complex reasoning, and responding to the writing and speaking of others.

VII. Faculty Data

Faculty Academic Biosketches: See Appendix I.

Faculty Grants that Impact the Microbiology Major Including Undergraduate Research: Kathy Borkovich is Co-PI on a funded NSF STEP grant with PI Michael McKibben (SL-CARE: Student learning communities and research engagement). This project is expanding the Learning Communities in our science college to include up to 80% of incoming undergraduates, purchasing equipment for teaching Dynamic Genome courses and providing some funding for TAs and an academic coordinator. Dr. Borkovich is also a Key Faculty on a recently-awarded HHMI Undergraduate Science Education grant to PI Susan Wessler for $2.4 million over 5 years (SALSA; Sustaining Academic Leadership for STEM Achievement). HHMI-SALSA will increase the number of sections of the Dynamic Genome course from 9 to 24/year over the next five years, allowing nearly 600 students to take the course. For more information, see Faculty Biosketches in Appendix I.

Three-Year Teaching Load Data: See Appendix VI.

Distribution of Faculty Among Sub-Disciplines or Area(s) of Specialty for Past 5 Years, Impact of this Distribution on the Microbiology Major and Recruitment Plans for the Future: The Microbiology Major currently has 28 Participating Faculty Members that work in the following broad areas of Microbiology: host-microbe interactions (22), fundamental research (28), applied research (15), agriculture (19), medicine (10) and the environment (5); the number of faculty members in each area are in parentheses and each faculty can be in more than one category. The types of organisms that are studied by our faculty members include: bacteria (11), fungi-oomycetes (9), protozoa (3), and viruses (5); the number of faculty members studying each organism type are in parentheses and each faculty can be in more than one category. For additional details, see the faculty Biosketches in Appendix I. Our future recruitment plans are to increase the total number of faculty members in the Microbiology Major to 50-60, enabling us to offer more upper-division electives for our students. These hires will be in areas that create a better balance among agricultural, medical and environmental researchers.

Microbiology & Plant Pathology
University of California, Riverside
900 University Avenue
Riverside, CA 92521-0001
katherine.borkovich@ucr.edu

Date: October 30, 2024

To: UCR Academic Senate Committees

From: Katherine Borkovich, Chair, Department of Microbiology and Plant Pathology Katherine Borkovich

RE: Movement of Undergraduate Microbiology Major to the Department of Microbiology and Plant Pathology

The faculty of the Department of Microbiology and Plant Pathology (MPP) considered a proposal brought forth by the faculty in the interdepartmental Microbiology major to move the major to MPP, largely to streamline administrative functions. This matter was discussed at an MPP faculty meeting on 09/30/2024. The general consensus was that this action was supported because MPP faculty are currently in charge of nearly all instruction and development of upper division courses, advising, administration and leadership of the major. Having the major in the MPP department will simplify administrative decisions for the major.

Based on the positive discussion during the meeting, a vote of the MPP faculty to move the major to MPP, and convert it to a departmentally based major, was taken by email. A large majority of faculty voted, and all who voted were in favor, with 21 In Favor, 0 Against and 3 Not Voting.

Based on this positive vote, we request that the move of the undergraduate Microbiology to MPP be considered by the appropriate Academic Senate Committees. Note that the department would welcome involvement of non-departmental faculty in the major if they are interested.

UC RIVERSIDE | UNIVERSITY OF CALIFORNIA College of Natural and Agricultural Sciences
Executive Committee

April 8th, 2025

TO: Kenneth N. Barish, Ph.D., Chair, Academic Senate, UCR Division

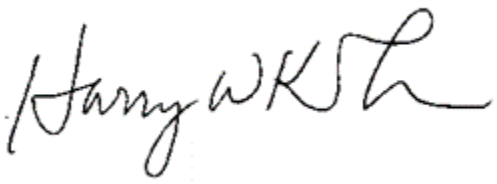
FROM: Harry Tom, Ph.D., Chair, Faculty Executive Committee, College of Natural and Agricultural Sciences

SUBJECT: Proposed Transfer of the Undergraduate Microbiology Program

Prof. Barish,

The CNAS Executive Committee has reviewed the proposal to transfer the undergraduate Microbiology program to the Department of Microbiology and Plant Pathology, has no objections, and supports the move.

Sincerely,



Harry Tom, Ph.D
Chair, Faculty Executive Committee, College of Natural and Agricultural Sciences

R'Mail powered by Google

Cherysa Cortez <cherysac@ucr.edu>

[HIGH PRIORITY] SRC Transfer of Microbiology Undergraduate Program to Dept of MPP Final Report

Richard Debus <debusrj@ucr.edu> Tue, Aug 12, 2025 at 11:51 AM
To: Cherysa Cortez <cherysa.cortez@ucr.edu>
Cc: Aneesah Kelley-Henry <aneesah.kelleyhenry@ucr.edu>, Cherysa Cortez <cherysac@ucr.edu>

Hi Cherysa,

The members of the Special Review Committee unanimously supported the proposed transfer. On the basis of his brief comment, it appears that the CNAS Dean is also in favor.

I am confident that the committee would not revise its recommendation/report on the basis of this comment from the Dean.

Best Wishes,

Rick Debus

From: Cherysa Cortez <cherysa.cortez@ucr.edu>
Sent: Tuesday, August 12, 2025 11:34 AM
To: Richard Debus <debusrj@ucr.edu>
Cc: Aneesah Kelley-Henry <aneesah.kelleyhenry@ucr.edu>; Cherysa Cortez <cherysac@ucr.edu>
Subject: Re: [HIGH PRIORITY] SRC Transfer of Microbiology Undergraduate Program to Dept of MPP Final Report

Dear Richard,

In review of the report and documents related to the proposed transfer of the Microbiology Undergraduate Program to the Department of Microbiology and Plant Pathology, the letter from the CNAS Dean is inadvertently missing. It was requested and not received in time for the Special Review Committee you chaired to include it in their review and deliberation. Prior to the SRC's first meeting and in response to the request for a letter, the CNAS Dean replied thusly:

Senate Request:

Subject: Proposed Transfer of the Undergraduate Microbiology Program

March 7, 2025

PETER ATKINSON, DEAN, COLLEGE OF NATURAL AND AGRICULTURAL SCIENCES

RE: Proposed Transfer of the Undergraduate Microbiology Program

We are in receipt of the attached proposal to transfer the undergraduate Microbiology program to the Department of Microbiology and Plant Pathology. Per Academic Senate Appendix 7 , this process seeks consultation with the dean.

Please review the attached documents and provide your letter by March 31, 2025.

The letter will be added to the proposal documents as part of the Academic Senate review process.

Many thanks,

Cherysa Cortez

Response from Dean Atkinson, April 11, 2025:

I can send a memo explaining my reasoning. This had been a chronic problem with these programs. I dealt with this as Life Sci Dean, and I see the integration of these programs into departments as inevitable unless we develop a better model for their financial viability.

Peter

Peter W. Atkinson, Ph.D.

Dean

College of Natural & Agricultural Sciences

We've followed up on this dean's letter and to date have not received it. Is the above sufficient for the SRC to review and decide if they would like to revise their final report?

Many thanks,

Cherysa Cortez

On Thu, Jun 12, 2025 at 3:12 PM Aneesah Kelley-Henry <aneesah.kelleyhenry@ucr.edu> wrote:

> Good Afternoon Ken and Cherysa,
>
> Please find attached the final report for the Special Review Committee for the Proposed Transfer of the CNAS Microbiology Undergraduate Program to the CNAS Department Microbiology & Plant Pathology. Please let me know if you need any additional information.

Thank you,

Aneesah

~~~~~~~~~~~~~~~~~~~~~~

Aneesah Kelley-Henry

Committee Analyst

Academic Senate Office

University of California, Riverside

231 University Office Building

Riverside, CA 92521

P: (951) 827-4784

F: (951) 827-5545
~~~~~~~~~~~~~~~~~~~~~~

R'Mail powered by Google

Cherysa Cortez <cherysac@ucr.edu>

Proposed Transfer of the Undergraduate Microbiology Program

Peter Atkinson <peter.atkinson@ucr.edu> Fri, Apr 11, 2025 at 9:02 AM
To: Cherysa P Cortez <cherysa.cortez@ucr.edu>
Cc: Peter W Atkinson <peter.atkinson@ucr.edu>, Jennifer V Markovski <jennifer.markovski@ucr.edu>

I can send a memo explaining my reasoning. This had been a chronic problem with these programs. I dealt with this as Life Sci Dean, and I see the integration of these programs into departments as inevitable unless we develop a better model for their financial viability.

Peter

Peter W. Atkinson, Ph.D.
Dean
College of Natural & Agricultural Sciences
2315 Olmsted Hall (Dean's Office)
2234A Genomics Building (Faculty Office)
University of California
Riverside, CA 92521, USA

Ph: 951-827-3101
e-mail: peter.atkinson@ucr.edu
https://atkinsonlabentm.ucr.edu/

Executive Assistant: Jennifer Markovski
(office) 951-827-4597

[Quoted text hidden]

UC RIVERSIDE Academic Senate

COMMITTEE ON ACADEMIC PERSONNEL

October 16, 2025

To: Kenneth Barish, Chair
Riverside Division Academic Senate

From: Shaun Bowler, Chair
Committee on Academic Personnel

Re: [Campus Review] Proposal: *Transfer of CNAS Microbiology Undergraduate Program to CNAS Department of Microbiology and Plant Pathology*

The Committee on Academic Personnel (CAP) has reviewed the proposal to move the undergraduate Microbiology program to the Department of Microbiology and Plant Pathology. CAP found no issues with the proposal, endorsing the proposed transfer.

UC RIVERSIDE Academic Senate

COMMITTEE ON EDUCATIONAL POLICY

October 3, 2025

To: Ken Barish, Chair
Riverside Division

From: Annie Ditta, Chair
Committee on Educational Policy

Re: Proposed Transfer of CNAS Microbiology Undergraduate Program to the CNAS Department of Microbiology and Plant Pathology

The Committee on Educational Policy (CEP) reviewed the proposed transfer of the CNAS Microbiology undergraduate program to the CNAS Department of Microbiology and Plant Pathology at their October 3, 2025 meeting and voted to support the proposal.

UC RIVERSIDE Academic Senate

GRADUATE COUNCIL

October 16, 2025

To: Kenneth Barish, Chair
Riverside Division

From: Viji Santhakumar, Chair
Graduate Council

RE: [Campus Review] Proposal: Transfer of CNAS Microbiology Undergraduate Program to the CNAS Department of Microbiology and Plant Pathology

Graduate Council reviewed and discussed the proposal to transfer the Microbiology Undergraduate Program to the Department of Microbiology and Plant Pathology at their October 16, 2025 meeting. Graduate Council approved the proposal and transfer of the program.

UC RIVERSIDE

Academic Senate

PLANNING AND BUDGET

October 17, 2025

To: Kenneth Barish, Chair
Riverside Division

From: David Oglesby, Chair
Committee on Planning and Budget

Re: **[Campus Review] Proposal:** ***Transfer of CNAS Microbiology Undergraduate Program to the CNAS Department of Microbiology and Plant Pathology***

The Committee on Planning and Budget (CPB) reviewed the proposal to transfer the CNAS Microbiology Undergraduate Program to the CNAS Department of Microbiology and Plant Pathology. CPB did not see any budgetary implications to note for this proposal and is generally supportive of the transfer.

UC RIVERSIDE Academic Senate

COMMITTEE ON ACADEMIC PERSONNEL

October 16, 2025

To: Kenneth Barish, Chair
Riverside Division Academic Senate

From: Shaun Bowler, Chair
Committee on Academic Personnel

Re: [Campus Review] Proposal: *Transfer of CNAS Microbiology Undergraduate Program to CNAS Department of Microbiology and Plant Pathology*

The Committee on Academic Personnel (CAP) has reviewed the proposal to move the undergraduate Microbiology program to the Department of Microbiology and Plant Pathology. CAP found no issues with the proposal, endorsing the proposed transfer.

UC RIVERSIDE Academic Senate

COMMITTEE ON EDUCATIONAL POLICY

October 3, 2025

To: Ken Barish, Chair
Riverside Division

From: Annie Ditta, Chair
Committee on Educational Policy

Re: Proposed Transfer of CNAS Microbiology Undergraduate Program to the CNAS Department of Microbiology and Plant Pathology

The Committee on Educational Policy (CEP) reviewed the proposed transfer of the CNAS Microbiology undergraduate program to the CNAS Department of Microbiology and Plant Pathology at their October 3, 2025 meeting and voted to support the proposal.

UC RIVERSIDE Academic Senate

GRADUATE COUNCIL

October 16, 2025

To: Kenneth Barish, Chair
Riverside Division

From: Viji Santhakumar, Chair
Graduate Council

RE: [Campus Review] Proposal: Transfer of CNAS Microbiology Undergraduate Program to the CNAS Department of Microbiology and Plant Pathology

Graduate Council reviewed and discussed the proposal to transfer the Microbiology Undergraduate Program to the Department of Microbiology and Plant Pathology at their October 16, 2025 meeting. Graduate Council approved the proposal and transfer of the program.

UC RIVERSIDE Academic Senate

PLANNING AND BUDGET

October 17, 2025

To: Kenneth Barish, Chair
Riverside Division

From: David Oglesby, Chair
Committee on Planning and Budget

Re: **[Campus Review] Proposal:** ***Transfer of CNAS Microbiology Undergraduate Program to the CNAS Department of Microbiology and Plant Pathology***

The Committee on Planning and Budget (CPB) reviewed the proposal to transfer the CNAS Microbiology Undergraduate Program to the CNAS Department of Microbiology and Plant Pathology. CPB did not see any budgetary implications to note for this proposal and is generally supportive of the transfer.

UC RIVERSIDE UNIVERSITY OF CALIFORNIA

College of Natural and Agricultural Sciences
UC Division of Agriculture and Natural Resources
Agricultural Experiment Station and Cooperative Extension

Department of Botany and Plant Sciences-072
Riverside, CA 92521-0124

January 4, 2026

To: Kenneth N. Barish, Chair
Riverside Division of the Academic Senate

Re: BS in Genetics and Molecular Biotechnology

I am writing to request a vote for approval by the Academic Senate for the Bachelor of Science degree in Genetics and Molecular Biotechnology (GNBT) proposed herein.

The second round of Senate review was positive overall. The School of Public Policy suggested including alternatives to the PSYC 178 (Health Psychology) requirement for the Pre-Genetic Counseling Track. We have identified courses that would be likely to fulfill the entrance requirements for Genetic Counseling postgraduate programs we surveyed and that do not have too many prerequisites. We have now added PBPL 160 (Immigrant Health and Wellbeing), PBPL 167/SOC 167 (Medical Sociology), PBPL 127/SOC 127 (Sociological Determinants of Health), and PBPL 162 (Health in All Policies) as alternatives to PSYC 178.

Recent discussions with representatives from the Bioengineering (BIEN) department have resolved their concerns about the use of "Biotechnology" in the name of the proposed major. We now propose to name the program "Genetics and **Molecular** Biotechnology" and have removed the references to Bioengineering that were originally inserted into the catalog description in order to clarify differences in the scopes of GNBT and BIEN. This change has received enthusiastic approval from BIEN.

The revised proposal was approved by the BPSC department on Dec 30, 2025 (18 in favor of the proposed changes; 0 against; 1 abstention).

Please see the attached documents for the revised catalog description, a letter of support from BIEN, the revised degree proposal with changes tracked, and Appendices IV-VI that include comments collected and responded to in the prior rounds of review.

Sincerely,

Professor of Genetics
Botany and Plant Sciences
University of California, Riverside
david.nelson@ucr.edu
(951) 827-4397

Voice: 951-827-4619 · Fax: 951.827-4437 · WWW.PLANTBIOLOGY.UCR.EDU

R'Mail powered by Google

David Nelson <davidn@ucr.edu>

Enthusiastic approval from BIEN faculty about the proposed changes to GNBT major

William Grover <wgrover@ucr.edu> Wed, Nov 26, 2025 at 10:01 AM
To: Xiaoping Hu <xiaophu@ucr.edu>, david.nelson@ucr.edu, Chung-Hao Lee <chunghal@ucr.edu>, Sean Cutler <sean.cutler@ucr.edu>, Thomas Eulgem <teulgem@ucr.edu>

Hello Dave, Sean, and Thomas,

Thanks again for meeting with us yesterday. We shared with our colleagues your proposed changes to the planned major (specifically, removing mentions of the Bioengineering major from the catalog description, and changing the name of the major to “Genetics and Molecular Biotechnology”).

The consensus was that we enthusiastically support these changes, and we’re very grateful for your flexibility and willingness to accommodate our requests.

We’ll also communicate this information to the BCOE Executive Council so that they (and the Senate) know that we enthusiastically support this major once the two proposed changes are made.

Thank you!

—Will

William H. Grover
Associate Professor, Department of Bioengineering
University of California, Riverside
219 MS&E Building
900 University Ave.
Riverside, CA 92521
(951) 827-4311
groverlab.org

EXECUTIVE COMMITTEE
COLLEGE OF NATURAL AND AGRICULTURAL SCIENCES
REPORT TO THE RIVERSIDE DIVISION
~~MAY 20, 2025~~DECEMBER 19, 2025

To be adopted: Proposed new B.S. in Genetics and Molecular Biotechnology Major

PROPOSED:

Major

The B.S. in Genetics and Molecular Biotechnology major is designed to prepare UCR undergraduates for careers that involve genetic discovery, interpreting genetic information, and/or using genetic knowledge to create novel solutions to problems facing human health, food production, or the environment. This program emphasizes the development of practical skills for entering the workforce directly after graduation or pursuing postgraduate studies, including training in current laboratory and computational methods for genetic analysis and manipulation, analysis of scientific literature, and critical thinking. After establishing a foundation of basic genetic and biological principles, students may specialize in one of three tracks: Genetics and Genomics, Pre-Genetic Counseling, or ~~Genetic~~ Molecular Biotechnology. The Genetics and Genomics track provides broad training in genetic theories and analysis. The Pre-Genetic Counseling track has a reduced lab requirement and focuses on the typical prerequisites for postgraduate genetic counseling programs. It provides preparation for working with human genetic data that may be applicable to healthcare settings. The ~~Genetic~~ Molecular Biotechnology track offers more opportunities for organism-specific training in preparation for careers in the biomedical, microbial, or plant biotechnology industries. This track is focused on modifying living systems through genetic manipulation. ~~Students interested in biomedical engineering (e.g., developing artificial limbs or organs, sensors, or medical devices) should enroll instead in the Bioengineering major of the Bourns College of Engineering.~~

Transfer Students

Students planning to transfer to UCR with a major in Genetics and Molecular Biotechnology must have a minimum GPA of 2.7 in transferable college courses and "C" or higher grades in a one-year sequence of general chemistry and in courses equivalent to our BIOL 005A, BIOL 05LA, and BIOL 005B. We also require that transfer students complete two quarters of college calculus (equivalent to our MATH 007A and 007B or our MATH 009A and MATH 009B) before admission. Exceptions may be granted by the faculty advisor.

Major Requirements

Genetics and Genomics, Pre-Genetic Counseling, or ~~Genetic~~ Molecular Biotechnology Tracks

Core Requirements

1. Lower-division requirements (72-73 units)

Students must complete all required Core Curriculum courses with a grade of C- or better and with a cumulative GPA in the courses of at least 2.0. Grades of D or F in two required courses, either separate courses or repetitions of the same course, are grounds for discontinuation from the major.

a) BIOL 005A, BIOL 05LA or BIOL 020, BIOL 005B, BIOL 005C

b) CHEM 001A, CHEM 001B, CHEM 001C, CHEM 01LA, CHEM 01LB, CHEM 01LC or CHEM 01HA, CHEM 01HB, CHEM 01HC, CHEM 1HLA, CHEM 1HLB, CHEM 1HLC

c) CHEM 008A, CHEM 008B, CHEM 008C, CHEM 008LA, CHEM 008LB, CHEM 008LC or CHEM 08HA, CHEM 08HB, CHEM 08HC, CHEM 08HLA, CHEM 08HLB, CHEM 08HLC

d) MATH 007A or MATH 009A or MATH 09HA, MATH 007B or MATH 009B or MATH 09HB

e) PHYS 002A, PHYS 002B, PHYS 002C, PHYS 02LA, PHYS 02LB, PHYS

02LC or PHYS 02HA, PHYS 02HB, PHYS 02HC, PHYS 02HLA, PHYS 02HLB, PHYS 02HLC or PHYS 040A, PHYS 040B, PHYS 040C or PHYS 040HA, PHYS 040HB, PHYS 040HC

f) STAT 010

g) GNBT 010

2. Upper-division requirements (24 units)

a) BCH 100 or BCH 100H or BCH 110A or BCH 110HA

b) BIOL 102, BIOL 107A or BCH 110C or BCH 110HC, GNBT 100, GNBT 110, GNBT 114

Genetics and Genomics Track

1. Upper-division requirements (16-20 units)

a) GNBT 130

b) One laboratory course: GNBT 120 or BIOL118 or MCBL 121L/BIOL 121L or 4 units of GNBT 197/199*

c) Two or more of the following (8-12 units):

BCH 185, BCH 188, BIOL 105, BIOL 107B, BIOL 108, BIOL 115, BIOL 119, BIOL 148/BPSC 148, BPSC 109/CBNS 109, BPSC 150, BPSC/ENTM 184, CBNS 108, CBNS 150/ENTX 150, CBNS 165, ENTM 101, ENTM 111, ENTM 112/BIOL 112/BPSC 112, MCBL 121/ BIOL 121, MCBL 139/ENTM 139

Pre-Genetic Counseling Track

1. Upper-division requirements (16-20 units)

a) GNBT 120 or GNBT 130 or BIOL107B or BIOL 119

b) One of the following: PSYC 178, PBPL 160, PBPL 167/SOC 167, PBPL 127/SOC 127, or PBPL 162

c) Two or more of the following (8-12 units):

BCH 185, BCH 188, BIOL 107B, BIOL 108, BIOL 115, BIOL 118, BPSC 109/CBNS 109, BPSC 148/BIOL 148, CBNS 108, CBNS 121/PSYC 121, CBNS 150/ENTX 150, CBNS 165, CBNS 169, ENTM 111, ENTM 139/MCBL 139, GNBT 120, GNBT 130, 4 units of GNBT 197/199*, MCBL 121/ BIOL 121, MCBL 123/BIOL 123/PLPA 123, MCBL 124/BIOL 124, MCBL 129

~~Genetic~~ Molecular Biotechnology Track

1. Upper-division requirements (16-20 units)

a) One or two laboratory courses (4-8 units):

BPSC 104/BIOL 104, BPSC 143/BIOL 143, GNBT 120, 4 units of GNBT 197/199*, MCBL 121L/BIOL 121L, PLPA 120/BIOL 120/MCBL 120 and PLPA 120L/BIOL 120L/MCBL 120L

b) Two or more of the following (8-16 units):

BCH 188, BIOL 107B, BIOL 119, BPSC 109/CBNS 109, BPSC 135, BPSC 148/BIOL 148, BPSC 149, BPSC 150, BSPC183, BPSC184/ENTX 184, CBNS 108, CBNS 150/ENTX 150, CBNS 165, ENSC 120/NEM 120, ENSC 134/BPSC 134, ENTM 101, ENTM 111, ENTM 125/ENTX 125/PLPA 125, ENTM 126, ENTM 173/BIOL 173, GNBT 130, MCBL 121/BIOL 121, MCBL 123/BIOL 123/PLPA 123, MCBL126, MCBL 127, MCBL 129, MCBL 133/ENSC 133, MCBL 139/ENTM 139, NEM 159/BIOL 159

*GNBT 197/199 can be replaced by equivalent research-focused courses (e.g., BIOL 197/199, BPSC 197/199, etc.) with undergraduate advisor approval. Research pursued for credit of GNBT 197/199 or equivalent research-focused courses must be taken for letter grades and serve the training goals of the respective GNBT track.

Note: No more than 4 units of GNBT 197 or GNBT 199 may be used to fulfill major requirements. Additional units of GNBT 197 or GNBT199, or equivalent research-focused courses, may be used toward graduation.

Justification:

Genetic discoveries and their translation to biotechnological applications are at the forefront of modern advances in human health, agriculture, and environmental management. Individual genome sequencing gives consumers deeper knowledge of their ancestry and health risks that can guide approaches to preventative medicine as well as reproductive decisions. Personalized medicine matches pharmaceutical treatments with the genetic profile of a patient (or their cancer) to minimize side effects and maximize benefits. Vaccines and individualized cures for genetic diseases are being produced through genetic engineering. Food and agricultural biotechnology are improving food security by developing crops with increased resilience to climate change and pests, higher yields with more efficient utilization of agricultural inputs, cheaper and more sustainable sources of valuable natural products, and plant/microbe-based replacements for animal products. Environmental biotechnology is addressing global problems, such as climate change and pollution, through innovative solutions such as biological sequestration of carbon and biological remediation of environmental contaminants.

The goal of this major is to prepare UCR undergraduates for impactful, stimulating, and financially rewarding careers that involve genetic discovery, interpreting genetic information, and/or translating genetic knowledge to create new products through biotechnology. This B.S. degree program will give students a foundational understanding of genetics that can lead to jobs directly out of college or serve as a stepping-stone to more advanced degrees. A broad range of genetics-related careers in industry, government, and academia are possible, including laboratory scientist/technician, genetic counselor, forensic scientist, science/medical writer, bioprocessing specialist, bioinformatician, intellectual property/patent attorney, clinical geneticist, biotechnology salesperson/marketer, science teacher/professor, public health analyst, regulatory affairs officer, industry-government liaison, and science/health policy advisor (https://www.ashg.org/careers-learning/career-flowchart/). These careers are in demand. The life science industry, which is predominated by genetics and biotechnology, is a major economic engine for California. According to Biocom California's 2023 Life Science Economic Impact Report (https://cabiotech.org/biotech-impact/economy/), the biotechnology/life science industry generated $413.7 billion in economic output in 2022. This sector is also experiencing some of the strongest job growth in California with a 6% increase in employment. San Diego, Los Angeles, and the Bay Area are three major hubs for biotechnology within the state and nationwide. The regional proximity of well-paying job opportunities in biotechnology will be valuable for UCR graduates, many of whom have strong social ties to the southern California region.

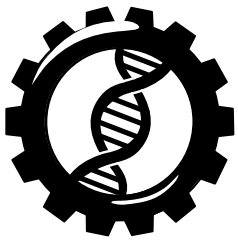
Approvals:

Approved by the faculty of the Department of Botany and Plant Sciences:	December 11, 2023
Approved by the Executive Committee of the College of Natural and Agricultural Sciences:	March 5, 2024
Approved by the Committee on Educational Policy:	April 5, 2024

UNIVERSITY OF CALIFORNIA
UC RIVERSIDE

College of Natural and Agricultural Sciences
UC Division of Agriculture and Natural Resources
Agricultural Experiment Station and Cooperative Extension

Proposal for a Bachelor of Science Degree Program in Genetics and Molecular Biotechnology



v. 2025.12.16

1. *Name of the academic program and the department(s) or unit(s) that will administer the program.*

   Name: B.S. in Genetics and Molecular Biotechnology (GNBT)

   Administration: The Genetics and Molecular Biotechnology major will be administered by the Department of Botany and Plant Sciences.

2. *A thorough justification, including the motivation for the creation of the program in terms of student interest and professional or academic importance.*

   Genetic discoveries and their translation to biotechnological applications are at the forefront of modern advances in human health, agriculture, and environmental management. Individual genome sequencing gives consumers deeper knowledge of their ancestry and health risks that can guide approaches to preventative medicine as well as reproductive decisions. Personalized medicine matches pharmaceutical treatments with the genetic profile of a patient (or their cancer) to minimize side effects and maximize benefits. Vaccines and individualized cures for genetic diseases are being produced through genetic engineering. Food and agricultural biotechnology are improving food security by developing crops with increased resilience to climate change and pests, higher yields with more efficient utilization of agricultural inputs, cheaper and more sustainable sources of valuable natural products, and plant/microbe-based replacements for animal products. Environmental biotechnology is addressing global problems, such as climate change and pollution, through innovative solutions such as biological sequestration of carbon and biological remediation of environmental contaminants.

   The goal of this major is to prepare UCR undergraduates for impactful, stimulating, and financially rewarding careers that involve genetic discovery, interpreting genetic information, and/or translating genetic knowledge to create new products through molecular biotechnology. This B.S. degree program will give students a foundational understanding of genetics that can lead to jobs directly out of college or serve as a stepping-stone to more advanced degrees. A broad range of genetics-related careers in industry, government, and academia are possible, including laboratory scientist/technician, genetic counselor, forensic scientist, science/medical writer, bioprocessing specialist, bioinformatician, intellectual property/patent attorney, clinical geneticist, biotechnology salesperson/marketer, science teacher/professor, public health analyst, regulatory affairs officer, industry-government liaison, and science/health policy advisor (https://www.ashg.org/careers-learning/career-flowchart/).

   These careers are in demand. The life science industry, which is predominated by genetics and biotechnology, is a major economic engine for California. According to Biocom California's 2023 Life Science Economic Impact Report (https://cabiotech.org/biotech-impact/economy/), the biotechnology/life science industry generated $413.7 billion in economic output in 2022. This sector is also experiencing some of the strongest job growth in California with a 6% increase in employment. San Diego, Los Angeles, and the Bay Area are three major hubs for biotechnology within the state and nationwide. The regional proximity of well-paying job opportunities in biotechnology will be valuable for UCR graduates, many of whom have strong social ties to the southern California region.

This program will also prepare undergraduates to enter advanced degree programs. For example, graduates of this program would be well-prepared to enter several genetics- and biotechnology-related M.S. degree options at UCR (e.g. Industrial Biotechnology) or the nearby Keck Graduate Institute (https://www.kgi.edu/academics/degrees-certificates/). For students interested in research, a robust background in genetics would be relevant preparation for a broad range of Ph.D. programs in biological sciences. For ~~pre-medical~~ students interested in human health-related careers, this degree will prepare them to integrate genetics into their future clinical work, and may help them stand out among a crowd of Biology majors. We envision that this major could be developed into a 4+1 M.S. program in the future.

Underscoring the importance of Genetics as a specialized discipline, many Tier 1 universities offer undergraduate majors in Genetics, Genomics, and/or Biotechnology. Within the UC system, UC Davis offers 1) Genetics and Genomics (B.S.) and 2) Biotechnology; UC Berkeley offers 1) Genetics and Plant Biology, and 2) Genetics, Genomics, Evolution, & Development; and UC Irvine offers Genetics (B.S.). Genetics majors are also found at many peer institutions outside the UC system, including the University of Wisconsin - Madison, Rutgers University, The Ohio State University, Purdue University, University of Georgia, and Michigan State University. The addition of a Genetics and Molecular Biotechnology undergraduate program to UCR would showcase the existing strengths of CNAS faculty in this area and help keep us competitive with peer institutions.

3. *Relationship of the new program to existing programs.*
Although UCR offers a PhD graduate program in Genetics, Genomics and Bioinformatics, it does not offer any undergraduate program with a major focus on these core elements of the modern biological curriculum. Several genetics-related courses are available for life-science undergraduate students, such as BIOL102 (Introductory Genetics) or BIOL107A (Molecular Biology), or more specialized courses such as BIOL148 (Quantitative Genetics). However, genetics education at UCR is quite fragmented across departments/programs with individual courses provided by EEOB, BPSC, ENTM, CBNS, MCBL, etc. In addition, there is insufficient depth in some foundational areas of genetics, such as genome composition across different kingdoms of life, how to analyze genomes and large-scale gene sequence datasets, and how genes are linked to their functions. GNBT will be a cohesive, intellectually grounded program that combines these existing courses with several new courses (see Appendix I ~~for course proposals~~) to provide well-rounded training in genetics.

The second major focus of GNBT, molecular biotechnology, concerns how genetic knowledge can be applied. This translational emphasis is important to students who are interested in making a direct impact on problems facing humanity, agriculture, and the environment. Biotechnology is partly covered by the UCR Bioengineering program. However, by combining it with genetics, the new GNBT program puts this important discipline in a different context and makes use of existing expertise and ongoing biotechnological research in CNAS. Furthermore, relevant Bioengineering courses are mostly inaccessible to CNAS students due to their prerequisite requirements. To make the distinction between the GNBT and Bioengineering programs clearer to students, we have changed the GNBT program name from Genetics and Biotechnology to **Genetics and Molecular Biotechnology**.

The Molecular Emphasis track of the Cell, Molecular, and Developmental Biology major is probably the most similar to GNBT. In comparison, GNBT will offer greater breadth and depth in genetics and will uniquely integrate the use of genetics in biotechnology. GNBT ~~will~~ also adds new upper-

division laboratory courses, which can be a bottleneck for graduation and are important for students to gain career-relevant, practical, hands-on experiences. GNBT 114 and GNBT 120 have already been accepted as satisfying a lab requirement for CMDB and ENTM majors in the 2025-26 catalog. In the future, we envision the development of additional courses such as Synthetic Biology, Statistics for Genetic Analysis, Introduction to Data Science for Biologists, and a Genetic Transformation Laboratory.

4. *The proposed curriculum. Great care should be given in this area, correct rubrics should be listed for courses, all cross listings should be listed, unit total considerations should be taken into account and totals should be verified by program staff, faculty, and appropriate Executive Committee personnel. A copy of the proposed program change should be provided for inclusion in the Catalog.*

Major Description

The B.S. in Genetics and Molecular Biotechnology is designed to prepare UCR undergraduates for careers that involve genetic discovery, interpreting genetic information, and/or using genetic knowledge to create novel solutions to problems facing human health, food production, or the environment. This program emphasizes the development of practical skills for entering the workforce directly after graduation or pursuing postgraduate studies, including training in current laboratory and computational methods for genetic analysis and manipulation, analysis of scientific literature, and critical thinking. After establishing a foundation of basic genetic and biological principles, students may specialize in one of three tracks: Genetics and Genomics, Pre-Genetic Counselings ~~in Healthcare~~, or Molecular Biotechnology. The Genetics and Genomics track provides broad training in genetic theories and analysis. The Pre-Genetic Counselings ~~in Healthcare~~ track has a reduced lab requirement and a greater focus on prerequisites for healthcare-related postgraduate programs such as genetic counseling. The Molecular Biotechnology track offers more opportunities for organism-specific training in preparation for careers in the biomedical, microbial, or plant biotechnology industries.

Transfer Students

Students planning to transfer to UCR with a major in Genetics and Molecular Biotechnology must have a minimum GPA of 2.7 in transferable college courses and “C” or higher grades in a one-year sequence of general chemistry and in courses equivalent to our BIOL 005A and BIOL 005B. We also require that transfer students complete two quarters of college calculus (equivalent to our MATH 007A and 007B or our MATH 009A and MATH 009B) before admission. Exceptions may be granted by the faculty advisor.

Major Requirements *(see Appendix II for course catalog descriptions)*

Genetics and Genomics, Pre-Genetic Counselings ~~in Healthcare~~, or Molecular Biotechnology Tracks

Core Requirements

1. Lower-division requirements (72-73 units)

Students must complete all required Core Curriculum courses with a grade of C- or better and with a cumulative GPA in the courses of at least 2.0. Grades of D or F in two required courses, either separate courses or repetitions of the same course, are grounds for discontinuation from the major.

a) BIOL 005A, BIOL 05LA or BIOL 020, BIOL 005B, BIOL 005C

b) CHEM 001A, CHEM 001B, CHEM 001C, CHEM 01LA, CHEM 01LB, CHEM 01LC or CHEM 01HA, CHEM 01HB, CHEM 01HC, CHEM 1HLA, CHEM 1HLB, CHEM 1HLC

c) CHEM 008A, CHEM 008B, CHEM 008C, CHEM 008LA, CHEM 008LB, CHEM 008LC or CHEM 08HA, CHEM 08HB, CHEM 08HC, CHEM 08HLA, CHEM 08HLB, CHEM 08HLC

d) MATH 007A or MATH 009A or MATH 09HA, MATH 007B or MATH 009B or MATH 09HB

e) PHYS 002A, PHYS 002B, PHYS 002C, PHYS 02LA, PHYS 02LB, PHYS 02LC or PHYS 02HA, PHYS 02HB, PHYS 02HC, PHYS 02HLA, PHYS 02HLB, PHYS 02HLC or PHYS 040A, PHYS 040B, PHYS 040C or PHYS 040HA, PHYS 040HB, PHYS 040HC

f) STAT 010

g) GNBT 010 (Genetics and Society)

2. Upper-division requirements (24 units)

a) BCH 100 or BCH 110A or BCH 110HA

b) BIOL 102, BIOL 107A or BCH 110C or BCH 110HC, GNBT 100 (Biotechnology), GNBT 110 (Advanced Genetics), GNBT 114 (Molecular Genetics Lab)

Genetics and Genomics Track

1. Upper-division requirements (16-20 units)

a) GNBT 130 (Genomes: Structure and Evolution)

b) One laboratory course: GNBT 120 (Analysis of Genomes) or BIOL 118 or MCBL 121L/BIOL 121L or 4 units of GNBT 197/199*

c) Two or more of the following (8-12 units): BCH 185, BCH 188, BIOL 105, BIOL 107B, BIOL 108, BIOL 115, BIOL 119, BIOL 148/BPSC 148, BPSC 109/CBNS 109, BPSC 150,

BPSC 184/ENTM 184, CBNS 108, CBNS 150/ENTX 150, CBNS 165, ENTM 101, ENTM 111, ENTM 112/BIOL 112/BPSC 112, MCBL 121/BIOL 121, MCBL 139

Pre-Genetic Counseling ~~in Healthcare~~ Track

1. Upper-division requirements (16-20 units)

a) GNBT 120 (Analysis of Genomes) or GNBT 130 (Genomes: Structure and Evolution) or BIOL 107B or BIOL 119

b) One of the following: PSYC 178, PBPL 160, PBPL 167/SOC 167, PBPL 127/SOC 127, or PBPL 162

c) Two or more of the following (8-12 units): BCH 185, BCH 188, BIOL 107B, BIOL 108, BIOL 115, BIOL 118, BPSC 109/CBNS 109, BPSC 148/BIOL 148, CBNS 108, CBNS 121/PSYC 121, CBNS 150/ENTX 150, CBNS 165, CBNS 169, ENTM 111, ENTM 139/MCBL 139, GNBT 120, GNBT 130, 4 units of GNBT 197/199*, MCBL 121/BIOL 121, MCBL 123/BIOL 123/PLPA 123, MCBL 124/BIOL 124, MCBL 129

~~Genetic~~ Molecular Biotechnology Track

1. Upper-division requirements (16-20 units)

a) One or two laboratory courses (4-8 units): BPSC 104/BIOL 104, BPSC 143/BIOL 143, GNBT 120 (Analysis of Genomes), 4 units of GNBT 197/199*, MCBL121L/BIOL121L, PLPA 120/BIOL 120/MCBL 120 and PLPA 120L/BIOL 120L/MCBL 120L

b) Two or more of the following (8-16 units): BCH 188, BIOL 107B, BIOL 119, BPSC 109/CBNS 109, BPSC 135, BPSC 148/BIOL 148, BPSC 149, BPSC 150, BSPC 183, BPSC 184/ENTX 184, CBNS 108, CBNS 150/ENTX 150, CBNS 165, ENSC 120/NEM 120, ENSC 134/BPSC 134, ENTM 101, ENTM 111, ENTM 125/ENTX 125/PLPA 125, ENTM 126, ENTM 173/BIOL 173, GNBT 130 (Genomes: Structure and Evolution), MCBL 121/BIOL 121, MCBL 123/BIOL 123/PLPA 123, MCBL 126, MCBL 127, MCBL 129, MCBL 133/ENSC 133, MCBL 139/ENTM 139, NEM 159/BIOL 159

*GNBT 197/199 can be replaced by equivalent research-focused courses (e.g. BIOL 197/199, BPSC 197/199, etc.) with undergraduate advisor approval. Research pursued for credit of GNBT 197/199 or equivalent research-focused courses must serve the training goals of the respective GNBT track.

Example course schedule with MATH 7A placement

MATH PLACEMENT: 7A				
	Fall	**Winter**	**Spring**	**Summer**
Year 1 **Total units: 48/49**	BIOL 5A, LA or 20 (5/6) CHEM 1A, 1LA (5) ENGL 1A (4)	BIOL 5B (4) CHEM 1B, 1BL (5) ENGL 1B (4) MATH 7A (4)	BIOL 5C (4) CHEM 1C, 1LC (5) ENGL 1C (4) MATH 7B (4)	
Units per Quarter	14/15	17	17	
Year 2 **Total units: 40**	CHEM 8A, 8LA (4) PHYS 2A, 2LA (5) SOC 001 (4)	CHEM 8B, 8LB (4) PHYS 2B, 2LB (5) GNBT 010 (4)	CHEM 8C, 8LC (4) PHYS 2C, 2LC (5) STAT 010 (5)	
Units per Quarter	13	13	14	
Year 3 **Total units: 37**	BIOL 102 (4) BCH 100 (4) Hum. Breadth (4)	BIOL 107A (4) STAT 010 (5) Hum. Breadth (4)	GNBT 110 (4) GNBT 114 (4) Hum. Breadth (4)	
Units per Quarter	12	13	12	
Year 4 **Total units: 36**	GNBT 100 (4) UD Major Elective (4) Soc. Breadth (4)	GNBT 120 (4) GNBT 130 (4) UD Major Elective (4)	PSYC 178 (4) UD Major Elective (4) Elective (4)	
Units per Quarter	12	12	12	
Total units:	**161/162**			

Genetics and Molecular Biotechnology (GNBT) Major Requirements

Lower-division requirements (72-73 units)

general biology (13-14 U): BIOL005A+B+C and BIOL05LA or BIOL020
general chemistry (15 U): CHEM001A+B+C and CHEM01LA+LB+LC (or honors versions)
organic chemistry (12 U): CHEM008A+B+C and CHEM08LA+LB+LC (or honors versions)
calculus (8 U): MATH007A+B or MATH009A+B or MATH09HA+B
general physics (15 U): PHYS002A+B+C and PHYS02LA+LB+LC (or honors versions, or PHYS40 ABC series w/o labs)
intro statistics (5 U): STAT010
GNBT010 Genetics and Society (4 U)

Upper-division requirements (24 units)

BCH100 Introductory Biochemistry (4 U) or BCH110A (or honors) General Biochemistry (4 U)
BIOL102 Introductory Genetics (4 U)
BIOL107A Molecular Biology (4 U) or BCH110C (or honors) General Biochemistry (4 U)
GNBT100 Biotechnology (4 U)
GNBT110 Advanced Genetics (4 U)
GNBT114 Molecular Genetics Lab (4 U)

+ 16-20 units from one of the following tracks

Genetics & Genomics

a) GNBT130 Genomes: Structure and Evolution (4 U)

b) One laboratory course (4 units)
GNBT120 Analysis of Genomes (4 U)
BIOL118 Methods in Molecular Ecology and Evolution (4 U)
MCBL/BIOL121L Microbiology Laboratory (4 U)
GNBT197/199 Research for Undergraduates (4 U total)

c) Two or more electives (8-12 units)
BCH185 Epigenetics in Development and Disease (4 U)
BCH188 Fundamentals of Genomics Technologies (4 U)
BIOL105 Evolution (4 U)
BIOL107B Advanced Molecular Biology (4 U)
BIOL108 Population Genetics and Genomics (4 U)
BIOL115 Human Genetics (4 U)
BIOL119 Introduction to Genomics and Bioinformatics (4 U)
BIOL/BPSC148 Quantitative Genetics (4 U)
BPSC/CBNS109 Epigenetics (4 U)
BPSC150 Genes, Selection, and Populations (4 U)
BPSC/ENTM184 Planning Postgrad Career in Life Sci (2 U)
CBNS108 Introduction to Developmental Biology (4 U)
CBNS/ENTX150 Cancer Biology (4 U)
CBNS165 Stem Cell Biology (4 U)
ENTM101 Evolution of Insect Genomes
ENTM111 Mol Biol & Genomics of Human Disease Vectors (3 U)
ENTM/BIOL/BPSC112 Systematics (4 U)
ENTM/MCBL139 The Evolution of Conflict and Cooperation (4 U)
MCBL/BIOL121 Introductory Microbiology (4 U)

Molecular Biotechnology

i) One or two laboratory courses (4-8 units)
BPSC/BIOL104 Foundations of Plant Biology (4 U)
BPSC/BIOL143 Plant Physiology (4 U)
GNBT120 Analysis of Genomes (4 U)
MCBL/BIOL121L Microbiology Laboratory (4 U)
GNBT197/199 Research for Undergraduates (4 U total)
PLPA/BIOL/MCBL120+120L Introduction to Plant Pathology with Lab (4 U)

ii) Two or more electives (8-16 units)
BCH188 Fundamentals of Genomics Technologies (3 U)
BIOL107B Advanced Molecular Biology (4 U)
BIOL119 Introduction to Genomics and Bioinformatics (4 U)
BPSC/CBNS109 Epigenetics (4 U)
BPSC135 Plant Cell Biology (4 U)
BPSC/BIOL148 Quantitative Genetics (4 U)
BPSC149 Nanobiotechnology (2 U)
BPSC150 Genes, Selection, and Populations (4 U)
BSPC183 Plant Biochem. & Pharm. of Plant Metabolites (4 U)
BPSC/ENTM184 Planning Postgrad Career in Life Sci (2 U)
CBNS108 Introduction to Developmental Biology (4 U)
CBNS/ENTX150 Cancer Biology (4 U)
CBNS165 Stem Cell Biology (4 U)
ENSC/NEM120 Soil Ecology (4 U)
ENSC133 Environmental Microbiology (4 U)
ENSC/BPSC134 Soil Conditions and Plant Growth (4 U)
ENTM101 Evolution of Insect Genomes (4 U)
ENTM111 Mol Biol & Genomics of Human Disease Vectors (3 U)
ENTM/ENTX/PLPA125 Pesticides, Biol Organisms, & the Environment (3 U)
ENTM126 Medical and Veterinary Entomology (4 U)
ENTM/MCBL139 The Evolution of Conflict and Cooperation (4 U)
ENTM/BIOL173 Insect Physiology (4 U)
GNBT130 Genomes: Structure and Evolution (4 U)
MCBL/BIOL121 Introductory Microbiology (4 U)
MCBL/BIOL/PLPA123 Introduction to Comparative Virology (4 U)
MCBL126 Microbiomes (3 U)
MCBL127 Microbial Evolution (4 U)
MCBL129 Host Responses to Viral Pathogens (4 U)
MCBL/ENSC133 Environmental Microbiology (4 U)
NEM/BIOL159 Biology of Nematodes (3 U)

Pre-Genetic Counseling

a) One of
GNBT120 Analysis of Genomes (4 U)
GNBT130 Genomes: Structure and Evolution (4 U)
BIOL107B Advanced Molecular Biology (4 U)
BIOL119 Introduction to Genomics and Bioinformatics (4 U)

b) PSYC178 Health Psychology (4 U)

c) Two or more electives (8-12 units)
BCH185 Epigenetics in Development and Disease (4 U)
BCH188 Fundamentals of Genomics Technologies (3 U)
BIOL107B Advanced Molecular Biology (4 U)
BIOL108 Population Genetics and Genomics (4 U)
BIOL115 Human Genetics (4 U)
BIOL118 Methods in Molecular Ecology and Evolution (4 U)
BPSC/CBNS109 Epigenetics (4)
BPSC/BIOL148 Quantitative Genetics (4 U)
CBNS108 Introduction to Developmental Biology (4)
CBNS/PSYC121 Developmental Neuroscience (4)
CBNS/ENTX150 Cancer Biology (4)
CBNS165 Stem Cell Biology (4)
CBNS169 Human Embryology (4)
ENTM111 Mol Biol & Genomics of Human Disease Vectors (3 U)
ENTM/MCBL139 The Evolution of Conflict and Cooperation (4 U)
GNBT120 Analysis of Genomes (4 U)
GNBT130 Genomes: Structure and Evolution (4 U)
GNBT197/199 Research for Undergraduates (4 U total)
MCBL/BIOL121 Introductory Microbiology (4 U)
MCBL/BIOL/PLPA123 Introduction to Comparative Virology (4 U)
MCBL/BIOL124 Medical Microbiology (4 U)
MCBL129 Host Responses to Viral Pathogens (4 U)

v. 2025.12.16

5. *A list of faculty who will be involved in the program, including those teaching, advising, and administering.*

GNBT planning committee
Daniel Koeing, Botany and Plant Sciences
Danelle Seymour, Botany and Plant Sciences
David Nelson, Committee chair, Botany and Plant Sciences
Dawn Nagel, Botany and Plant Sciences
Jaimie Van Norman, Botany and Plant Sciences
Sean Cutler, Botany and Plant Sciences
Susan Wessler, Botany and Plant Sciences
Thomas Eulgem, Botany and Plant Sciences

GNBT program participants
Adam Jozwiak, Botany and Plant Sciences
Ansel Hsiao, Microbiology and Plant Pathology (primary for BIOL 121)
Anupama Dahanukar, Molecular, Cell, and Systems Biology
Carolyn Rasmussen, Botany and Plant Sciences
Frances Sladek, Molecular, Cell, and Systems Biology
Hailing Jin, Microbiology and Plant Pathology
Jason Stajich, Microbiology and Plant Pathology
Juan Pablo Giraldo, Botany and Plant Sciences
Julia Bailey-Serres, Botany and Plant Sciences
Katayoon Dehesh, Botany and Plant Sciences
Kieran Samuk, EEOB (primary for BIOL108)
Linda Walling, Botany and Plant Sciences
Maria Ninova, Biochemistry (primary for BCH188)
Meng Chen, Botany and Plant Sciences
Morris Maduro, Molecular, Cell, and Systems Biology
Nicole zur Neiden, Molecular, Cell, and Systems Biology
Patricia Springer, Botany and Plant Sciences
Robert Jinkerson, Chemical and Environmental Engineering
Sihem Cheloufi, Molecular, Cell, and Systems Biology
Simon Groen, Assistant Professor, Nematology
Thomas Girke, Botany and Plant Sciences
Venugopala Reddy, Botany and Plant Sciences
Zhenyu (Arthur) Jia, Botany and Plant Sciences
Kate Ostevik, EEOB (primary for BIOL105)

6. *For interdisciplinary programs, the degree of participation and the role of each department must be explicitly described. The chairs of all participating departments must provide written approval*

for the creation of the program and indicate their commitment to provide necessary resources including faculty release.

The Botany and Plant Science department will be responsible for the management of the GNBT major.

7. *Projected enrollment in the program.*

   We surveyed other universities offering a degree in Genetics with similarly sized undergraduate student bodies (20,000 to 40,000 students). At these universities enrollment in the major ranged from 200-400 students and the number of enrolled students was proportional to the size of the student body. Based on this information, we expect a class of 240 students at steady state. In the first year that we offer the major, we anticipate an initial enrollment of 30-40. Over time, we expect 60-70 students to join the program annually.

8. *Name of degree, if applicable, and the anticipated number of degrees to be granted when the program reaches steady state.*

   Degree name: Bachelor of Science in Genetics and Molecular Biotechnology

   Anticipated number of degrees per year: 60

9. *Potential impact of the new program on existing programs. If the proposed program includes required courses from a department other than the administering department, the proposal must include a statement from the department indicating that it has been consulted and that it will provide access to the required courses.*

   The pool of potential GNBT undergraduates is expected to primarily overlap with Biology, the largest undergraduate program at UCR. GNBT is unlikely to cause burdensome increases in enrollment in courses from other programs. Instead, GNBT will provide new courses that may be of interest to students in biology-related disciplines, helping to alleviate over-enrollment issues and provide more paths to timely graduation.

   Please see Appendix III for letters of support from departments that offer required or elective courses for the GNBT program.

10. *A full listing of resources required for start-up and for operations. In cases where no additional resources will be needed, this must be explicitly stated. This listing may include: personnel (faculty FTE or temporary positions, Teaching Assistants or Readers, administrative staff, technical support); support services including computer facilities and library resources; space requirements. A plan indicating how the resources will be obtained would also be helpful to the committee in reviewing the proposal. A letter of support from the College Dean and/or Executive Vice Chancellor-Provost indicating endorsement as well as a promise of support for the proposal also would be extremely helpful.*

    Faculty FTE: We ~~propose to~~have developed four core courses for the Genetics and Molecular Biotechnology major (GNBT 010, GNBT 100, GNBT 110, and GNBT 114) that are required for degree completion in all three tracks of the major (Genetics and Genomics, Pre-Genetic

Counselings in Healthcare, and Molecular Biotechnology).The three proposed tracks variably require two additional new courses, GNBT 120 and GNBT 130. Initially, each course will be offered one time per year. This will require six faculty members, each of whom will teach one course. Two proposed courses, GNBT 114 and GNBT 120, are laboratory courses. The first laboratory, GNBT 114, will train students in molecular genetic techniques. The second, GNBT 120, is a hands-on introduction to computational biology. The lecture portion of these courses will include up to 48 students, with each laboratory section limited to 24 students. Faculty members, with support from staff and TAs, will lead the laboratory portion of these courses. As the major grows, additional faculty instructors will be needed to increase the offering of these laboratory courses. The enrollment of larger lecture-based courses can scale with the needs of the major, although a maximum of 60-70 students is preferred. GNBT 197/199 are additional options for undergraduate research experiences; students will register for a section specific to their faculty mentor.

TA support: Six of the proposed GNBT courses (not GNBT197/199) include a discussion section and TA support. A total of six TA positions (50%) are needed to support GNBT courses in the first year of the major. If enrollment in a laboratory course exceeds 24 in the first year, then additional TA positions will be needed. Because GNBT 010 is an introductory course that will be accessible to studentssatisfies a breadth requirement from other colleges, it has the potential to attract large enrollment. In its second year (Winter 2026), enrollment for GNBT 010 has already reached its maximum of 80. As it grows, a proportional number of TA positions will be required to assist with teaching discussion sections and grading written assignments.

Administrative staff: A professional undergraduate advisor within the CNAS Undergraduate Academic Advising Center will be needed for GNBT. Faculty undergraduate advisors will be drawn from faculty members affiliated with GNBT. In addition, support from an enrollment management specialist in the CNAS Enrollment Management Center will be needed for scheduling GNBT courses.

Laboratory support: A full-time lab coordinator will be needed for GNBT 114. It is possible that this position could be split with BPSC, such that labs for BPSC and GNBT were jointly coordinated by one individual. In this case, a part-time lab assistant would likely be required. Alternatively, cooperation with Dynamic Genome staff could be explored. Initially, we anticipate two sections of GNBT 114 per year (ideally in one quarter), scaling up to four or six sections as the program increases in size and the course attracts students from related majors (e.g. BIOL, CMDB, CBNS). In terms of physical infrastructure, modern lab spaces will be required that have benches, appropriate safety equipment (e.g. eye wash stations), storage cabinets (for lab items and student personal items), fume hood, sinks, 4˚C and -20˚C storage, prep space, including nearby autoclaves and sterile work space, and growth space, including incubators for various organisms (plant, microbes, etc). Remodeled, existing BPSC lab spaces can be used in part, but will not be sufficient to support the increased number of lab courses due to this major. Additional equipment needed includes 2 fluorescent stereomicroscopes, 20 compound microscopes and 10 stereoscopes, 24 sets of pipettes (1 per student), gel electrophoresis set ups (6, one per group of 4), gel imaging system, various tube racks (0.2mL, 1.7 mL, 15 mL, etc.), various plastics and glassware (petri plates, etc.), stir plates, pH meter, and thermal cyclers.

Computational lab support: The computational lab, GNBT 120, will require teaching assistant appointments for each section. We anticipate offering one section per year initially, with scaling up to additional sections as necessary in the future. Laboratories should be equipped with one computer per enrolled student. Computers will need to support access to the on-campus High

Performance Computer Cluster (HPCC) and have installed appropriate software including terminal emulation, R, Rstudio, and Python. Computational labs should be accessible outside of class hours.

11. *Both internal and external letters of support should be provided with the proposal. Internal letters of support are often from UCR department chairs and faculty of related programs. The external letters should be from other UC campuses or other peer institutions. Letters from off-campus help to establish the quality of the program and its fit within the context of related programs at other universities. Upon consultation with the CEP the demand for external letters may be waived.*

    Please see Appendix III for internal and external letters of support.

12. *Approvals from program faculty, College faculty (if the new proposal affects a college regulation), and the appropriate Executive Committee should be obtained before forwarding the new program to the attention of the Senate Analyst for CEP.*

APPENDIX I. NEW COURSES (all are approved and currently offered) ~~PROPOSALS~~

also called environmental niche modeling or habitat suitability modeling. Addresses biogeographical theories of species niche, data models for species and environmental data, and data analysis and model validation. Applies modern regression (Generalized Linear Models) and other modeling techniques (GAMs, classification trees, MaxEnt) using R software. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

BPSC 245 Advanced Plant Ecology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 009C or MATH 09HC; STAT 110 or STAT 231A or equivalent; an undergraduate course in ecology; or consent of instructor. Explores the fundamental ecological concepts, theoretical developments, quantitative methods, and experimental results involved in multiscale plant ecological studies. Emphasizes plant strategies, vegetation processes, ecosystem properties, and terrestrial landscapes and their interaction with environmental change and human land use.

BPSC 246 Landscape Ecology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 116 or BPSC 146; STAT 231A; or consent of instructor. Introduces landscape ecology both as a sub-discipline of ecology and an interdisciplinary approach for environmental research. Includes identification of spatial patterns, pattern-process relationships, and scaling. Analyzes population, community, and ecosystem dynamics in connection with landscape functioning. Evaluates landscape theory and methods for applications in species conservation, pollution, and climate changes.

BPSC 247 Ecological Theory and Modeling 4 Lecture, 2 hours; discussion, 2 hours. Prerequisite(s): MATH 009C or MATH 09HC; STAT 110 or STAT 231B or equivalent; an undergraduate course in ecology; or consent of instructor. Explores the fundamental ecological theory and modeling methodology with emphasis on the ecosystem and landscape levels. Synthesizes current research developments in the context of their classic works.

BPSC 250 Seminar in Plant Biology 1 Seminar, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Intensive study of selected topics in plant biology. Includes lectures by students, faculty, and invited scholars on subjects related to the principles of plant biology. Students who present a seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

BPSC 252 Special Topics in Botany/Plant Science 1 Seminar, 1 hour. Prerequisite(s): graduate standing and consent of instructor. Oral presentations and intensive small-group discussion of selected topics in the area of special competence of each staff member. Course content will emphasize recent advances in the special topic area and will vary accordingly. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

BPSC 261 Seminar in Genetics, Genomics, and Bioinformatics 1 Seminar, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Oral reports by visiting scholars, faculty, and students on current research topics in Genetics, Genomics, and Bioinformatics. Graded Satisfactory (S) or No Credit (NC). Course is repeatable. Cross-listed with BCH 261, BIOL 261, ENTM 261, PLPA 261, and GEN 261.

BPSC 290 Directed Studies 1 to 6 Individual Study, 3 to 18 hours. Prerequisite(s): graduate standing; and consent of instructor. Library, laboratory, or field studies conducted under the direction of a faculty member. Designed to meet specific curricular needs in areas of plant biology not covered by formal course work and outside of required directed dissertation or thesis research. Not intended to replace BPSC 297 or BPSC 299.

BPSC 291 Individual Study in Coordinated Areas 1 to 6 Prerequisite(s): graduate standing. A program of study designed to advise and assist candidates who are preparing for examinations. Up to 6 units may be taken prior to the master's degree. Up to 12 units may be taken prior to advancement to candidacy for the Ph.D. Graded Satisfactory (S) or No Credit (NC). Course is repeatable upon recommendation of the instructor.

BPSC 292 Concurrent and Advanced Studies in Botany and Plant Sciences 1 to 4 Research, 3 to 12 hours. Prerequisite(s): graduate standing; and consent of instructor. Elected concurrently with an appropriate undergraduate course, but on an individual basis. Devoted to one or more graduate projects based on research and criticism related to the course. Faculty guidance and evaluation is provided throughout the quarter.

BPSC 297 Directed Research 1 to 6 Research, 3 to 18 hours. Prerequisite(s): graduate standing or consent of instructor. Individual research conducted under the direction of a Botany and Plant Sciences faculty member. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

BPSC 299 Research For Thesis Or Dissertation 1 to 12 Thesis, 3 to 36 hours. Prerequisite(s): graduate standing. Original research in an area selected for the advanced degree. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

Genetics and Biotechnology

Lower-Division Courses

GNBT 010 Genetics and Society 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A is recommended. Explores how genetic discoveries and technology shape human society in healthcare, reproduction, food, and the environment. Presents science concepts at a level accessible to non-majors. Emphasizes bioethical analyses and considers the cost-benefit tradeoffs of genetic advances.

Upper-Division Courses

GNBT 100 Introduction to Biotechnology: From Cloning to Synthetic Biology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 102 with a grade of C- or better; or equivalent; or consent of instructor. Introduces fundamental techniques used in biotechnology and the molecular biological foundations of biotechnology. Topics include gene cloning, the science of genetically modified organisms (GMOs), microbial and synthetic biology, the design of new purpose-driven organisms and microbial cell factories, biosensing, gene editing, and other contemporary topics in biotechnology.

GNBT 110 Advanced Genetics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 102 with a grade of C- or better; or consent of instructor. Teaches the process of associating genes with biological function. Topics include genetics screens, gene characterization, and discovery of genetic pathways. Examines the rationale and design of experiments to investigate hypothesis-driven questions using genetic approaches.

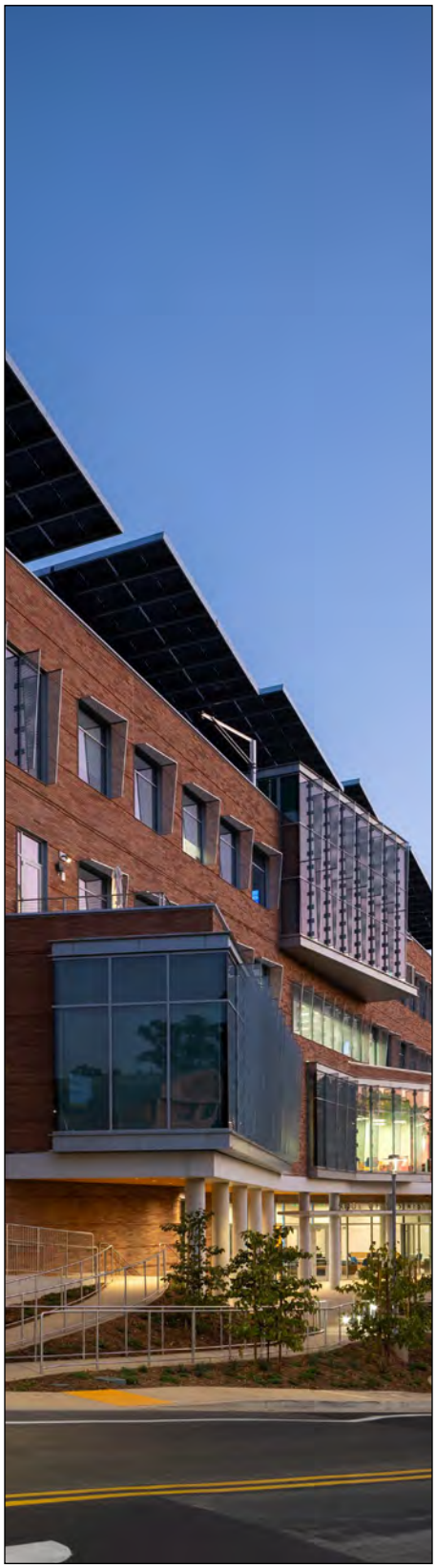
GNBT 114 Molecular Genetics Laboratory 4 Lecture, 2 hours; laboratory, 6 hours. Prerequisite(s): BIOL 102 with a grade of C- or better, BIOL 107A, may be taken concurrently. Reinforces important concepts in classical and molecular genetics through laboratory work in basic molecular biology and genetics. Includes DNA manipulation techniques and cloning, gene mapping, and isolation and characterization of mutants in eukaryotic model systems.

GNBT 120 Analysis of Genomes Laboratory 4 Lecture, 1 hour; discussion, 1 hour; laboratory, 6 hours. Prerequisite(s): BIOL 005C with a grade of C- or better, BIOL 102 with a grade of C- or better; MATH 007B or MATH 009B or MATH 09HB with a grade of C- or better. Introduces computational approaches used in analysis of genomes and their functional outputs. Topics include genome assembly and annotation, identification and analysis of genomic sequence variation, modern molecular mutant identification, quantitative trait mapping, genome-wide association mapping, mRNA and small RNA profiling, network analysis, and comparative genomics. Computer programming experience not required.

GNBT 130 Genomes: Structure and Evolution 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 102 with a grade of C- or better. Explores the content of genomes from microbes to plants to animals emphasizing how they are analyzed and how they diversify and evolve.

GNBT 197 Research For Undergraduates 1 to 4 Research, 3 to 12 hours. Prerequisite(s): restricted to class level standing of junior, or senior; and consent of instructor. Individual research conducted under the direction of a Genetics and Biotechnology-affiliated faculty member. A written proposal must be approved by the supervising faculty member and undergraduate advisor. Course is repeatable.

GNBT 199 Senior Research 2 to 4 Research, 6 to 12 hours. Prerequisite(s): restricted to class level standing of senior; and consent of instructor. Individual research on a problem relating to GNBT program goals. A written proposal signed by the supervising faculty member must be approved by the GNBT undergraduate advisor. Course is repeatable to a maximum of 9 units.



Business Administration

Subject abbreviation: BUS
The School of Business

Yunzeng Wang, Ph.D., Dean
900 University Ave.
(951) 827-2932

Undergraduate Business Programs Office
900 University Ave.
(951) 827-4551; fax: (951) 827-5061
business.ucr.edu

Professors

Subramanian 'Bala' Balachander, Ph.D. *Albert O. Steffey Chair* (Marketing)
Margaret Campbell, Ph.D. *Associate Dean and Department Chair, and A. Gary Anderson Family Foundation Endowed Presidential Chair* (Marketing)
Y. Peter Chung, Ph.D. (Finance)
Elodie Goodman, Ph.D. (Operation and Supply Chain Management)
Mohsen El-Hafsi, Ph.D. (Operations and Supply Chain Management)
Jerayr 'John' Haleblian, Ph.D. *Associate Dean, and A. Gary Anderson Family Foundation Endowed Presidential Chair in Business Administration* (Management)
Jean Helwege, Ph.D. *A. Gary Anderson Family Foundation Endowed Presidential Chair in Finance* (Finance)
Thomas Kramer,Ph.D. *Associate Dean for the Academic Undergraduate Programs* (Marketing)
Birendra Mishra, Ph.D. (Accounting)
Theodore Mock, Ph.D. *Distinguished Professor* (Accounting)
Ashutosh Prasad, Ph.D. (Marketing)
Yunzeng Wang, Ph.D. *Dean's Distinguished Scholar* (Operations and Supply Chain Management)
Ivy Zhang, Ph.D. (Accounting and Information System)
Rami Zwick, Ph.D. *Associate Dean for the Academic Graduate Programs* (Marketing)

Professors Emeriti

Bajis M. Dodin, Ph.D. (Operations and Supply Chain Management)
Woody Liao, Ph.D. (Accounting)
Kathleen Montgomery, Ph.D. *Distinguished Professor* (Management)
Michael Moore, Ph.D. (Accounting)
Amnon Rapoport, Ph.D. *Distinguished Professor* (Management)
Waymond Rodgers, Ph.D. (Accounting and Information Systems)
Richard Smith, Ph.D. (Finance)
David Stewart, Ph.D. *Distinguished Professor* (Marketing)

Associate Professors

Alexander Barinov, Ph.D. (Finance)
Hai Che, Ph.D. (Marketing)
Long Gao, Ph.D. (Operations and Supply Chain Management)
Michael Haselhuhn, Ph.D. (Management)
Hyun 'Shana' Hong, Ph.D. (Accounting)
Yawen Jiao, Ph.D. (Finance)
Boris Maciejovsky, Ph.D. (Management)
Marlo Raveendran, Ph.D. (Management)
Ashish Sood, Ph.D. (Marketing)
Danko Turcic, Ph.D. (Operations and Supply Chain Management)
Mindy Truong, Ph.D. (Management)
Elaine Wong, Ph.D. (Management)

Assistant Professors

Eric Allen, Ph.D. (Accounting)
Richard Carrizosa, Ph.D. (Accounting)
Mengmeng Dong, Ph.D. (Finance)
Mingyu 'Max' Joo, Ph.D. (Marketing)
Demetrius Lewis, Ph.D. (Management)
Adem Orsdemir, Ph.D. (Operations and Supply Chain Management)

Assistant Professor of Teaching

Neman Desai, Ph.D. (Accounting)
Kyle Ingram, Ph.D. (Management)
Jonathan Lim, Ph.D. (Marketing)
Sanjoy Moulik, Ph.D. (Information Systems)
Greg Richey, Ph.D. (Finance)
Rich Yueh, Ph.D. (Information Systems)

Lecturers

Arturo Alcaraz (Management)
Sean Jasso, Ph.D. (Management and Marketing)
Jonathan Pittard, M.B.A. (Accounting)
Raj Singh, Ph.D. (Management)

Majors

The B.S. in Business Administration is a two-year upper-division major offered by the School of Business. Students can enroll in a Pre-Business status and are advised in CHASS during their freshman and sophomore years. The Pre-Business curriculum includes the prerequisites to the major and the college breadth requirements. After admission to the major, students are advised by the School of Business through its Undergraduate Business Programs Office located at 0241 School of Business Building. The B.S. degree in Business Administration is conferred by the School of Business.

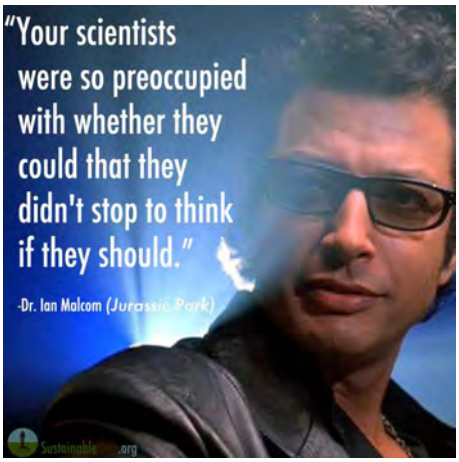
The program is accredited by the AACSB International - The Association to Advance Collegiate Schools of Business.

Admission

A limited number of students are accepted into the Business Administration major, chosen according to overall GPA. Students must apply for the major when they have completed not fewer than 75 and not more than 100 quarter units of college work. Final acceptance into the major is based on completion of all prerequisites and breadth requirements within a 100-quarter-unit limit, a GPA of 2.50 or above in major prerequisites, and cumulative GPA of at least 2.70. (Students who have not completed the foreign language breadth requirement, ENGL 001C, or one Social Science course of their breadth requirement, may be accepted into the program, but they must complete the requirement before graduation.) Exceptions to the 100-quarter-unit maximum must be requested by petition.

UCR Students (excluding Pre-Business students) interested in changing major to Business Administration will be admissible to the Business Preparatory (BSPR), (which is not a major in UCR, but a holding group of transfer students who appear to be qualified for admission into business administration, but have some deficiencies which need to be completed before admission into business administra-

Course title
Genetics and Society (4 units)



Course catalog description from CRS proposal
Explores how genetic discoveries and technology are shaping human society on issues ranging from healthcare to reproduction to engineering food and the environment. Science concepts are introduced at a level accessible to non-majors. Emphasizes bioethical analyses and considers the cost-benefit tradeoffs of genetic advances.

Faculty contact hours
Lecture - 3 hours per week

Learning objectives
- be able to form rational arguments for and against a genetic technology based upon bioethical principles and cost-benefit tradeoffs
- understand how modern genetic technologies work at an introductory level
- understand how emerging genetic technologies are likely to impact human society now and in the coming decades
- be able to think critically about popular science news, identify reliable sources of information, and distinguish hype and opinions from facts

Grading breakdown
Homework 60%
Term paper 20%
Final exam 20%

Grading scale
A 90-100%
B 80-89%
C 70-79%
D 60-69%
F <60%

Description of course activities
Lectures (3 hours per week). Lectures will be partly didactic (introducing students to genetic concepts/technology) and partly socratic (lecturer-led question and answers, e.g. regarding ethical considerations and trade-offs).

Discussion (1 hour per week). Discussion sections will allow more small-group activities and student participation in ethical discussions. Difficult biological concepts will be reviewed.

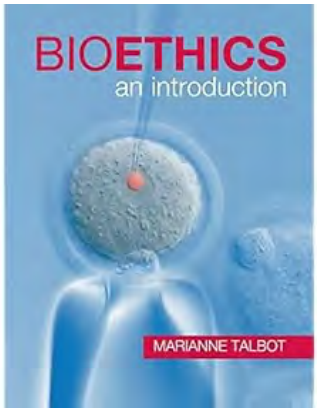
Reading. Reading assignments will include popular news articles, case studies, and texts on bioethics. In some cases, videos/film will be used to supplement readings.

Homework. Students will provide written answers (typically paragraph-length responses) to a few questions each week intended to provoke reflections on assigned readings and lecture topics. For example, questions may query students' understanding of a genetic technology or topic, or ask them to imagine specific scenarios in which the genetic technology may have a positive or

negative outcome, construct and evaluate an ethical argument, or discuss how a specific bioethical principle may be met or violated during the use of a genetic technology.

Term paper. Students will identify a recent genetics-related news article and write a 3-page report on it. They will identify the source of the information in the article, assess whether the article is accurately reporting the findings, whether the article appears to be biased or not, discuss the major findings/concepts in the news article and the practical and ethical implications of the genetic discovery/advance.

Final exam. The final exam will be held in-person and will emphasize essay responses.



List of required texts and readings

Talbot, Marianne. (2012). *Bioethics: An Introduction* (1st ed.). Cambridge University Press. ISBN 978-0521714594

Course policies

Conduct

You are expected to be professional and courteous in your class interactions, whether online or in person. This includes

- avoiding distracting other students from learning
- keeping comments and questions limited to the course subject matter
- being aware that there are a diversity of views, beliefs, backgrounds, and experiences within the class which may not be similar to your own; do your best to be respectful of others
- refraining from intentionally offensive (e.g. sexist, racist, political, etc.) comments or behavior
- maintaining academic integrity
- following campus health guidelines

Academic Integrity

All students are expected to maintain high standards for academic integrity. Students are strongly encouraged to review UCR policies for student conduct and integrity (https://conduct.ucr.edu/). If you have any questions, please ask the instructor before you act.

Plagiarism is the most common form of academic misconduct at UCR. It is the appropriation of another person's ideas, processes, results, or words without giving appropriate credit. This includes the copying of language, structure, or ideas of another and attributing (explicitly or implicitly) the work to one's own efforts. Plagiarism means using another's work without giving credit. Note that placing text within quotes and citing it is also not an acceptable substitution for providing original thoughts. For more information about plagiarism, see Academic Integrity Policies and Procedures. While you are encouraged to engage in discussions with other students during homework assignments, submissions for all graded assignments must be your own, original work. ChatGPT and other LLMs are not allowed for the development or revision of rough or final drafts. Plagiarism is a violation of academic integrity and will be handled accordingly. Any suspected cases of cheating, plagiarism, etc. will be forwarded directly to the Office of Student Conduct for their independent review and academic sanctions.

List of topics and readings by week

	Topic	Reading
Week 1	Introduction to ethical theories	Bioethics Ch. 2-4 (p.11-49) "Ethics in general", "Ethics in the context of society", and "Ethical theories: virtue, duty and happiness"
	Core principles of bioethics: Non-maleficence, justice, autonomy, beneficence, truth telling, and confidentiality	
Week 2	Forming and evaluating ethical arguments	Bioethics Ch. 5-6 (p. 50-90)
	A history of eugenics	National Human Genome Research Institute. "Eugenics: Its Origin and Development (1883 - Present)" https://www.genome.gov/about-genomics/educational-resources/timelines/eugenics Bioethics Ch. 9 (p. 139-158) "Reproductive freedom: rights, responsibilities, and choice"
Week 3	Genetic determinism and genetic risk	Niccol, Andrew. (1997). "Gattaca". *Columbia Pictures*
	Genetic testing and genome sequencing technologies	
Week 4	Implications of personalized genetic knowledge	
	Privacy and ownership of genetic information	Seife, Charles. (2013). "23andMe Is Terrifying, but Not for the Reasons the FDA Thinks". *Scientific American* Bioethics Ch. 18 (p. 348-370), "Bio-ownership: who owns the stuff of life?"
Week 5	Genetic discrimination	Bioethics Ch. 15 (p.273-296), "Bio-information: databases, privacy and the fight against crime"
	Genetics in crime - use as evidence and in recidivism prediction models	
Week 6	Soft eugenics - *in vitro* fertilization, embryonic selection, prenatal sequencing	Zhang, Sarah. (2020). "The Last Children of Down Syndrome". *The Atlantic* Bioethics Ch. 11 (p. 181-202) "Screening and embryonic selection: eliminating disorders or people?"
	Changing reproduction - three-parent babies and *in vitro* gametogenesis	Cohen et al. (2017). "Disruptive reproductive technologies" *Science* Stein, Rob. (2023). "Creating a sperm or egg from any cell? Reproduction revolution on the horizon". *NPR. https://www.npr.org/sections/health-shots/2023/05/27/1177191913/sperm-or-egg-in-lab-breakthrough-in-reproduction-designer-babies-ivg*
Week 7	Genome editing technologies	Bioethics Ch. 14 (p. 251-272), "Human enhancement: the more the better?"
	Gene therapies	
Week 8	Cell replacement therapies	
	Embryonic stem cells and xenotransplantation	Bioethics Ch. 8 (p. 116-136), "Therapeutic cloning: the moral status of embryos"
Week 9	Genetically modified or edited foods	Bioethics Ch. 17 (p. 321-347), "Food and energy security: GM food, biofuel, and the media"
	Gene drives	Bioethics Ch. 21 (p. 418-444), "The living and non-living environment: Spaceship Earth"
Week 10	Organismal cloning	Bioethics Ch. 7 (p. 95-115), "Reproductive cloning science and science fiction"
	De-extinction	Odenbaugh, Jay. (2023). "Philosophy and ethics of de-extinction". Cambridge Prisms: Extinction, 1, e7, 1–7 https://doi.org/10.1017/ext.2023.4

Course title
GNBT 100 Introduction to Biotechnology: From Cloning to Synthetic Biology (4 units)

Faculty contact hours
Lecture - 3 hours per week

Discussion - 1 hour per week

Catalog description

Introduces fundamental techniques used in biotechnology and the molecular biological foundations of biotechnology. Topics include gene cloning, the science of genetically modified organisms (GMOs), microbial and synthetic biology, the design of new purpose-driven organisms and microbial cell factories, biosensing, gene editing, and other contemporary topics in biotechnology.

Textbook

Introduction to Biotechnology (4th ed). Thieman & Palladino. *Pearson*.
ISBN-13: 9780137533220

Prerequisites

BIOL102

Grading

Three Exams	75%	(25% each)
Discussion quizzes	15%	
Biotech pitches	10%	

Learning objectives

- *Understand and define biotechnology, its subtypes, and applications.*
- *Define recombinant DNA technology and explain how it is used to clone genes and manipulate DNA.*
- *Diagram and design synthetic DNA constructs for recombinant protein production.*
- *Describe methods for making transgenic plants and mammals.*
- *Describe the impact of biotechnology on agriculture.*
- *Describe the development and importance of Golden Rice.*
- *Explain how to develop a new herbicide-resistant crop*
- *Explain how to develop a new insect-resistant crop*
- Describe the essential features of CRISPR, gene editing, and design constructs that could be used to edit specific genes.
- Understand the purpose of gene therapy, compare and contrast different gene therapy strategies, and recognize the limitations of gene therapy
- Define biosensing and design a strategy for creating a new biosensor
- Understand the foundations of genome sequencing and chemical DNA synthesis
- Explain what a synthetic genome is and how it is constructed.
- Identify and define specific problems that can be addressed with biotechnology.

Lectures

Week 1

Lecture 1: What is biotechnology?
Lecture 2: Recombinant DNA, insulin, the birth of gene-focused biotechnology.
Reading: Chapters 2 - 3

Week 2

Lecture 3: Synthetic Biology - design principles & applications
Lecture 4: Microbes as cell factories: biofuels and chemicals.
Reading: Chapter 4

Week 3

Exam 1
Lecture 7: Functional and Engineered Foods.
Reading: Chapter 5

Week 4

Lecture 8: Genetically modified organisms - foundations & methods (I)
Reading: Chapter 6

Week 5

Lecture 9: GMOs - Agricultural Applications (II)
Reading: Chapter 6, continued

Week 6

Lecture 10: CRISPR: foundations and biotechnological applications.
Lecture 11: GMOs in medicine: models & and genetic therapies.
Reading: Chapter 7, 11

Week 7:

Exam 2
Lecture 12: Designing life: synthetic genomes
Reading: Chapter 5

Week 8:

Lecture 13: Bioremediation and environmental biotechnology.
Lecture 14: Reproductive biotechnology
Reading: Chapter 9, 11

Week 9:

Lecture 15: mRNA vaccines & *in vitro* biotechnology
Lecture 16: Cell-based therapies
Reading: Chapter 11

Week 10:

Lecture 24: Student Biotechnology Pitches 1
Lecture 25: Student Biotechnology Pitches 2

Final exam

Course Title: Advanced Genetics

Prerequisites: Introduction to Genetics, BIOL 102

Faculty Contact Hours: 3 hours (3 hours lecture and 1 hour discussion)/week (4 units)

Course Catalog Description: This course is designed to teach students the process of associating genes with biological function. Topics will include genetics screens, gene characterization, and discovery of genetic pathways. Students will learn the rationale and design of experiments to investigate hypothesis driven questions using genetic approaches.

Textbook: Genetic Analysis (Genes, Genomes, and Networks in Eukaryotes). Third Edition Philip Meneely. ISBN: 9780198809906. $99 (https://global.oup.com/academic/product/genetic-analysis-9780198809906?cc=us&lang=en&)

Student Enrollment: ~ 40 students.

Desired Learning Outcomes:

1) Upon completion of this course, students would have gained comprehensive knowledge of the theory and design principle of genetic analysis and approaches.
2) Students will become comfortable in reading and analyzing primary literature.
3) Understanding the process and logic of genetic investigations.
4) Understand how genetic and molecular biology tools are used to understand gene function.
5) Understanding how genetic analysis can be used to address the causes of heritable diseases, and diagnostic tool development.

Grading:
30% Final Exam (Concept based and paper)
30% Midterm (Concept based and paper)
30% Homework Exercises/Assignment (Related to paper analysis, what is the rationale?, what are the controls?, etc).
10% Discussion Section

Grading Scale:
A+: 95-100
A: 90-94
A-: 87-89
B+: 84-86
B: 80-83
B-: 77-79
C+: 74-76
C: 70-73

C-: 67-69
D+: 64-66
D: 60-63
D-: 57-59
F: 56 and below

List of Topics and/or Reading Assignments by Week

Week 1 Bootcamp for analysis of scientific literature. Strategies for critical analysis of scientific literature (What are journals? How does peer-review work? How do we recognize what is trustworthy? What are ways to analyze a paper? What should be considered during that process? What are controls? How are experiments performed?).

Assigned reading: Pain E., How to (seriously) read a scientific paper. 2016 Science (doi: 10.1126/science.caredit.a1600047).

Week 2 Lecture on Concepts, identifying and classifying mutants. Assigned paper reading from references taken from the end of the chapter. Chapter 4 (4.1-4.4).

Assigned reading: Jürgens, G., et al., (1984). Mutations affecting the pattern of the larval cuticle in Drosophila melanogaster - II. Zygotic loci on the third chromosome. Wilhelm Roux's Archives of Developmental Biology, 193(5), 283-295.

Week 3 Lecture on Concepts, identifying and classifying mutants. Chapter 4 cont'd (4.5 - 4.7). Case Study 4.1. Assigned paper reading from references taken from the end of the chapter.

*Assigned reading: Nüsslein-Volhard, C., Wieschaus, E. Mutations affecting segment number and polarity in Drosophila. Nature **287**, 795–801.*

Week 4 Connecting phenotypes with DNA sequences, Chapter 5.

Assigned reading: Ng SB, et al., Exome sequencing identifies MLL2 mutations as a cause of Kabuki syndrome. Nat Genet. 2010 Sep;42(9):790-3.

Week 5 Mutant phenotypes and gene activity, Chapter 6.

Assigned reading: Gumienny TL, Savage-Dunn C. TGF-β signaling in C. elegans. In: WormBook: The Online Review of C. elegans Biology [Internet]. Pasadena (CA): WormBook; 2005-2018.

Week 6 Midterm 1, Reverse genetics, Chapter 7.

*Assigned reading: van der Weyden, L., White, J.K., Adams, D.J. et al. The mouse genetics toolkit: revealing function and mechanism. Genome Biol 2011 **12**, 224*

Week 7 Genome editing Chapter 8.

Assigned reading: Farboud B, Severson AF, Meyer BJ. Strategies for Efficient Genome Editing Using CRISPR-Cas9. Genetics. 2019 Feb;211(2):431-457.

Week 8 Genome-wide mutant screens Chapter 9.

Assigned reading: Walhout AJM. If two deletions don't stop growth, try three. Science. 2018 Apr 20;360(6386):269-270.

Week 9 Gene interactions: suppressors and synthetic enhancers Chapter 10.

Assigned reading: Richards K L et al. 2000. Structure function relationships in yeast tubulins. Molecular Biology of the Cell 11:1887-903

Week 10 Epistasis and genetic pathways Chapter 11.

Assigned reading: Avery, L and S. Wasserman, 1992. Ordering gene function: The interpretation of epistasis in regulatory hierarcgies. Trends in Genetics 8:312-16

Description of Course Activities:

Lecture (3 hours/week): One lecture will be focused on genetics concepts related to the assigned chapter study. Second lecture will be focused on the discussion of a case study.

Reading (4 hours/week): Reading assigned Chapter from textbook. Read one primary literature article assigned for the case study.

Homework Exercises/Assignments (1 hour/week): Relevant to assigned reading of literature. Practical application of paper analysis approaches. For example, draw an experimental set up, analyze a figure to determine the rationale, conclusions and controls, etc.

Discussion (1 hour/week): Discuss lecture and experimental design concepts.

Midterm and Final Exam: Part based on lecture concepts and part based on case studies. In addition, for the final exam, students will analyze an assigned paper not previously discussed in class.

Course title: Molecular Genetics Laboratory

Prerequisites: Prerequisite or concurrent enrollment: BIOL 107A, BIOL 102.

Faculty contact hours: 2 hours lecture; 6 hours lab (4 units)

Student enrollment: 2 sections (48 per lecture; 24 per lab)

Course catalog description (50 words): Reinforce important concepts in classical and molecular genetics through laboratory work in basic molecular biology and genetics including DNA manipulation techniques and cloning, gene mapping, and isolation and characterization of mutants in eukaryotic model systems.

Description of course activities:
Learn to integrate important concepts in classical and molecular genetics into an overall picture of genetic inheritance, the molecular basis of gene function and how gene function can be altered. This course is designed to introduce students to a wide range of molecular biology methods currently in use in both academic and industrial research laboratories. This includes theoretical and practical introduction to molecular biology basics including the properties of plasmids, recombinant DNA techniques, subcloning, bacterial transformation and selection, and the isolation of nucleic acids. Recent advances in biotechnology that have genetic implications and advances in genetic engineering technology will also be introduced. These core competencies in molecular biology will be applied to genetic mapping, mutant identification, and complementation in a eukaryotic system.

Students will learn the basics of experimental design and record keeping, data analysis, and how to present the results in the form of an oral presentation. The course will foster creative, critical thinking, and effective communication skills and prepare students to be contributing members of research labs. The following in-course activities are required: Instruction is based on a combination of lectures (2 hours), direct experimentation (two 3-hour labs). Each lab will begin with a short pre-laboratory quiz to reinforce understanding of key concepts and skills. Students will submit worksheets at the end of each lab period and will prepare one full-length lab report during the quarter. The course will include three in class exams (two midterms and a final).

Desired learning outcomes

1. Develop a basic understanding of inheritance patterns and experimental genetic tools used to isolate genes.

2. Establish a working knowledge of methods in Molecular Biology, including the ability to use standard laboratory equipment and methods frequently used in Molecular Biology research.
3. Practice record keeping and communicating their results in written and oral form.
4. Learn to exercise critical thinking skills to troubleshoot experiments and in the interpretation and reporting of scientific data.

Grading breakdown:

- 25% Final exam
- 25% Midterms (2)
- 20% Pre-lab quizzes
- 10% Lab worksheets
- 10% Oral presentation
- 10% Laboratory notebook

Grading scale:

A+: 98-100
A: 93-97
A-: 90-92
B+: 87-89
B: 83-86
B-: 80-82
C+: 77-79
C: 73:76
C-: 70-72
D+: 67-69
D: 63-66
D-: 60-62
F: 59 and below

List of topics and readings by week:

The lecture topics and laboratory activities for each lecture and lab meeting are detailed in the attached spreadsheet. Each quarter students will perform a series of molecular experiments to introduce basic molecular biology techniques. These experiments will be the same for each course offering and section. In addition, each section will carry out a genetics experiment. Here we have introduced two possible course-long experiments designed using the plant model system *Arabidopsis thaliana*. Similar concepts can be introduced using any eukaryotic model system and this aspect of the course is intended to be flexible to accommodate instructors with expertise in *C. elegans*, *S. cerevisiae*, *D. melanogaster*.

List of required text and readings:
Students will be provided with copies of Powerpoint presentations that are part of the lecture. A laboratory manual will be developed to include background information, required reagents, and a step by step guide to each laboratory experiment.

Description of course activities:
Lecture: (2 hours/week) Lectures will introduce fundamental concepts related to the molecular and genetics experiments to be performed each week.

Midterm and Final exam: Exams will be based on both lecture material and laboratory experiments. Pre-lab quizzes and lab worksheets will be designed to prepare students for these examinations.

Pre-lab quizzes: During the first 15 minutes of every lab period the students will take a short, 2-3 question quiz. This is meant to reinforce important concepts related to molecular biology techniques and/or genetic experiments introduced during lecture or the previous meeting.

Lab worksheets: Lab worksheets will include exercises to be completed during the current lab period. This will guide students through the completion of the daily molecular and/or genetics experiment. Lab worksheets will also serve to document student attendance and participation.

Lab notebooks: Throughout the course students will maintain a lab notebook. Best practices for record keeping will be introduced early on in the course. Students will update their lab notebook each meeting and include periodic peer evaluations.

Oral presentation: In teams of two, students will present a 12 minute presentation. Presentations will focus on an experiment performed during the course and include the following sections: introduction, materials and methods, and results.

Week/Lab	Lecture topic	Molecular biology experiments	Genetic experiments: *Arabidopsis thaliana* example	Alternative *Arabidopsis thaliana* experiments
1.1	Intro to Arabidopsis as a molecular/genetic model system	Intro to Molecular Biology: pipetman use and accurate measurement	Intro into root develop and cell types	Intro to Arabidopsis, root develop and lateral root formation
1.2	Introduction into elements of genetic change in plants: Transposable elements, T-DNAs, mutagens, overview of forward and reverse genetic screens	Discuss lab notebooks, purposes and best practices.	Intro into sterile technique laminar flow hood, Plate seeds (e.g. RML/rml1-1 on GSH+ and GSH- media, sensitive/insensitve to exogenous substance)	Intro into sterile technique, Plate various T2 lines on selection media
2.1	Basic molecular biology: Principles and theory of agarose gel electrophoresis; EtBr, markers; analysis of fragment sizes	Intro to Mol. Biol.: dilution, sterile technique for microorgs, plating/streaking bacteria, Mol Exp. 1: Agarose gel electrophoresis.	Introduction to GFP reporters and transgenic plants	Introduction to GFP reporters and transgenic plants
2.2	Restriction enzymes, mapping, plasmid properties (repl origin, selectable markers, polylinker); competent cells and transformation	Examine bacterial plates; Mol Exp 2: Restriction enzymes, plasmid mapping.	Examine segregation ratios for rml1-1 phenotype on GSH+/- plates	Perform selection of T2 lines for various reporters, determine resistant:sensitive ratios
3.1	Subcloning, ligation, directional cloning, blue-white selection	Mol Exp. 3: Transformation of competent cells; Mol Exp. 4: Subcloning- digest vectors and donor DNA	Plate seeds WT, SCR/scr-3 and SHR/shr-2 with pSCR reporter	Plate DR5:GFP, DR5:GFP alf4-1
3.2	Review genetic crosses and segregation ratios (phenotypic vs genotypic). Review subcloning procedures, plasmid properties, transformation	Mol Exp. 3: Count transformation results	Learn to use fluroescence dissecting microscope and take images, Introduce FIJI image analysis tools	Learn to use fluroescence dissecting microscope and take images, Introduce FIJI image analysis tools
4.1	**Exam 1**	Mol Exp. 4: Subcloning: run gel, cut out and freeze band	Examine segregation ratios for scr and shr plants, examine pSCR reporter expression, image root phenotypes and GFP	Examine LR phenotypes, examine pDR5 reporter expression, image root phenotypes and GFP, excise root tips to examine lateral root
4.2	Subcloning cont.; intro into modern types of cloning (Gateway recombination-based, Golden gate cloning, Gibson assembly, etc.	Mol Exp. 4: Purify fragments, set up ligations	Transplant mutants and WT siblings to soil	Count LRs to assess LR capacity
5.1	Review Meiosis, recombination with respect to crosses	Mol Exp. 4: transform ligations into competent cells (CaCl2, electroporate)	Analyze segregation and GFP image data	Analyze phenotypic and GFP image data
5.2	Principles of nucleic acid isolation; Intro to PCR: Theory and concepts	Review lab notebooks, share and give comments on a classmates lab notebook.	Review experimental procedures, discuss graphical presentation of data and use of statistical tests.	Review experimental procedures, discuss graphical presentation of data and use of statistical tests.
6.1	PCR methods: primers, reaction parameters. Applications: analysis of allelic variation	Mol Exp. 4: Analyze transformation results, start bacterial cultures for plasmid minipreps	Extract plant DNA, PCR for SCR alleles, plate SCR/scr-3 and SHR/shr-2 seeds	Plate DR5:GFP, DR5:GFP alf4-1 on auxin (NAA)
6.2	Review PCR methods and applications; discuss best practices for lab manuals, graphical representation of data and oral presentations.	Mol Exp. 4: Minipreps and restriction digestion of miniprep DNA	Analyze data and label pots with genotypes	Review data and graphical presentations in small groups
7.1	Review: introduction of DNA into plants - reveiw trangenic plants and transposons, introduce enhancer and gene traps	Finish minipreps/digests as needed	Perform shoot and root gravitropism experiments (short term, 2 hours) and image plates and plants turned 6 hours before the lab. (e.g. WT, scr-4, shr)	Examine LR phenotypes, examine pDR5 reporter expression, image root phenotypes and GFP, excise root tips to examine lateral root capacity
7.2	Review Reverse genetics concepts, Intro to targeted mutagensis: RNAi, CRISPR-Cas9-mediated	Mol Exp. 4: Electrophoresis and analysis of miniprep digests	Analyze gravitropism data	Count LRs to assess LR capacity
8.1	**Exam 2**	Mol Exp. 4: Continued, Electrophoresis and analysis of miniprep digests	Review data and graphical presentations in small groups	Analyze phenotypic and GFP image data
8.2	Introduce DNA repair mechanisms, homologous recombination in plants, why do difficult?	Mol Exp. 5: PCR amplification of human cheek cell DNA	Finalize lab notebook entries	Finalize lab notebook entries
9.1	Molecular mapping of transposon and T-DNA insertions; - inverse PCR .; Blast searches of sequence databases.	(TA runs class gel to analyze human cheek cell PCR results), Mol Exp. 5: Analyze human DNA PCR results;	Peer evaluations of two lab notebook entries	Peer evaluations of two lab notebook entries
9.2	Prepare for presentations		Presentations on lab topic of choice	Presentations on lab topic of choice
10.1	Prepare for presentations		Presentations on lab topic of choice	Presentations on lab topic of choice
10.2	**Exam 3/Final**		**Submit updated lab notebooks**	**Submit updated lab notebooks**
			*course can be adapted to use other organisms based on instructor's preference (e.g. *Drosophila melanogaster*, *Caenorhabditis elegans*)	

GNBT120: Analysis of Genomes Laboratory
Credit Hours: 4

Faculty contact hours: 1 hour lecture, 1 hour discussion, 6 hours laboratory

Prerequisite(s):

BIOL 005C with a grade of C- or better; BIOL 102; MATH 007B or MATH 009B or MATH 09HB.

Example course times:
Lecture + Lab: TR 1:00-4:50 PM
Discussion: F 1:00-1:50 PM

Course Catalog description:
Introduces the key computational approaches used in the analysis of genomes and their functional outputs. Topics include genome assembly and annotation, identification and analysis of genomic sequence variation, modern molecular mutant identification, quantitative trait mapping, genome-wide association mapping, mRNA and small RNA profiling, network analysis, and comparative genomics. Computer programming experience is not required.

Learning Objectives:
1. Develop an understanding of how genomics data is stored and manipulated in modern computing environments.
2. Gain experience analyzing data and recording results using the tools of computational biology.
3. Preform several of the common analyses used to understand genomes.

Grading breakdown:
Lab Assignments: 45%
Take Home Midterm: 25%
Take Home Final: 25%
Lecture Quizzes and Class participation: 5%

Course activities:
A series of topic videos will be made ahead of the course meeting, and the beginning of each meeting will be used to discuss the contents of the readings and the course videos. The remainder of the time will be devoted to working through the laboratory material. Graded material includes:
1) Weekly assignments which will include questions about the laboratory content that you can fill in as you work through the material.
2) Short quizzes that will cover the lecture material specifically.
3) A midterm and final exam, both of which will test your knowledge of the course material by requiring you to complete a series of related tasks.

Texts (Both O'Reilly and available for free for UC students):
Bioinformatics Data Skills, Vince Buffalo
R for Data Science, Hadley Wickham
Selected methods primers

Grading scale:
A+: 98-100
A: 93-97
A-: 90-92
B+: 87-89
B: 83-86
B-: 80-82
C+: 77-79
C: 73:76
C-: 70-72
D+: 67-69
D: 63-66
D-: 60-62
F: 59 and below

Enrollment:
25 students / lab

Example Schedule:

Week	Day	Topic	Reading
1	T	JetStream; Markdown; Intro Linux	Buffalo: p. 1 - 54 (Chapters 1-3)
1	R	Intro Linux Continued; Git	Buffalo: p. 67 - 97 (Chapter 5); 125 - 165 (Chapter 7)
1	F	Discussion: Linux, Git	
2	T	For Loops; BLAST I	Chapter 6 of Bioinformatics for Beginners
2	R	BLAST II	
2	F	Discussion: For loops, BLAST	
3	T	R: Intro	Buffalo: p. 175 - 206 (Start of Chapter 8 to Exploring Data

			Visually with ggplot2 1: Scatterplots and Densities); R for data science Chapters 27, 4
3	R	R: Tidyverse	R for data science Chapters 5, 6, 10, 18
3	F	Discussion: R	
4	T	Multiple Sequence Alignment and Tree Building	Chapter 9 of Bioinformatics for Beginners
4	R	R SNPS; ggplot	Buffalo: p. 207 - 224 (Chapter 8 Exploring Data Visually with ggplot2 1: Scatterplots and Densities to Using ggplot2 Facets); R for data science Chapters 3, 12
4	F	Discussion: Tidyverse, trees, etc	
5	T	GWAS	Genome-wide association studies Uffelmann et al.
5	R	Work on midterm	
5	F	Discussion: QTLs and GWAS	
6	T	Shiny Midterm Due @ 1:10	
6	R	Illumina Sequence Data: QC and mapping	Buffalo: p. 339 - 351 (Start of Chapter 10 to Indexed FASTA Files) Wikipedia FastQ U Mich SAM wiki
6	F	Discussion: Sequencing methods	
7	T	Illumina: SNPs and IGV	Buffalo p. 355 - 377 (Start of Chapter 11 to Pileups with samtools pileup)

7	R	Illumina: RNAseq	RNA Sequencing Data: Hitchhiker's Guide to Expression Analysis (up to single cell sequencing)
7	F	Discussion: Genetic variation	
8	T	Illumina: RNAseq	RNA Sequencing Data: Hitchhiker's Guide to Expression Analysis (remainder)
8	R	Motif discovery	How does DNA sequence motif discovery work? And What are DNA sequence motifs? D'haeseleer 2006
8	F	Discussion: Transcriptional Regulation I	
9	T	Clustering	Ospina et al. A Primer on Preprocessing, Visualization, Clustering, and Phenotyping of Barcode-Based Spatial Transcriptomics Data
9	R	Networks	Modeling and analysis of gene regulatory networks Karlebach 2008
9	F	Discussion: Transcriptional Regulation II	
10	T	Metagenomics	A Primer on Metagenomics Wooley et al. 2010
10	R	Metagenomics	
10	F	Discussion: Metagenomics	

Course title
GNBT 130: Genomes: Structure and Evolution

Course catalog description
Explores the content of genomes from microbes to plants to animals with emphasis on how they are analyzed and how they diversify and evolve.

Prerequisites
BIOL102

Faculty contact hours
Lecture – 3 hours per week

Learning Objectives
1. Develop a basic understanding of genome components and how they can differ among and between species.
2. Understand the technological advances central to genome analyses
3. Understand why transposable element content can greatly exceed gene content in eukaryotic genomes.
4. be able to think critically about how genomes have evolved complexity and mechanisms that diversify genes and fuel natural selection.
5. Understand how prokaryotes and eukaryotes protect the integrity of their genomes

Grading breakdown:
50% Discussion participation
30% Final exam
20% Class presentation

Grading scale:
A 90-100%
B 80-89%
C 70-79%
D 60-69%
F <60%

Description of course activities

Lectures (3 hours per week). Lectures will be partly didactic (reviewing concepts that students will encounter in the assigned readings) and partly student presentations of the papers.

Discussion (1 hour per week).

Reading. Reading assignments will be largely from the current literature including both primary research and review journal articles.

Homework. In advance of reading assignments, students will be given a list of questions – designed to test their understanding of concepts and provoke original thought. Questions will form the basis for in-class discussion. In addition, students present short background summaries of the paper(s) assigned for that week.

In class presentation (once/student). Students will select one of the weekly assigned papers and prepare a 15 min background presentation to be coordinated with the instructor.

Final exam. The final exam will be held in-person and will emphasize a holistic understanding of the genomes of life.

Course policies

Conduct

You are expected to be professional and courteous in your class interactions, whether online or in person. This includes:

- avoiding distracting other students from learning
- keeping comments and questions limited to the course subject matter
- being aware that there are a diversity of views, beliefs, backgrounds, and experiences within the class which may not be like your own; do your best to be respectful of others
- refraining from intentionally offensive (e.g. sexist, racist, political, etc.) comments or behavior
- maintaining academic integrity
- following campus health guidelines

Academic Integrity

All students are expected to maintain high standards for academic integrity. Students are strongly encouraged to review UCR policies for student conduct and integrity (https://conduct.ucr.edu/). If you have any questions, please ask the instructor before you act.

Plagiarism is the most common form of academic misconduct at UCR. It is the appropriation of another person's ideas, processes, results, or words without giving appropriate credit. This includes the copying of language, structure, or ideas of another and attributing (explicitly or implicitly) the work to one's own efforts. Plagiarism means using another's work without giving credit. Note that placing text within quotes and citing it is also not an acceptable substitution for providing original thoughts. For more information about plagiarism, see Academic Integrity Policies and Procedures. While you are encouraged to engage in discussions with other students during homework assignments, submissions for all graded assignments must be your own, original work. ChatGPT and other LLMs are not allowed for the development or revision of rough or final drafts. Plagiarism is a violation of academic integrity and will be handled accordingly. Any suspected cases of cheating, plagiarism, etc. will be forwarded directly to the Office of Student Conduct for their independent review and academic sanctions.

	Topic	Reading (to be selected from recent, current literature)
Weeks 1 & 2	Genomes overview: historical landmarks, parts list (TEs, non-coding)	(1) Girardini, KN, Olthof, AM, Kanadia, RN (2023) Introns: the dark matter of eukaryotic genomes. Front Genet 14: 1150212. (2) Hayward, A., Gilbert C (2022) Primer: transposable elements. Curr Biol. 32: R897-R911.
Week 3	Phage and other viral genomes	(1) Guzman-Solis, AA. et al (2023) A glimpse into the past: what ancient viral genomes reveal about human history. Ann Rev Virol. 10: 49-75. (2) Caetano-Anolles, G., Claverie, J-M, Nasir, A. (2023) A critical analysis of the current state of virus taxonomy. Front in Micro 14: 1240993.
Week 4	Bacterial Genomes	(1) Kirchberger PC, Schmidt, Ochman (2020) The ingenuity of bacterial genomes. Ann Rev Micro 74: 815-834.

		(2) Mayo-Munoz,D. et al (2023) A host of armor: Prokaryotic immune strategies against mobile genetic elements. Cell Reports. 42: July.
Week 5	Fungal Genomes	(1) Gryganskyi, AP et al (2023) Sequencing the genomes of the first terrestrial fungal lineages: what have we learned? Microorganisms 11:1830. (2) Zande, PV, Zhou, X., Selmecki, A. (2023) The dynamic fungal genome: polyploidy, aneuploidy and copy number variation in response to stress. Ann Rev Micro 77:341-361.
Week 6	Insect Genomes	(1) Rech, GE, et al (2022) Population-scale long-read sequencing uncovers transposable elements associated with gene expression variation and adaptive signatures in *Drosophila*. Nat Comm (https://doi.org/10.1038/s41467-022-29518-8) (2) San Jose, M., Dorenweerd, C., Rubinoff, D. (2023) Genomics reveals widespread hybridization across insects. Curr Opin Insect Sci. 58: 101052
Week 7	Plant Genomes	(1) Sun, Y et al (2022) Twenty years of plant genome sequencing: achievements and challenges. Trends Plt Sci. (https://doi.org/10.1016/j.tplants.2021.10.006) (2) Liu, P. et al (2022) The epigenetic control of the transposable element life cycle in plant genomes and beyond. Ann Rev Genet 56: 63-87.
Week 8	Mammalian/Human Genomes	(1) Garg, KM et al (2023) Next generation sequencing revolutionizes organismal biology in bats. Jour. Evol Biol 91: 391-404 (2) Wang, J, Lu, X, Zhang, W, Liu G-H (2023) Endogenous retroviruses in development and health. Trends Micro. (https://doi.org/10.1016/j.tim.2023.09.006)
Week 9	Polyploid Genomes	(1) Mason, AS, Wendel, JF (2020) Homoeologous exchanges, segmental allopolyploidy, and polyploid genome evolution. Front. Genet. 11: 1014. (2) Sanz-Gomez, N. et al (2023) Whole genome doubling as a source of cancer: how, when, where, and why? Front. Cell Dev Biol. 11:1209136.
Week 10	Future directions	(1) Escudeiro, P, Henry CS, Dias RPM (2022) Functional characterization of prokaryotic dark matter. Curr Res Microb Sci 3. 100159 (2) Yadav, D. et al (2023) Next-generation sequencing transforming clinical practice and precision medicine. Clin.Chim.Acta. Oct 13:117568.

APPENDIX II. COURSE CATALOG DESCRIPTIONS

1. Lower-division requirements

BIOL 005A Introduction to Cell and Molecular Biology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 05LA with a grade of C- or better, may be taken concurrently or BIOL 020 with a grade of C- or better, may be taken concurrently; CHEM 001A with a grade of C- or better, may be taken concurrently, CHEM 01LA with a grade of C- or better, may be taken concurrently or CHEM 01HA with a grade of C- or better, may be taken concurrently, CHEM 1HLA with a grade of C- or better, may be taken concurrently or CHEM 002A with a grade of C- or better, may be taken concurrently, CHEM 02LA with a grade of C- or better, may be taken concurrently. An intensive course designed to prepare for upper-division courses in cell and molecular biology. Covers biochemical, structural, metabolic, and genetic aspects of cells. Required for Biology majors; recommended for science majors desiring an introduction to biology.

BIOL 005B Introduction to Organismal Biology 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): BIOL 005A with a grade of C- or better; BIOL 05LA with a grade of C- or better or BIOL 020 with a grade of C- or better; CHEM 001A, CHEM 01LA or CHEM 01HA, CHEM 1HLA or CHEM 002A, CHEM 02LA; CHEM 001B, may be taken concurrently, CHEM 01LB, may be taken concurrently or CHEM 01HB, may be taken concurrently, CHEM 1HLB, may be taken concurrently or CHEM 002B, may be taken concurrently, CHEM 02LB, may be taken concurrently. An intensive course designed to prepare for upper-division courses in organismal biology. Covers developmental biology, physiology, and regulation at the level of the organism. Required for Biology majors; recommended for science majors desiring an introduction to biology.

BIOL 005C Introductory Evolution and Ecology 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): BIOL 005A with a grade of C- or better; BIOL 05LA with a grade of C- or better or BIOL 020 with a grade of C- or better; BIOL 005B with a grade of C- or better; MATH 009A with a grade of C- or better or MATH 09HA with a grade of C- or better or MATH 007A with a grade of C- or better; CHEM 001C, may be taken concurrently, CHEM 01LC, may be taken concurrently or CHEM 01HC, may be taken concurrently, CHEM 1HLC, may be taken concurrently or CHEM 002C, may be taken concurrently, CHEM 02LC, may be taken concurrently. An intensive introduction to the subjects of evolution and ecology. Covers population dynamics, community ecology, population genetics, and evolutionary theory. Recommend- ed for science majors desiring an introduction to biology. Students who take equivalent first-year biology at another institution may enter directly into BIOL 005C without critical handicap.

BIOL 05LA Introduction to Cell and Molecular Biology Laboratory 1 Laboratory, 3 hours. Prerequisite(s): BIOL 005A (may be taken concurrently); consent of instructor is required for students repeating the course. An introduction to laboratory exercises on fundamental principles of and techniques in cell and molecular biology. Illustrates the experimental foundations of the topics covered in BIOL 005A. Credit is not awarded for BIOL 05LA if it has already been awarded for BIOL 020.

BIOL 020 Dynamic Genome 2 Laboratory, 6 hours. Prerequisite(s): CHEM 001A with a grade of C- or better, may be taken concurrently, CHEM 01LA with a grade of C- or better, may be taken concurrently or CHEM 01HA with a grade of C- or better, may be taken concurrently, CHEM 1HLA with a grade of C- or better, may be taken concurrently or CHEM 002A with a grade of C- or better, may be taken concurrently, CHEM 02LA with a grade of C- or better, may be taken concurrently; MATH 009A, may be taken concurrently or MATH 09HA, may be taken concurrently or MATH 007A, may be taken concurrently; restricted to class level standing of freshman. Introduces computational and experimental approaches in investigating the genomes of plants and animals. Explores scientific discovery using the tools of bioinfor-

matics and genomics. Includes participation in research projects being conducted on campus. Credit is awarded for one of the following BIOL 020 or BIOL 05LA.

CHEM 001A General Chemistry 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): concurrent enrollment in CHEM 01LA; MATH 005A with a grade of C- or better or MATH 006A with a grade of C- or better or CHEM 001W with a grade of S or better or CHEM 001 with a grade of S or better or MATH 007A with a grade of C- or better or MATH 007B with a grade of C- or better or MATH 009A with a grade of C- or better or MATH 009B with a grade of C- or bet- ter or MATH 006B with a grade of C- or better or MATH 009C with a grade of C- or better; or a score of 3, 4, or 5 on the College Board Advanced Placement Chemistry Examination or Advanced Placement Calculus Examination or a passing score on the California Chemistry Diagnostic Test or a score on the Mathematics Advisory Exam sufficient for placement in MATH 007A or MATH 009A. An introduction to the basic principles of chemistry. Instructional methods are either in-person lectures or virtual online lectures. Credit is awarded for one of the following CHEM 001A, CHEM 002A, or CHEM 01HA.

CHEM 001B General Chemistry 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): concurrent enrollment in CHEM 01LB; CHEM 001A with a grade of C- or better, CHEM 01LA with a grade of C- or better or CHEM 01HA with a grade of C- or better, CHEM 1HLA with a grade of C- or better or CHEM 002A with a grade of C- or better, CHEM 02LA with a grade of C- or better. An introduction to the basic principles of chemistry. Provides lectures either in person or in a virtual online environment, depending on section offerings. Credit is awarded for one of the following CHEM 001B, CHEM 002B, or CHEM 01HB.

CHEM 001C General Chemistry 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): con- current enrollment in CHEM 01LC; CHEM 001B with a grade of C- or better or CHEM 01HB with a grade of C- or better; CHEM 01LB with a grade of C- or better or CHEM 1HLB with a grade of C- or better or CHEM 002B with a grade of C- or better, CHEM 02LB with a grade of C- or better. An introduction to the basic principles of chemistry. Provides lectures either in person or in a virtual online environment, depending on section offerings. Credit is awarded for one of the following CHEM 001C, CHEM 002C, or CHEM 01HC.

CHEM 01LA General Chemistry Laboratory 1 Laboratory, 3 hours. Prerequisite(s): concurrent enrollment in CHEM 001A; MATH 005A with a grade of C- or better or MATH 006A with a grade of C- or better or CHEM 001W with a grade of S or better or CHEM 001 with a grade of S or better or MATH 007A with a grade of C- or better or MATH 007B with a grade of C- or better or MATH 009A with a grade of C- or better or MATH 009B with a grade of C- or better or MATH 006B with a grade of C- or bet- ter or MATH 009C with a grade of C- or better; or a score of 3, 4, or 5 on the College Board Advanced Placement Chemistry Examination or Advanced Placement Calculus Examination or a passing score on the California Chemistry Diagnostic Test or a score on the Mathematics Advisory Exam sufficient for placement in MATH 007A or MATH 009A. An introduction to laboratory principles and techniques related to lecture topics in CHEM 001A. Credit is awarded for one of the following CHEM 01LA, CHEM 02LA, or CHEM 1HLA.

CHEM 01LB General Chemistry Laboratory 1 Laboratory, 3 hours. Prerequisite(s): concurrent enrollment in CHEM 001B; CHEM 001A with a grade of C- or better or CHEM 01HA with a grade of C- or better or CHEM 01LA with a grade of C- or better or CHEM 1HLA with a grade of C- or better or CHEM 002A with a grade of C- or better or CHEM 02LA with a grade of C- or better. An introduction to laboratory principles and techniques related to lecture topics in CHEM 001B. Credit is awarded for one of the following CHEM 01LB, CHEM 02LB, or CHEM 1HLB.

CHEM 01LC General Chemistry Laboratory 1 Laboratory, 3 hours. Prerequisite(s): concurrent enrollment in CHEM 001C; CHEM 001B with a grade of C- or better or CHEM 01HB with a grade of C- or better or

CHEM 002B; CHEM 01LB or CHEM 1HLB or CHEM 02LB. An introduction to laboratory principles and techniques related to lecture topics in CHEM 001C. Credit is awarded for one of the following CHEM 01LC, CHEM 02LC, or CHEM 1HLC.

CHEM 008A Organic Chemistry 3 Lecture, 3 hours. Prerequisite(s): concurrent enrollment in CHEM 08LA; CHEM 001C with a grade of C- or better, CHEM 01LC with a grade of C- or better or CHEM 01HC with a grade of C- or better, CHEM 1HLC with a grade of C- or better or CHEM 002C with a grade of C- or better, CHEM 02LC with a grade of C- or better. Covers mod- ern organic chemistry including hydrocarbon structure and nomenclature, stereochemistry, and reaction mechanisms. Provides lectures either in person or in a virtual online environment, depending on section offerings. Credit is awarded for one of the following CHEM 008A or CHEM 08HA.

CHEM 008B Organic Chemistry 3 Lecture, 3 hours. Prerequisite(s): concurrent enrollment in CHEM 08LB; CHEM 008A with a grade of C- or better, CHEM 08LA with a grade of C- or better or CHEM 08HA with a grade of C- or better, CHEM 08HLA with a grade of C- or better. Covers modern organic chemistry including structural determination via spectroscopic analysis, reactivity, reaction mechanisms, and multistep organic synthesis. Credit is awarded for one of the following CHEM 008B or CHEM 08HB.

CHEM 008C Organic Chemistry 3 Lecture, 3 hours. Prerequisite(s): concurrent enroll- ment in CHEM 08LC; CHEM 008B with a grade of C- or better, CHEM 08LB with a grade of C- or better or CHEM 08HB with a grade of C- or better, CHEM 08HLB with a grade of C- or better. Covers modern organic chemistry and chemical biology including reactivity and synthesis. Also includes reaction mechanisms and the chemistry of carbohydrates, lipids, nucleic acids, amino acids, and proteins. Credit is awarded for one of the following CHEM 008C or CHEM 08HC.

CHEM 08LA Organic Chemistry Laboratory 1 Laboratory, 4 hours. Prerequisite(s): concurrent enrollment in CHEM 008A; CHEM 001C with a grade of C- or better, CHEM 01LC with a grade of C- or better or CHEM 01HC with a grade of C- or better, CHEM 1HLC with a grade of C- or better or CHEM 002C with a grade of C- or better, CHEM 02LC with a grade of C- or better. An introduction to laboratory techniques of purification, isolation, synthesis, reactions, and spectroscopic analysis. Credit is awarded for one of the following CHEM 08LA or CHEM 08HLA.

CHEM 08LB Organic Chemistry Laboratory 1 Laboratory, 4 hours. Prerequisite(s): CHEM 008A and CHEM 08LA or CHEM 08HA and CHEM 08HLA with grades of “C-” or better; concurrent enrollment in CHEM 008B or a grade of “C-” or better in CHEM 008B. An introduction to laboratory techniques of purification, isolation, synthesis, reactions, and spectroscopic analysis. Credit is awarded for only one of CHEM 08LB or CHEM 08HLB.

CHEM 08LC Organic Chemistry Laboratory 1 Laboratory, 4 hours. Prerequisite(s): CHEM 008B and CHEM 08LB or CHEM 08HB and CHEM 08HLB with grades of “C-” or better; concurrent enrollment in CHEM 008C or a grade of “C-” or better in CHEM 008C. An introduction to laboratory techniques of purification, isolation, synthesis, reactions, and spectroscopic analysis. Credit is awarded for only one of CHEM 08LC or CHEM 08HLC.

GNBT 010 Genetics and Society 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none; BIOL 005A recommended. Explores how genetic discoveries and technology are shaping human society on issues ranging from healthcare to reproduction to engineering food and the environment. Science concepts are

introduced at a level accessible to non-majors. Emphasizes bioethical analyses and considers the cost-benefit tradeoffs of genetic advances.

MATH 007A Calculus For Life Sciences 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 005A or MATH 006B. Introduction to the differential calculus of functions of one variable for students majoring in Life Sciences. Credit is awarded for one of the following MATH 007A, MATH 005B, MATH 009A, or MATH 09HA.

MATH 007B Calculus For Life Sciences 4 Discussion, 1 hour; lecture, 3 hours. Prerequi- site(s): MATH 007A with a grade of C- or better or MATH 009A with a grade of C- or better or MATH 09HA with a grade of C- or better. Introduction to the integral calculus of functions of one variable. For Life Sciences majors. Credit is awarded for one of the following MATH 007B, MATH 005C, MATH 009B, or MATH 09HB.

MATH 009A First-Year Calculus 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 005A with a grade of C- or better or MATH 006B. Introduction to the differential calculus of functions of one variable. Credit is awarded for one of the following MATH 009A, MATH 005B, MATH 007A, or MATH 09HA.

MATH 009B First Year Calculus 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 005B with a grade of C- or better or MATH 009A or MATH 09HA. Introduction to the integral calculus of functions of one variable. Credit is awarded for one of the following MATH 009B, MATH 005C, MATH 007B, or MATH 09HB.

MATH 09HA First-Year Honors Calculus 4 Discussion, 1 hour; lecture, 3 hours. Prerequisite(s): admission to University Honors. Honors course corresponding to MATH 009A. Honors course corresponding to MATH 009A for students with strong mathematical backgrounds. Introduces the differential calculus of functions of one variable. Emphasis is on theory and rigor Satisfactory(S) or No Credit(N/C) is not available. Credit is awarded for one of the following MATH 09HA, MATH 005B, MATH 007A, or MATH 009A.

MATH 09HB First-Year Honors Calculus 4 Discussion, 1 hour; lecture, 3 hours. Prerequi- site(s): MATH 09HA with a grade of B or better; admission to University Honors. Honors course corresponding to MATH 009B. Honors course corresponding to MATH 009B for students with strong mathematical backgrounds. Introduces the integral calculus of functions of one variable. Emphasis is on theory and rigor. Credit is awarded for one of the following MATH 09HB, MATH 005C, MATH 007B, or MATH 009B.

PHYS 002A General Physics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): concurrent enrollment in PHYS 02LA; MATH 007A with a grade of C- or better or MATH 009A with a grade of C- or better or MATH 09HA with a grade of C- or better. Covers topics in classical mechanics including Newton's laws of motion in one and two dimensions; work, energy, and conservation of energy; momentum and collisions; rotational motion; and orbital motion. For biological sciences students. Credit is awarded for one of the following PHYS 002A, PHYS 02HA, PHYS 040A, or PHYS 040HA.

PHYS 002B General Physics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 007B or MATH 009B or MATH 09HB (may be taken concurrently); PHYS 002A or PHYS 02HA with a grade of "C-" or better; concur- rent enrollment in PHYS 02LB or a grade of "C-" or better in PHYS 02LB is required. Covers topics in mechanics, thermodynamics, and electromagnetism. Includes fluid mechanics; temperature and heat; the laws of thermodynamics; kinetic theory of gases; electric fields and potentials; current and DC circuits; capacitance and inductance; magnetism; and Faraday's law. For biological sciences students.

Credit is not awarded for PHYS 002B if it has already been awarded for PHYS 02HB; PHYS 040B or PHYS 040HB and PHYS 040C or PHYS 040HC; or PHYS 041B.

PHYS 002C General Physics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PHYS 002B or PHYS 02HB with a grade of "C-" or better; concurrent enrollment in PHYS 02LC or a grade of "C-" or better in PHYS 02LC. Covers topics in waves and modern physics. Includes harmonic oscillations; mechanical and electromagnetic waves; geometrical optics; reflection, refraction, interference, diffraction, and polarization; and quantum, atomic, and nuclear physics. For biological sciences students. Credit is not awarded for PHYS 002C; if it has already been awarded for PHYS 02HC; or PHYS 041C.

PHYS 02LA General Physics Laboratory 1 Laboratory, 3 hours. Prerequisite(s): concurrent enrollment or a grade of "C-" or better in PHYS 002A or PHYS 02HA. Illustrates the experimental foundations of physics presented in PHYS 002A. Covers the basic principles of classical mechanics. Credit awarded for only PHYS 02LA or PHYS 02HLA.

PHYS 02LB General Physics Laboratory 1 Laboratory, 3 hours. Prerequisite(s):PHYS 002A and PHYS 02LA or PHYS 02HA and PHYS 02HLA with grades of "C-" or better; concurrent enrollment or a grade of "C-" or better in PHYS 002B or PHYS 02HB. Illustrates the experimen- tal foundations of physics presented in PHYS 002B. Covers the basic principles of fluid and rotational mechanics, temperature, heat, and electromagnetism. Credit is awarded for only one of PHYS 02LB or PHYS 02HLB.

PHYS 02LC General Physics Laboratory 1 Laboratory, 3 hours. Prerequisite(s): PHYS 002B and PHYS 02LB or PHYS 02HB and PHYS 2HLB with a grade of "C-" or better; concurrent enrollment or a grade of "C-" or better in PHYS 002C or PHYS 02HC Illustrates the experimental foundations of physics presented in PHYS 002C. Covers the basic principles of oscillations, waves, optics, and radioactivity. Credit is awarded for only one of PHYS 02LC or PHYS 02HLC.

PHYS 040A General Physics 5 Lecture, 3 hours; discussion, 1 hour; laboratory, 3 hours. Prerequisite(s): MATH 007A or MATH 009A or MATH 09HA with a grade of "C-" or better; MATH 007B or MATH 009B or MATH 09HB with a grade of "C-" or better (MATH 009B or MATH 09HB may be taken concurrently). Designed for engineering and physical sciences students. Covers topics in classical mechanics including Newton's laws of motion; friction; circular motion; work, energy, and conservation of energy; dynamics of particle systems; colli- sions; rigid-body motion; torque; and angular momentum. Laboratories provide exercises illustrating experimental foundations of physical principles and selected applications. Credit is not awarded for PHYS 040A if it has already been awarded for PHYS 002A, PHYS 02HA, PHYS 040HA, or PHYS 041A.

PHYS 040B General Physics 5 Lecture, 3 hours; discussion, 1 hour; laboratory, 3 hours. Prerequisite(s): MATH 009C or MATH 09HC (may be taken concurrently); PHYS 040A or PHYS 040HA with a grade of "C-" or better. Designed for engineering and physical sciences students. Covers topics in mechanics and thermodynamics including elasticity; oscil- lations; gravitation; fluids; mechanical waves and sound; temperature, heat, and the laws of thermodynamics; and the kinetic theory of gases. Laboratories provide exercises illustrating the experimental foundations of physical principles and selected applications. Credit is awarded for only one of PHYS 040B or PHYS 040HB.

PHYS 040C General Physics 5 Lecture, 3 hours; discussion, 1 hour; laboratory, 3 hours. Prerequisite(s): MATH 009C or MATH 09HC; PHYS 040B or PHYS 040HB with a grade of "C-" or better. Designed for engineering and physical sciences students. Covers topics in electricity and magnetism including electric fields and potential; Gauss' law; capacitance; magnetic fields; Ampere's law; Faraday's law and induction;

electromagnetic oscillations; dc and ac current; and circuits. Laboratories provide exercises illustrating the experimental foundations of physical principles and selected applications. Credit is awarded for only one of PHYS 040C, PHYS 040HC, PHYS 002B, PHYS 02HB, or PHYS 041B.

STAT 010 Introduction to Statistics 5 Lecture, 3 hours; discussion, 1 hour; laboratory, 3 hours. Prerequisite(s): MATH 005A or MATH 006B or MATH 007A or MATH 009A or MATH 09HA. A general introduction to descriptive and inferential statistics. Topics include histograms; descriptive statistics; probability; normal and binomial distributions; sampling distributions; hypothesis testing; and confidence intervals. Credit is awarded for one of the following STAT 010 or STAT 008.

1. Upper-division requirements (core)

BCH 100 Introductory Biochemistry 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A with a grade of C- or better; CHEM 08HB with a grade of C- or better or CHEM 008B with a grade of C- or better; CHEM 08LB with a grade of C- or better or CHEM 08HLB with a grade of C- or better. Introduction to the biochemistry of living organisms based on a study of the structure, function, and metabolism of small molecules and macromolecules of biological significance. Examines selected animals, plants, and microorganisms to develop a general understanding of structure-function relationships, enzyme action, regulation, bioenergetics, and intermediary metabolism. Credit is awarded for one of the following BCH 100 or BCH 100H. Credit is not awarded for BCH 100 if a grade of "C-" or higher has been awarded previously in BCH 110A or BCH 110HA or BCH 110B or BCH 110HB or BCH 110C or BCH 110HC.

BCH 110A General Biochemistry 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A with a grade of "C-" or better; CHEM 008C and CHEM 08LC or CHEM 08HC and CHEM 08HLC with grades of "C-" or better. Considers the structure and function of biological molecules including proteins, carbohydrates, lipids, and nucleic acids. Credit is awarded for only one of BCH 110A or BCH 110HA.

BIOL 102 Introductory Genetics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A, BIOL 020 or BIOL 05LA, and BIOL 005B with grades of "C-" or better. An introductory course that includes classical Mendelian genetics, linkage and recombination, sex- linked traits, cytogenetics, developmental genetics, and molecular genetics. Also includes some probability theory and statistics.

BIOL 107A Molecular Biology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A, BIOL 005B, BIOL 005C; CHEM 001C or CHEM 01HC; CHEM 008C and CHEM 08LC, or CHEM 08HC and CHEM 8HLC; MATH 007B or MATH 009B or MATH 09HB; PHYS 002C or PHYS 02HC; PHYS 02LC or PHYS 02HLC; BCH 100 or BCH 110A or BHC 110HA. The study of the structure and function of the genetic material, including DNA structure, DNA replication and recombination, regulation of gene expression, and protein synthesis. Examines both prokaryotic and eukaryotic systems including contemporary recombinant DNA technology and applications of molecular cloning procedures. Credit is not awarded for BIOL 107A if it has already been awarded for BCH 110C.

BCH 110C General Biochemistry 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BCH 110A or BCH 110HA with a grade of "C-" or better, BIOL 102 or consent of instructor. BCH 110B or BCH 110HB is highly recommended. Considers regulation of gene expression, protein synthesis, chromatin structure, genome replication, recombination, and repair. Examines both prokaryotic and eukaryotic systems,

including recombinant DNA technology, protein engineering, and applications to molecular medicine. Credit is not awarded for BCH 110C if it has already been awarded for BCH 110HC or BIOL 107A.

BCH 110HC Honors General Biochemistry 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BCH 110A or BCH 110HA with a grade of "C-" or better. BCH 110B or BCH 110HB is highly recommended. Honors course corresponding to BCH 110C. Considers regulation of gene expression, protein synthesis, chromatin structure, genome replication, recombination, and repair. Examines both prokaryotic and eukaryotic systems, including recombinant DNA technology, protein engineering, and ap- plications to molecular medicine. Credit is not awarded for BCH 110HC if it has already been awarded for BCH 110C or BIOL 107A.

GNBT 100 Biotechnology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL102 with a grade of "C-" or better. Introduces fundamental techniques used in biotechnology and the molecular biological foundations of biotechnology. Topics include gene cloning, the science of genetically modified organisms (GMOs), microbial and synthetic biology, the design of new purpose-driven organisms and microbial cell factories, biosensing, gene editing, and other contemporary topics in biotechnology.

GNBT 110 Advanced Genetics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL102 with a grade of "C-" or better. Teaches the process of associating genes with biological function. Topics include genetics screens, gene characterization, and discovery of genetic pathways. Examines the rationale and design of experiments to investigate hypothesis-driven questions using genetic approaches.

GNBT114 Molecular Genetics Laboratory 4 Lecture, 2 hours; laboratory, 6 hours. Prerequisite(s): BIOL102, with grade of "C-" or better; BIOL107A, may be taken concurrently. Reinforces important concepts in classical and molecular genetics through laboratory work in basic molecular biology and genetics including DNA manipulation techniques and cloning, gene mapping, and isolation and characterization of mutants in eukaryotic model systems.

2. Upper-division requirements and electives for all tracks

BCH 185 Epigenetics in Development and Disease 4 Lecture, 3 hours; discussion, 1 hour; extra reading, 2 hours. Prerequisite(s): BCH 110C with a grade of C- or better or BCH 110HC with a grade of C- or better or BIOL 107A with a grade of C- or better; or equivalents. Examines epigenetic regulation of gene expression in mammalian development and human disease. Covers the roles of epigenetic mechanisms in normal homeostasis including mammalian embryogenesis, memory formation, and trans- generational inheritance. Addresses aberrant epigenetic control in major human disorders including cancer, neurological disorders, and systemic disease. Explores epigenetics in regenerative medicine.

BCH 188 Fundamentals of Genomics Technologies 3 Lecture, 3 hours. Prerequisite(s): BCH 110C with a grade of C- or better or BCH 110HC with a grade of B- or better; BIOL 107A with a grade of C- or better; or equivalent. A systematic overview of leading and emerging genomics technologies. Emphasizes the biochemical and molecular methods behind different genomic technologies and various applications in areas such as functional genomics, developmental biology, metagenomics, and clinical diagnostics. Course appropriate for biochemistry or other biological sciences majors.

BIOL 105 Evolution 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005C with a grade of "C-" or better, BIOL 102, CHEM 008C and CHEM 08LC, or CHEM 08HC and CHEM 08HLC, MATH 007B or MATH 009B or MATH 09HB; PHYS 002C or PHYS 02HC; PHYS 02LC or PHYS 02HLC, BCH 100 or BCH 110A or BCH 110HA, one course in statistics; or consent of instructor. Covers the causal interpretation

of organic diversity and adaptation. Topics include inference of evolutionary change from the fossil record and from genomic and molecular patterns; microevolution and macroevolution; systematics and the species problem; and natural selection, drift, and other forces of evolution.

BIOL 107B Advanced Molecular Biology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 107A or BCH 110C or BCH110HC or equivalents. An advanced treatment of the functional architecture of genetic material. Topics include genome structure and chromosome organization, DNA replication and gene expression, cloning organisms, molecular medicine, protein engineering, and application of modern molecular biology to agricultural problems. Coverage of each topic includes discussion of the impact of the emergent molecular technology on society.

BIOL 108 Population Genetics and Genomics 4 Lecture, 3 hour; discussion and demonstration, 1 hour. Prerequisite(s): BIOL 005A, BIOL 005B, BIOL 005C, CHEM 001C or CHEM 01HC, CHEM 008C and CHEM 08LC, or CHEM 08HC and CHEM 08HLC, MATH 007B or MATH 009B or MATH 09HB, PHYS 002C or PHYS 02HC, PHYS 02LC or PHYS 02HLC, one course in statistics. A study of factors influencing genomic variation in biological populations. Topics include the effects of natural selection and genetic drift on genetic variation, detecting adaptive change from genomic data, why genetic diseases and cancers persist, the evolution of co-operation, adaptation to patho- gens and to a changing environment, and the genetic challenges faced by small conserved populations.

BIOL 115 Human Genetics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 102; BCH 100 or BCH 110A or BCH 110HA. An introduction to human genetics. Topics include human gene organization, chromosome structure, chromosomal aberrations, patterns of single-gene inheritance, multifactorial disorders, developmental biology in medicine, cancer genetics, prenatal diagnosis, personalized health care, gene therapy, and ethical issues in medical genetics.

BIOL 118 Methods in Molecular Ecology and Evolution 4 Lecture, 2 hours; discussion, 1 hour; laboratory, 3 hours. Prerequisite(s): BIOL 005C with a grade of C- or better; CHEM 008C or CHEM 08HC; CHEM 08LC or CHEM 08HLC; MATH 007B or MATH 009B or MATH 09HB; PHYS 002C or PHYS 02HC, PHYS 02LC or PHYS 02HLC; STAT 010; BCH 100 or BCH 110A or BCH 110HA. Covers theory, techniques, and analytical methods for interpreting patterns of genetic variation based on current high-throughput DNA sequencing technology. Topics include genotype calling, analysis of population structure, genome-wide association studies, and phylogenetic inference using modern computational methods. Includes laboratory techniques for sequencing library preparation.

BIOL 119 Introduction to Genomics and Bioinformatics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005C with a grade of C- or better; BIOL 102; CHEM 001C or CHEM 01HC; CHEM 008C or CHEM 08HC; CHEM 08LC or CHEM 08HLC; MATH 007B or MATH 009B or MATH 09HB; PHYS 002C or PHYS 02HC; PHYS 02LC or PHYS 02HLC; BCH 100 or BCH 100H or BCH 110A or BCH 110HA. An introduction to the science of genomics and bioinformatics. Includes genome sequencing; database techniques; structural, comparative, and evolutionary genomics; and microarray analysis.

BPSC/BIOL 104 Foundations of Plant Biology 4 Lecture, 3 hours; laboratory, 3 hours. Prerequi- site(s): BIOL 005C. A study of the plant world from cells to ecosystems. Examines the structure and function of organisms from the major plant groups and their role in the biosphere. The laboratory explores the unique properties of plants. Cross-listed with BIOL 104.

BPSC/CBNS 109 Epigenetics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 102. Introduction to mechanisms that cause a heritable change in phenotype without a change in the genetic

code. Covers DNA modifications, histone modifications, and noncoding RNAs that influence the expression, maintenance, and inheritance of traits. Discusses impacts of epigenetics on multicellular life such as learning, memory, disease, and crosstalk with environments. Cross-listed with CBNS 109.

BPSC 135 Plant Cell Biology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005C; BCH 100 or BCH 110A; or consent of instructor. Explores concepts of dynamic plant cell structures and functions as revealed by modern technologies such as genetic manipulation and live-imaging of cellular structures and molecules.

BPSC/BIOL 143 Plant Physiology 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): BIOL 005A, BIOL 005B, BIOL 005C, CHEM 001C or CHEM 01HC, CHEM 008C and CHEM 08LC or CHEM 08HC and CHEM 08HLC, MATH 007B or MATH 009B or MATH 09HB, PHYS 002C or PHYS 02HC, PHYS 02LC or PHYS 02HLC, BCH 100 or BCH 110A or BCH 110HA (BCH 100 or BCH 110A or BCH 110HA may be taken concurrently), BIOL 104/BPSC 104; or consent of instructor. A survey of the fundamental principles of plant physiology including photosynthesis, respiration, water relations, mineral nutrition, growth, morphogenesis, plant hormones, dormancy, and senescence. Cross-listed with BIOL 143.

BPSC/BIOL 148 Quantitative Genetics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A, BIOL 05LA; BIOL 005B; BIOL 005C; BIOL 102; CHEM 001C or CHEM 01HC; CHEM 008C, CHEM 08LC or CHEM 08HC, CHEM 08HLC; MATH 007B or MATH 009B or MATH 09HB; PHYS 002C or PHYS 02HC, PHYS 02LC or PHYS 02HLC; BCH 100 or BCH 110A or BCH 110HA; STAT 011. Examines approaches to studying the genetic basis of polygenic metric traits. Includes types of gene action, partitioning of variance, response to selection, and inferring the number and location of quantitative trait loci. Cross-listed with BIOL 148.

BPSC 149 Nanobiotechnology 2 Lecture, 1 hour; discussion, 1 hour. Prerequisite(s): BIOL 005C; BIOL 102; CHEM 008C or CHEM 08HC, CHEM 08LC or CHEM 08HLC; PHYS 002C or PHYS 02HC, PHYS 02LC or PHYS 02HLC or PHYS 040C or PHYS 040HC; restricted to class level standing of junior, or senior; or consent of instructor. An Introduction to fundamental concepts of the emergent field of nanobiotechnology and its application to plant and medical sciences. Topics include nanomaterial-mediated genome editing and transformation, targeted and controlled drug delivery, nanosensors for electrical signals and signaling molecules, and cyborg plants and animals with augmented or novel functions.

BPSC 150 Genes, Selection, and Populations 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 102 with a grade of "C-" or better, upper-division standing; or consent of instructor. Considers the conscious manipulation of allelic frequencies in populations as the basis for domestication of crop and animal species. Examines the genetic basis and standard strategies for the improvement of targeted characteristics in populations of plants and animals through selection and introgression of specific genes and gene constructs.

BPSC 183 Plant Biochemistry and Pharmacology of Plant Metabolites 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BCH 110A or BCH 110HA, BCH 110B or BCH 110HB; or BCH 100; or consent of instructor. Explores plant biochemistry and the significance of plant metabolites in medicine and pharmacology. Focuses on biotechnology, medicinal plants, and plant-derived drugs as well as the biochemical and pharmacological mode-of-action of secondary plant metabolites. Also addresses plant-specific biochemical processes such as photosynthesis. Cross-listed with BCH 183.

BPSC/ENTM 184 Planning For A Postgraduate Career in Life Sciences 2 Lecture, 1 hour; discussion, 1 hour. Prerequisite(s): restricted to class level standing of junior, or senior; restricted to major(s)

Biochemistry, Biology, Cell, Molecular, and Development, Entomology, Microbiology, Neuroscience, Plant Biology; or consent of instructor. Introduces life science majors to diverse career options in industry, government, and academia. Develops skills for finding and acquiring jobs. Emphasizes careers in the plant sciences, biotechnology, and related areas through presentations by professionals representing a variety of educational levels and careers.

CBNS 108 Introduction to Developmental Biology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 102, CHEM 008C and CHEM 08LC or CHEM 08HC and CHEM 08HLC; or consent of instructor. Emphasizes common principles and key concepts that govern development of multiple eukaryotic systems, and how genes control cell behavior during development.

CBNS/PSYC 121 Developmental Neuroscience 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CBNS 106 or consent of instructor. A study of the development of nervous systems. Examines the cellular and molecular mechanisms of neural development and the determinants of cell birth and death, axonal pathfinding, neuronal connections, and development of neural systems underlying behavior. Cross-listed with PSYC 121.

CBNS/ENTX 150 Cancer Biology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BCH 110C or BCH 110HC or BIOL 107A or CBNS 101 (may be taken concurrently with consent of instructor). Explores the origin, development, and treatment of cancer with emphasis on molecular mechanisms. Covers topics such as oncogenes, tumor suppressors, cell cycle and differentiation, AIDS, and hereditary and environmental factors in the development of cancer. Cross-listed with ENTX 150.

CBNS 165 Stem Cell Biology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CBNS 101 or consent of instructor. An introduction to various stem cells, their characteristics, and their niches. Explores the molecular concepts of stem cell self-renewal and tissue and organ development. Illustrates their application in therapies and explains routine methods used in stem cell biology. Reviews current governmental regulations and ethics.

CBNS 169 Human Embryology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A, BIOL 005B, BIOL 005C or consent of instructor. An in-depth study of normal human development from conception through the early postnatal period. Demonstrations use microscopic and other materials specifically adapted for the course. Some consideration is given to abnormal development.

ENSC/NEM 120 Soil Ecology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 002 or BIOL 005A, BIOL 05LA; CHEM 001C, CHEM 01LC or CHEM 01HC, CHEM 1HLC; ENSC 100; or consent of instructor. A study of soil biota and their relationships with plants and the soil environment. Emphasizes life strategies of soil organisms and methods to study them. Examines importance of microbial and faunal groups from the rhizosphere to the ecosystem. Explores impact on soil fertility, carbon and nitrogen cycles, and Earth's climate. Cross-listed with NEM 120.

ENSC 133 Environmental Microbiology 4 Lecture, 3 hours, discussion, 1 hour. Prerequisite(s):BIOL 005A, BIOL 05LA or BIOL 020, BIOL 005B, BIOL 005C; or consent of instructor. Introduction to nonpathogenic microorganisms in the environment. Topics include an introduction to microbial biology and microbial and metabolic genetic diversity; methods; symbiotic interactions; biofilms; and geomicrobiology

and biogeochemistry. Explores life in extreme environments and the effects of the physical and chemical environment on microbes. Cross-listed with MCBL 133.

ENSC/BPSC 134 Soil Conditions and Plant Growth 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 104/BPSC 104 or ENSC 100; or consent of instructor. A study of the chemical, physical, and biological properties of soils and their influence on plant growth and development. Topics include soil-plant water relations; fundamentals of plant mineral nutrition; soil nutrient pools and cycles; soil acidity, alkalinity, salinity, and sodicity; root symbioses; and rhizosphere processes. Cross-listed with BPSC 134.

ENTM 101 Evolution of Insect Genomes 4 Lecture, 3 hours; research, 3 hours. Prerequisite(s): BIOL 005C with a grade of C- or better; restricted to class level standing of sophomore, junior, or senior. Introduces the field of insect genomics and bioinformatics. Provides hands-on bioinformatic instruction of structural and functional aspects of insect genomes within an evolutionary framework. Topics include the genomic basis of key insect innovations, insect phenotypes such as pesticide resistance, and host plant specialization. Prior knowledge of coding not required.

ENTM 111 Molecular Biology and Genomics of Human Disease Vectors 3 Lecture, 2 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A with a grade of C or better, BIOL 05LA with a grade of C or better. Introduces human diseases transmitted by insects/arthropods (insect vectors) that claim about a million deaths annually and cause enormous suffering globally. Highlights adaptations that have contributed to the evolutionary success of disease vectors as well as biotechnological advances in vector control.

ENTM/BIOL/BPSC 112 Systematics 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005C or equivalent. Principles and philosophy of classification. Topics include phylogenetic and phenetic methods, species concepts, taxonomic characters, evolution, hierarchy of categories, and nomenclature. Cross-listed with BIOL 112, and ENTM 112.

ENTM/ENTX/PLPA 125 Pesticides, Biological Organisms, and the Environment 3 Lecture, 3 hours. Prerequisite(s): two of the following courses; BIOL 005A; BIOL 005B; BIOL 005C; CHEM 008A and CHEM 08LA or CHEM 08HA and CHEM 08HLA; CHEM 008B and CHEM 08LB or CHEM 08HB and CHEM 08HLB; CHEM 008C and CHEM 08LC or CHEM 08HC and CHEM 08HLC. An introduction to the chemistry, mode of action, and use of insecticides, acaricides, herbicides, and biopesticides from discovery to environmental interactions. Includes genetics of pesticide resistance development and government regulation. Cross-listed with ENTX 125, and PLPA 125.

ENTM 126 Medical and Veterinary Entomology 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): BIOL 005B, BIOL 005C; or consent of instructor. Covers biology, ecology, and management of arthropods that affect human and animal health. Considers arthropods as direct pests and vectors of notorious diseases (e.g., malaria, plague). Also addresses disease epidemiology and prevention, as well as control of pests and associated diseases.

ENTM/MCBL 139 The Evolution of Conflict and Cooperation: Cheaters and Altruists 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005C; or consent of instructor. Explores the evolution of selfish and selfless behavior. An analysis of the evolutionary forces that create either conflict or cooperation among genes, microorganisms and their hosts, and kin. Cross-listed with ENTM 139.

ENTM/BIOL 173 Insect Physiology 4 Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): BIOL 005A, BIOL 005B; CHEM 008A or CHEM 08HA; CHEM 008B or CHEM 08HB; CHEM 008C or CHEM 08HC;

CHEM 08LA or CHEM 08HLA; CHEM 08LB or CHEM 08HLB; CHEM 08LC or CHEM 08HLC; restricted to class level standing of sophomore, junior, or senior; or consent of instructor. Introduction to principles of insect physiology. Covers growth, development and hormones, cuticle, nervous system, circulation, respiration, digestion, nutrition, excretion, reproduction, water balance, and temperature relations. Prior knowledge of insects not required. Cross-listed with BIOL 173.

GNBT120 Analysis of Genomes Laboratory 4 Lecture, 1 hour; discussion, 1 hour; laboratory, 6 hours. Prerequisite(s): BIOL 005C with a grade of "C-" or better; BIOL 102 with a grade of "C-" or better; MATH 007B or MATH 009B or MATH 09HB with a grade of "C-" or better. Introduces the key computational approaches used in the analysis of genomes and their functional outputs. Topics include genome assembly and annotation, identification and analysis of genomic sequence variation, modern molecular mutant identification, quantitative trait mapping, genome-wide association mapping, mRNA and small RNA profiling, network analysis, and comparative genomics. Computer programming experience is not required.

GNBT130 Genomes: Structure and Evolution Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL102 with a grade of "C-" or better. Explores the content of genomes from microbes to plants to animals with emphasis on how they are analyzed and how they diversify and evolve.

GNBT 197 Research For Undergraduates 1 to 4 Research, 3 to 12 hours. Prerequisite(s): upper-division standing; consent of instructor. Individual research conducted under the direction of a Genetics and Biotechnology-affiliated faculty member. A written proposal must be approved by the supervising faculty member and undergraduate advisor. A written report must be filed with the supervising faculty member at the end of the quarter. Course is repeatable.

GNBT 199 Senior Research 2 to 4 Laboratory, 6 to 12 hours. Prerequisite(s): senior status; a GPA of 3.2 or better in upper-division courses in Genetics and Biotechnology; or consent of instructor. Individual research on a problem relating to GNBT program goals. A written proposal signed by the supervising faculty member must be approved by the GNBT undergraduate advisor. A written report must be filed with the supervising faculty member and submitted to the GNBT undergraduate advisor. Course is repeatable, but total credit toward graduation may not exceed 9 units.

MCBL/BIOL 121 Introductory Microbiology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A; BIOL 05LA or BIOL 020; BIOL 005B; BIOL 005C; CHEM 001C or CHEM 01HC; MATH 007B or MATH 009B or MATH 09HB; PHYS 002A, may be taken concurrently or PHYS 02HA, may be taken concurrently; PHYS 02LA, may be taken concurrently or PHYS 02HLA, may be taken concurrently; BCH 100, may be taken concurrently or BCH 110A, may be taken concurrently or BCH 110HA, may be taken concurrently; STAT 010; or consent of instructor. An intensive introduction to the fundamental physiology and molecular biology of bacteria and viruses. Covers bacterial and viral molecular genetics, an introduction to microbial pathogenesis, and applications of microbiology in modern societies. Cross-listed with MCBL 121. Credit is awarded for one of the following MCBL 121, BIOL 121, or MCBL 131.

MCBL/BIOL 121L Microbiology Laboratory 3 Lecture, 1 hour; laboratory, 6 hours. Prerequisite(s): BIOL 121 with a grade of C- or better or MCBL 121 with a grade of C- or better. Laboratory exercises in diagnostic bacteriology, basic virology, and epidemiology. Includes fundamental quantitative and diagnostic microbiological procedures, basic mechanisms of microbial genetic exchange, and a project examining

bacterial epidemiology. Cross-listed with MCBL 121L. Credit is awarded for one of the following MCBL 121L, BIOL 121L, or MCBL 131L.

MCBL/BIOL/PLPA 123 Introduction to Comparative Virology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A, BIOL 05LA or BIOL 020, BIOL 005B, BIOL 005C, CHEM 001C or CHEM 01HC, CHEM 008C and CHEM 08LC or CHEM 08HC and CHEM 08HLC, MATH 007B or MATH 009B or MATH 09HB, PHYS 002C or PHYS 02HC, PHYS 02LC or PHYS 02HLC, BCH 100 or BCH 110A or BCH 110HA, one course in statistics; or consent of instructor. Considers viruses as infectious agents of bacteria, plants, and animals (vertebrates and invertebrates). Compares the major groups of viruses to each other with respect to their biological and biochemical properties, molecular and genetic characteristics, and modes of replication. Cross-listed with BIOL 123, and PLPA 123.

MCBL/BIOL 124 Medical Microbiology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A; BIOL 05LA or BIOL 020; BIOL 005B; BIOL 005C; CHEM 008C or CHEM 08HC; CHEM 08LC or CHEM 08HLC; MATH 007B or MATH 009B or MATH 09HB; PHYS 002C or PHYS 02HC; PHYS 02LC or PHYS 02HLC; BCH 100 or BCH 110A or BCH 110HA; STAT 010; or consent of instructor. An intensive introduction to the fundamental physiology and molecular biology of bacteria and viruses. Covers research strategies for examining microbial pathogenic mechanisms. Cross-listed with BIOL 124.

MCBL 126 Microbiomes 3 Lecture, 3 hours. Prerequisite(s): BIOL 005A, BIOL 05LA or BIOL 020; BIOL 005B; BIOL 005C; CHEM 008C or CHEM 08HC; CHEM 08LC or CHEM 08HLC; MATH 007B or MATH 009B or MATH 09HB; PHYS 002C or PHYS 02HC; PHYS 02LC or PHYS 02HLC; BCH 100 or BCH 110A or BCH 110HA; STAT 010; or consent of instructor. Introduces microbiomes, which are the collections of microorganisms that inhabit particular environments or locations and play crucial roles in agriculture, the environment, and human health and disease. Covers fundamental knowledge about microbiomes and experimental strategies to understand and utilize microbiomes to prevent or treat human and plant diseases. Credit is awarded for one of the following MCBL 126 or MCBL 226.

MCBL 127 Microbial Evolution 4 Lecture 3 hours; workshop, 1 hour. Prerequisite(s): BIOL 005A, BIOL 05LA or BIOL 020; BIOL 005B; BIOL 005C; CHEM 008C or CHEM 08HC; CHEM 08LC or CHEM 08HLC; MATH 007B or MATH 009B or MATH 09HB; PHYS 002C or PHYS 02HC; PHYS 02LC or PHYS 02HLC; BCH 100 or BCH 110A or BCH 110HA; STAT 010; or consent of instructor. Explores essential roles microbes perform in biogeochemical cycles, directly influencing human, plant, and animal health and disease. Provides important platforms for research and biotechnology. Details the evolutionary history and processes that underlie the critical roles of microbes. Credit is awarded for one of the following MCBL 127 or MCBL 227.

MCBL 129 Host Responses to Viral Pathogens 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 005A; BIOL 05LA or BIOL 020; BIOL 005B; BIOL 005C; CHEM 008C or CHEM 08HC; CHEM 08LC or CHEM 08HLC; MATH 007B or MATH 009B or MATH 09HB; PHYS 002C or PHYS 02HC; PHYS 02LC or PHYS 02HLC; BCH 100, may be taken concurrently or BCH 110A, may be taken concurrently or BCH 110HA, may be taken concurrently; or consent of instructor. Explores host responses to viral infections. Presents content that will promote understanding of how viruses interact with innate immune responses of the mammalian host and how these responses impact disease outcomes for better or worse. Credit is awarded for one of the following MCBL 129 or MCBL 229.

MCBL/ENSC 133 Environmental Microbiology 4 Lecture, 3 hours, discussion, 1 hour. Prereq- uisite(s): BIOL 005A, BIOL 05LA or BIOL 020, BIOL 005B, BIOL 005C; or consent of instructor. Introduction to nonpathogenic microorganisms in the environment. Topics include an introduction to microbial biology and

microbial and metabolic genetic diversity; methods; symbiotic interactions; biofilms; and geomicrobiology and biogeochemistry. Explores life in extreme environments and the effects of the physical and chemical environment on microbes. Cross-listed with ENSC 133.

NEM/BIOL 159 Biology of Nematodes 3 Lecture, 2 hours; discussion and demonstration, 1 hour. Prerequisite(s): BIOL 005A, BIOL 05LA or BIOL 020, BIOL 005B, BIOL 005C, CHEM 001C or CHEM 01HC, CHEM 008C and CHEM 08LC or CHEM 08HC and CHEM 08HLC, MATH 007B or MATH 009B or MATH 09HB, PHYS 002C or PHYS 02HC, PHYS 02LC or PHYS 02HLC, BCH 100 or BCH 110A or BCH 110HA, one course in statistics. An introduction to the biology of nematodes. Topics include the morphology, physiology, development, genetics, behavior, and ecology of nematodes from parasitic and free-living habitats. In the discussion and demonstration section, students observe the comparative morphology and biology of nematodes and give oral presentations on selected nematode life histories. Cross-listed with BIOL 159.

PLPA/BIOL/MCBL 120 Introduction to Plant Pathology 3 Lecture, 3 hours. Prerequisite(s): BIOL 005A, BIOL 05LA or BIOL 020, BIOL 005B, BIOL 005C, CHEM 001C or CHEM 01HC, CHEM 008C and CHEM 08LC, or CHEM 08HC and CHEM 08HLC, MATH 007B or MATH 009B or MATH 09HB, PHYS 002C or PHYS 02HC, PHYS 02LC or PHYS 02HLC, BCH 100 or BCH 110A or BCH 110HA, one course in statistics; or consent of instructor. An introduction to the study of plant diseases. Topics include diseases and disease-causing agents, host-pathogen interaction during disease development, and strategies for disease management. An optional, separate laboratory is offered. Cross-listed with BIOL 120 and MCBL 120. Credit is not awarded for PLPA 210 if it has already been awarded for BIOL 120/MCBL 120/PLPA 120 and/or BIOL 120L/ MCBL 120L/ PLPA120L.

PLPA/BIOL/MCBL 120L Introduction to Plant Pathology Laboratory 1 Laboratory, 4 hours. Prerequisite(s): BIOL 005A, BIOL 05LA or BIOL 020; BIOL 005B; BIOL 005C; CHEM 008C or CHEM 08HC; CHEM 08LC or CHEM 08HLC; MATH 007B or MATH 009B or MATH 09HB; PHYS 002C or PHYS 02HC; PHYS 02LC or PHYS 02HLC; BCH 100 or BCH 110A or BCH 110HA; MCBL 120, may be taken concurrently or BIOL 120, may be taken concurrently or PLPA 120, may be taken concurrently; STAT 010, may be taken concur- rently; BIOL 121/MCBL 121 and BIOL 124/MCBL 124 recommended; or consent of instructor. Covers fundamentals in the use of laboratory instruments and techniques for the detection, isolation, and identification of representative infectious agents that cause disease in plants. Cross-listed with BIOL 120L, and MCBL 120L. Credit is awarded for one of the following PLPA 120L, BIOL 120L, MCBL 120L, or PLPA 210.

PSYC 178 Health Psychology 4 Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): PSYC 002 or SOC 001 or SOC 001H. An examination of the importance of interpersonal relationships to physical health and effective medical care. Applies social psychological perspectives to such topics as stress-related diseases, placebo effects, doctor-patient interactions, dying, and the hospital environment.

APPENDIX III. LETTERS OF SUPPORT (2023-24)

Department of Biochemistry
University of California
900 University Avenue
Riverside, CA 92521-0001

Dr. Xuan Liu
Tel: (951) 827-4350
Email: xuan.liu@ucr.edu

January 30, 2024

Dr. David Nelson
Department of Botany and Plant Sciences
University of California
Riverside, CA 92521

Dear Dr. Nelson,

The Department of Biochemistry supports your proposal for a new B.S. major in Genetics and Biotechnology. We are happy to participate in any way possible. In particular, we will comtribute to the new major by allowing undergraduates in the major to take all Biochemistry courses (BCH100, BCH110A, BCH110HA, BCH 110B, BCH 110HB, BCH110C, BCH185 and BCH188) you have listed in your proposal.

Please do not hesitate to contact me if you have any questions or concerns about our level of support.

Sincerely,

Xuan Liu
Professor
Department of Biochemistry
University of California
Riverside, CA 92521

UC RIVERSIDE UNIVERSITY OF CALIFORNIA

Department of Entomology – 041
College of Natural and Agricultural Sciences

January 9, 2024

Dr. David Nelson
Department of Botany and Plant Sciences
University of California
Riverside, CA 92521

Dear Dr. Nelson,

The Department of Entomology strongly supports your proposal for a new B.S. major in Genetics and Biotechnology. **It is long overdue**. We are happy to participate in any way possible. In addition to the Entomology courses you have listed as contributing to this major, I suggest that you add the following courses as well: ENTM/BPSC/BIOL 112 (*Systematics*-suitable for any of the tracks), ENTM 130 (*Invasion Ecology*-suitable for Biotechnology track), and ENTM 139 (*Evolution of Conflict and Cooperation; Cheaters and Altruists*-suitable for Genetics and Genomics track). These latter courses all have a considerable component of genetics/genomics and/or applied biotechnology. Please do not hesitate to contact me if you have any questions or concerns about our level of support.

Sincerely,

Rick Redak, Chair

DEPARTMENT OF MOLECULAR, CELL
AND SYSTEMS BIOLOGY
RIVERSIDE, CALIFORNIA 92521 USA
VOICE: (951) 827-5903
FAX: (951) 827-4286

DATE: January 18, 2024

TO: David Nelson
Department of Botany and Plant Sciences

FROM: Morris Maduro, Chair
Department of Molecular, Cell and Systems Biology

RE: Proposed Genetics and Biotechnology (GNBT) Major

Dear David,

Thank you for meeting with the MCSB department at its faculty meeting of January 8, 2024, to clarify questions about the proposed GNBT major. The faculty are in support of the major, which they see as relevant and likely to appeal to students looking for careers in emerging genetics and biotechnology fields, including Genetic Counseling. Some suggestions were made as follows:

1. The proposed new courses are likely to have significant overlap with existing courses. For example, BIOL 107B and BIOL 115 both have medical genetics topics. As the new GNBT courses are proposed, it would be good to get detailed syllabi of any similar courses to be able to identify such overlaps.
2. The department was concerned about staffing to offer the new GNBT courses. Several majors including CMDB are experiencing issues with several upper-division courses (e.g. CBNS 169, Human Embryology) due to retirements. Finding a way to engage Chairs of other life science departments, and strategic hiring of new faculty (possibly Professors of Teaching as well) will both be important.
3. Additional courses in the life sciences could be included as electives and required courses. This will be helpful for students to complete degree requirements. For example, BIOL 107B could be made a requirement for the Medical Genetics Track because of its coverage of medically relevant genetics topics, and CBNS 101 (Cell Biology) could be added as an elective to the General and Biotechnology tracks.
4. Several of the lower-division courses, while part of the common courses taken by all life sciences majors, add a lot of units that will prevent students from taking many of the major-specific courses. At some point a detailed consideration of the lower-division requirements should be made to see if some could be cut, for example BIOL 005C, or PHYS 002C. We recognize that this is currently a controversial issue across many of the life sciences majors.

Subject: Re: request for letter of support for new Genetics and Biotechnology major
Date: Tuesday, January 30, 2024 at 3:27:59 PM Pacific Standard Time
From: David C Nelson on behalf of David C Nelson
To: Joel Sachs, eeobchair, Kurt Anderson

Dear Joel,

Thank you for this letter.

Regarding the points that were raised:

1. We agree and have created a four-year sequence example. We will add these to the proposal package and putatively the catalog (per the examples set by CMDB).
2. We weren't clear on how the transfer student section should be expanded, and we had followed the example of Plant Biology. Per usual practice, advisors will be able to substitute equivalent courses taken at other institutions.
3. We agree with the significance of evolutionary biology to genetics. We have added BIOL 105 as an elective in the Genetics and Genomics track. Other elective courses that discuss evolution are GNBT 130 (now renamed Genomes: Structure and Evolution), MCBL 139 (Evolution of Conflict and Cooperation), ENTM 101 (Evolution of Insect Genomes), BPSC 150 (Genes, Selection, and Populations), BIOL 108 (Population Genetics and Genomics), and BIOL 118 (Methods in Molecular Ecology and Evolution). BIOL 106 (Biology of Human Variation) would be a good addition, too, if it is revived. (The registrar said it has not been taught in 10 years.)

If this satisfies the concerns of EEOB sufficiently, we would greatly appreciate your support for the proposal.

Best regards,

Dave

From: Joel Sachs <joels@ucr.edu>
Date: Tuesday, January 2, 2024 at 2:48 PM
To: dave <david.nelson@ucr.edu>, eeobchair <eeobchair@ucr.edu>, Kurt Anderson <kurta@ucr.edu>
Subject: Re: request for letter of support for new Genetics and Biotechnology major

Dear David,

I write this letter in response to your proposal for a Bachelor of Science Degree Program in Genetics and Biotechnology (GNBT).

I read over your proposal, and I also forwarded it to the faculty of the EEOB Department. The faculty that responded about the proposal were generally supportive and described the plan as well organized and rigorous. I agree with this sentiment and am supportive of the proposal.

A couple of important suggestions were made.

1. The plan could benefit from a sample four-year sequence of courses (the sort that the

staff advisors have for all of the current majors). This plan could be useful to demonstrate what a typical student would need to do to graduate in four (assuming a normal math placement, etc.).

2. The statement about transfer students in section 4 (pg 3) should be expanded, as it might not be suitable to prepare transfer students to graduate on time. The current plan requires a lot of specific courses, and this might make it very challenging to attract transfer students.
3. The major should encourage students to have some training in evolutionary biology. We are concerned that Biol 105 (Evolution) was not even included in the allowable upper-level electives. Evolution is a critical and central model of genetics and students should not get such a degree without some basic training in this field.

Sincerely,

Joel

On Wed, Dec 13, 2023 at 4:17 PM David C Nelson <david.nelson@ucr.edu> wrote:

> Dear Joel,
>
> The Botany and Plant Sciences faculty recently voted to approve the attached proposal for a new B.S. major in Genetics and Biotechnology. This proposal includes the creation of six new courses (four lectures and two laboratories) and two independent research electives.
>
> At this time, we are seeking letters of support from the chairs of UCR departments that teach courses that are listed as requirements or electives for the major, are potentially impacted by the major, or can speak to the appropriateness and utility of adding this major to UCR's current offerings.
>
> If you are willing to do so, we would greatly appreciate a letter of support from you to include with the proposal during the Senate review process. We also invite feedback if there are any courses that we have missed that you feel would be appropriate additions to the list of electives. Finally, we would be grateful if you could inform us of any faculty in your department who express interest in participating in the new program. Although this proposal was initiated within the BPSC department, it is not intended to be exclusive to BPSC. Genetics is a discipline used by many faculty across campus; we hope to form a robust, diverse team of faculty from different departments who are interested in launching and growing this program.
>
> Thank you in advance for your time and consideration of this request. If you have any questions, please don't hesitate to let me know.
>
> Best regards,
>
> Dave

David Nelson
Professor of Genetics
Department of Botany & Plant Sciences
University of California
Riverside, CA 92521
http://nelsonlab.ucr.edu/
(951) 827-4397

--

Joel L. Sachs
Professor & Chair, Evolution Ecology & Organismal Biology
University of California, Riverside
Chair's Office 2745 Life Sciences Building
Office (951) 827-6357 / Fax (951) 827-4286 / http://www.sachslab.com
Zoom: http://ucr.zoom.us/my/Sachsevolution

Post address: Sachs Lab - UC Riverside
3401 Watkins Dr., 1229 Spieth Hall, Riverside, CA 92521

Subject: Re: request for letter of support for new Genetics and Biotechnology major
Date: Monday, December 18, 2023 at 11:36:21 AM Pacific Standard Time
From: Tuppett Yates
To: David C Nelson

Hi Dr. Nelson,
If you would draft a letter of support, I'd be happy to sign off with the following caveat: We have not taught 179 in many years and when it was last taught, it was done using the 178 syllabus, which created havoc. Thus, I would NOT include 179 in your proposal. When the course was last taught (more than 3 years ago), there was discussion of either removing it from the books or doing a major overhaul to reduce overlap with 178. At present, the course is in a gray zone with no plans for offering it in the next few years. 178 is taught twice annually (and also in summers). Although it has been taught by associate instructors for many years, we have a new faculty member who is planning to pick it up. Either way, 178 will be offered consistently moving forward and can be included in your proposal.
I hope this information is helpful.
Best,
Tuppett

Tuppett M. Yates, PhD (she/her)

Professor & Chair, ***UCR Department of Psychology***

Director, ***Adversity & Adaptation Lab***

Executive Director, ***Guardian Scholars & Foster Youth Support Services***

Department of Psychology| Riverside, CA 92521 | Phone: 951-827-4991

On Wed, Dec 13, 2023 at 4:39 PM David C Nelson <david.nelson@ucr.edu> wrote:

> Dear Dr. Yates,
>
> The Botany and Plant Sciences faculty recently voted to approve the attached proposal for a new B.S. major in Genetics and Biotechnology. This proposal includes the creation of six new courses (four lectures and two laboratories) and two independent research electives.
>
> At this time, we are seeking letters of support from the chairs of UCR departments that teach courses that are listed as requirements or electives for the major, would be potentially impacted by the major, or who can speak to the appropriateness and utility of adding this major to UCR's current offerings. We have listed PSYC 178 and PSYC 179 as requirements for the Medical Genetics/Pre-genetic Counseling track of the proposed major. (We did not list the prerequisite course PSYC 002 as a lower-division requirement because it does not apply to all tracks, but we plan to manage this issue during undergraduate advising.)
>
> If you are willing to do so, we would greatly appreciate a letter of support from you approving the use of these courses, which we would include with the proposal during the Senate review process.

Thank you in advance for your time and consideration of this request. If you have any questions, please don't hesitate to let me know.

Best regards,

Dave

David Nelson

Professor of Genetics

Department of Botany & Plant Sciences

University of California

Riverside, CA 92521

http://nelsonlab.ucr.edu/

(951) 827-4397

UNIVERSITY OF GEORGIA

Fred C. Davison Life Sciences Complex
120 E. Green Street
Athens, Georgia 30602-7223
TEL 706-542-8000 | FAX 706-542-3910
www.genetics.uga.edu

Franklin College of Arts and Sciences
Department of Genetics

December 14, 2023

Dear Dr. Nelson,

I strongly support the proposed plan for a new B.S. major in Genetics and Biotechnology at the University of California, Riverside. The ability to rapidly sequence DNA and interpret the impact of changes to DNA sequences is positively impacting fields from health to agriculture. There is a growing need from employers for students that understand genetics concepts and genomes from diverse organisms. I have reviewed the proposal to create six new courses (four lectures and two laboratories) and two independent research electives, in addition to integrating relevant courses scattered across different departments at UCR. As the Director of Graduate Studies at the University of Georgia, students who complete this major would be highly qualified to enter our graduate program and hit the ground running. They would also be well prepared for jobs in biotechnology and medicine. I'm excited to see the development of this major, as it will serve your student population well to make them competitive for future careers.

Sincerely,

Dr. Robert J Schmitz
Director of Graduate Studies
UGA Foundation Professorship in the Plant Sciences
Georgia Research Alliance Lars G Ljungdahl Distinguished Investigator
Professor
Department of Genetics

UNIVERSITY OF CALIFORNIA, BERKELEY

BERKELEY • DAVIS • IRVINE • LOS ANGELES • MERCED • RIVERSIDE • SAN DIEGO • SAN FRANCISCO SANTA BARBARA • SANTA CRUZ

SHENG LUAN
CHANCELLOR'S PROFESSOR AND CHAIR
DEPARTMENT OF PLANT & MICROBIAL BIOLOGY
BERKELEY, CALIFORNIA 94720-3102
111 KOSHLAND HALL #3102
OFFICE: 510-642-6306
EMAIL: SLUAN@BERKELEY.EDU

December 15th, 2023

To whom this may concern,

I heard that UC Riverside plans to implement a new undergraduate major in Genetics and Biotechnology. This is indeed a very timely and exciting educational initiative to train students in an increasingly important and broad area in biomedicine and agriculture. The proposed courses include 4 core lectures and two labs plus other electives across several departments are logical and will integrate strengths in various units across campus. The student trained in this major should be in high demand by the employers in biomedical and agricultural sectors in industry as well as in government units and research enterprises. In particular, the students from this major will be well prepared for graduate studies in genetic and biotech departments at universities across the country. I can see how my department (with a PhD program in genetics and plant biology) will be interested in recruiting students from such a major at UCR. I thus strongly support establishing this major and believe that the students in the major will be well trained and ready for multiple career choices in the future.

Sincerely,

Sheng Luan

KGI OFFICE OF THE PRESIDENT

535 Watson Drive, Claremont, CA 91711
kgi.edu

January 5, 2024

Dr. David Nelson, Professor of Genetics
University of California
Department of Botany & Plant Sciences
Riverside, CA 92521

Re: Support for the proposed Bachelor of Science Degree Program in Genetics and Biotechnology (GNBT) at UCR

Dear Dr. Nelson,

I am writing to support your effort to initiate a new undergraduate Bachelor of Science degree program in Genetics and Biotechnology (GNBT) at the University of California, Riverside. I have reviewed your proposed program courses and requirements and find it an outstanding opportunity to offer your students an exciting new career path. I am impressed with the program's design, and if I might, please allow me to provide some background on the sources of my enthusiasm.

First, the program provides a wide range of breadth, underpinned by a requirement for appropriate scientific depth. This combination will ensure an abundance of career options for students who will pursue the GNBT at UCR. In my current role, I interact very often with biotechnology companies where the discussion invariably turns to the supply of staff – at all levels – who come with an understanding of the science underpinning biotechnology and the role that the life sciences will play in the future of health care, environmental remediation and the sustainable production of food. Your proposed program appears to be rigorous, with abundant science content and offers a wide range of courses in all areas of the life sciences to accommodate students' interests. This combination will be an excellent foundation for building a career or pursuing further education. Incidentally, the models now being developed for executive education are often made available during full-time employment. Graduates of your proposed program would be ideally prepared to take advantage of such opportunities for immediate career development and lifelong learning and advancement.

In addition, the range of offerings you will provide will enable graduates to be involved in – and learn about – careers where they can use their skills and abilities optimally. The employment opportunities in regulatory affairs, for example, are essentially invisible to most undergraduate STEM majors, even though the needs in the biotechnology industry far outstrip the supply. Similarly, your students can go to careers, either directly or with limited further study, in advanced biomanufacturing, clinical trial management, or the biotechnology business. These areas provide excellent career opportunities that are largely unknown among undergraduates, and of equal importance, they are employment that often does not require relocation from Southern California. I know your students will appreciate all these benefits of the program!

Finally, as you know, we at KGI have a graduate program in Genetic Counseling and one Genome Data Analytics. Both of these programs have grown substantially in the last few years, driven by the demand in the life sciences industry as well as by increased recognition of the value of precision medicine. Unfortunately, few students in genetics undergraduate programs realize that there are even careers that utilize genetics. As genomic data becomes more available, the needs and opportunities for analyzing and utilizing the information produced will be necessary to advance health care and provide crops that will feed our climate-challenged planet. Your program, as proposed, will bridge the background-to-awareness gap necessary to fill industry needs, but more importantly, it will open new career paths for your students.

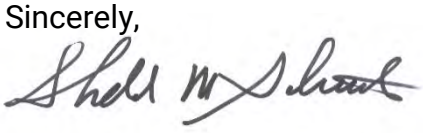
As you can tell, I am enthusiastic about your proposed GNBT degree program. I am hopeful that we can work with you and your students as you begin. For example, we would be excited to offer your students opportunities to join our students in activities where they can learn about careers, be mentored by advanced graduate students, or get together to develop a network of beginning professionals. Our Genetic Counseling program has activities that could involve your students, and possible projects are available with our Genome Data Analytics program. Our Bioscience Business program would be excited to have some of your students participate in our industry-sponsored Team Masters Projects. We could also get UCR students involved in the nation's first student chapter of the National Organization for Rare Disorders (NORD).

I hope you are successful in launching this new program as soon as possible. It is well-designed, contains rigorous science, and provides ample opportunities for students to follow areas of interest. Furthermore, it will enable your graduates to pursue rewarding careers and develop a solid foundation for life-long career growth. I am hopeful we can work together to provide opportunities and enrichment for your students.

If you need any further information, please feel free to contact me anytime.

Best of luck with this innovative new program!

Sincerely,



Sheldon M. Schuster, President

Institutional Research, 900 University Avenue, 3108 Hinderaker Hall, Riverside, CA 92521

TO: **David Nelson, Professor, Botany & Plant Sciences**

FROM: **Scott Heil, Assistant Vice Chancellor for Institutional Research**

RE: **Enrollment Data Review for the Genetics & Biotechnology B.S. Program**

The UCR Institutional Research office has completed a review of available academic data related to the proposed Genetics & Biotechnology B.S. degree program. Please see the summary of our observations below.

1. Recent Trends in Related Programs at UCR

UCR has enjoyed extremely high demand for its undergraduate biological sciences programs. In recent years the Biology (BIOL) and Cellular, Molecular & Developmental Biology (CMDB) majors combined have received more admission applications and have admitted more applicants than any other single program at UCR. From fall 2014 to fall 2023, the enrolled headcount of students in those programs grew by more than 50 percent, from 1,945 to 3,020 undergraduates. Total admission applications (combined first-year and transfer) for those two programs increased by nearly 90 percent during the same period. It should be noted that BIOL and related life sciences programs at UCR also have favorable student outcomes, with retention and graduation rates higher than the campus average.

UCR has not had a large new related program in many years, so representative internal examples of new program growth are limited. Figure 1 (attached) shows select application and admission trends for three new undergraduate programs that were first offered within the past eight years: Computer Science with Business Applications (CSBA), Data Science-BCOE (DTSE), and Data Science-CNAS (DTSC).

While none of these are closely related to the subject matter of the Genetics & Biotechnology program, there are perhaps a few parallels with the creation of the CSBA program. UCR already had a large, thriving Computer Science program at the time the CSBA major was launched, and similar to Biology, it already received some of the most admission applications of any UCR undergraduate program. As Figure 1 shows, CSBA began with 290 applications in fall 2017 and initially 13 enrolled first-year undergraduates. Within four years CSBA had reached more than 200 total enrolled students. However, there had already been a small similar Business Informatics (BUNF) program that was being discontinued around the same time, and a number of students who had either applied to or started in that program eventually migrated into CSBA, so in that sense the program did

not start completely from scratch. Meanwhile, the combined enrollment in the two Data Science majors also surpassed enrollment of 200 as of their fourth year being offered.

Based on these admittedly imperfect comparisons, combined with the very large applicant pool for Biology, the proposed enrollment levels for the first several years of the Genetics & Biotechnology B.S. seem quite reasonable.

2. Evidence from Other Public R1 Universities

Comprehensive enrollment data is not available publicly for all universities at the detailed program level. As a proxy, the IR office reviewed a non-representative sample of 11 public R1 universities that have posted their program-level enrollment statistics to a private nonprofit database.[1] For undergraduate programs in either Biotechnology (CIP 26.12) or Genetics (CIP 26.08) we observed the following for the fall 2022 across the sample of 11 universities[2]:

- The average undergraduate program had approximately 80 enrolled students, but with high variability between institutions. The smallest program had a headcount of 16 and the largest had 191, with a median of 42. (Note: One institution reported enrollment under two different genetics CIP codes and for this purpose we added them together and treated them as one program for comparison.)

- Three of the four institutions with enrollment greater than 100 undergraduates in these programs were larger institutions with total undergraduate headcount above 35,000.

- Over the past decade, there was no consistent growth trend in the genetics/biotechnology undergraduate enrollment within each institution. Several of the larger programs reached their peak enrollment before 2019 and have had somewhat declining enrollments in the past three or four years. It should be noted that this does not necessarily mean decreased student interest.

These examples do not consider the focus or specializations of each institution's offerings and it is possible that some of them have emphases substantially different from the proposed program at UCR. However, these examples from other public research institutions suggest that UCR's Genetics & Biotechnology B.S. program would become one of the larger ones among peer institutions. It may

[1] The Association of American Universities Data Exchange (AAUDE), 2024. Participation in this data system is voluntary and the results may not match those of other published sources. The IR office searched for additional comparison data in another self-reported peer database in which UCR participates, but we found no matching programs submitted in the past two years.

[2] Total undergraduate enrollment at the 11 institutions ranged between 18,000 and 60,000 students.

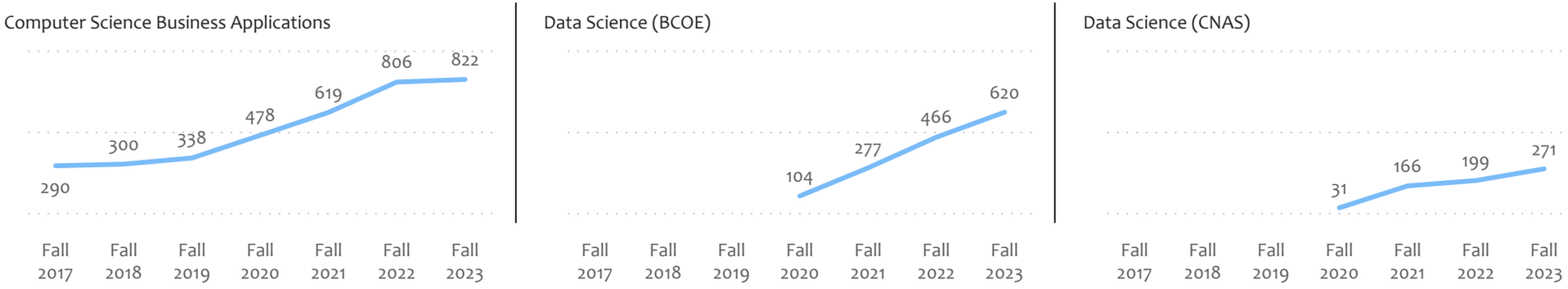
also suggest that there could be upper limits on the size of such programs, whether due to student demand or other constraints, but there is no direct evidence on that from the data we observed.

3. Conclusions

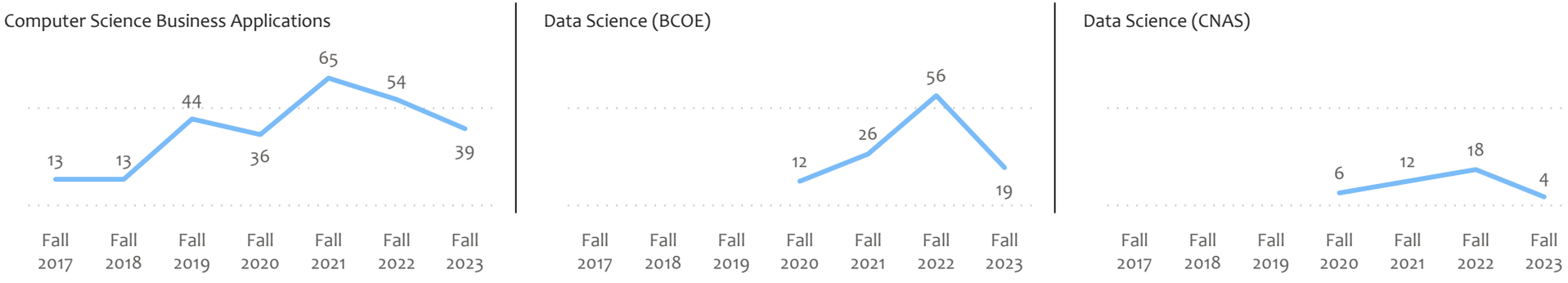
Our analysis suggests good support overall from the data for the enrollment strategy of the proposed Genetics & Biotechnology degree program. It seems likely that, over time, there will be enough undergraduate applications to reach the proposed enrollment numbers, potentially easing the current overload in the Biology major. Despite our efforts, we were unable to find comparable programs at other public R1 universities of similar size, possibly due to limitations in our data sources. Depending on how the application numbers are looking in the early years of this program, you may wish to consider additional strategies to build the program's enrollment. These include offering admission to students who applied for related majors like Biology but were not accepted, and facilitating major changes for students from other life sciences disciplines who may have an interest in this field.

Figure 1. Selected Examples of Recent New Engineering and Science Majors at UCR

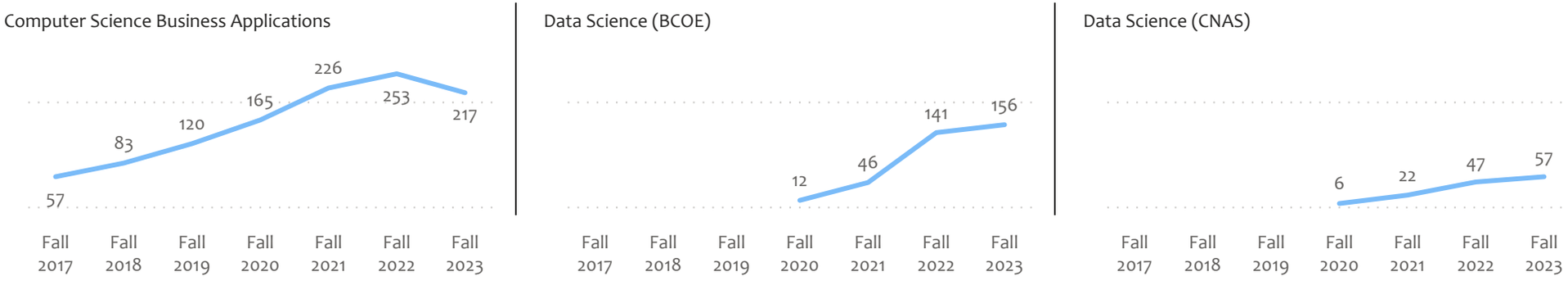
First-Year Applications



First-Year Enrollment



Total Enrollment



APPENDIX IV. INITIAL SENATE REVIEW (2024)

UC RIVERSIDE

Academic Senate

EXECUTIVE COUNCIL
Sang-Hee Lee, Chair

May 8, 2024

To: Bahram Mobasher, Chair, CNAS Faculty Executive Committee

From: Sang-Hee Lee, Chair, Academic Senate

Re: Proposed Bachelor of Science Degree Program in Genetics and Biotechnology (B.S. in Genetics and Biotechnology [GNBT])

Dear Bahram,

On April 22, 2024 Executive Council discussed the subject proposal as part of the agenda and had no comments to add to those attached from the Committee on Courses, Committee on Educational Policy and the CHASS, BCOE, SOM, and SPP Faculty Executive Committees. I provide this and the attached in consideration of a revised proposal.

Should a revision be drafted, please send it forth to my attention with a cc to Executive Director Cherysa Cortez.

Yours,

Sang-Hee Lee
Chair, Academic Senate

Cc: Director Cortez
FEC Liaison Lizardi

Attachment

UC RIVERSIDE | School of Medicine

April 15, 2024

TO: Sang-Hee Lee, Ph.D., Chair, Academic Senate, UCR Division

FROM: Marcus Kaul, Ph.D., Chair, Faculty Executive Committee, UCR School of Medicine

SUBJECT: Campus Review - Bachelor of Science Degree Program in Genetics and Biotechnology (B.S. in Genetics and Biotechnology [GNBT])

Dear Sang-Hee,

The Committee reviewed the proposal for Bachelor of Science Degree Program in Genetics and Biotechnology (B.S. in Genetics and Biotechnology [GNBT]).

The Committee discussed the proposal of a BS degree meant to give undergrads an up-to-date education in the growing genetics/biotech industry. It combines areas into one degree program, instead of courses being scattered across different disciplines.

The Committee noted that the program overall seems timely given the growing importance of biotechnology in general. While some parts of the proposal appear to link the program to health sciences and thus could give the impression of being a link to premed requirements it seems tailored more for the biotech and genetics industry. The Committee is unclear if this major is indeed intended to also satisfy premed requirements and has some concern that it may give students the misconception that it is a premed-type program.

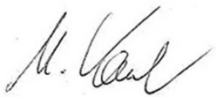
The Committee pointed out there is a sentence in the proposal about “healthcare-related grad programs” which implies that it completes premed requirements. The proposal calls this program a “health-care track”, but the Committee is conflicted with that label as they noted this program may be more appropriately labeled as “healthcare industry/biotech” not to be confused with a health/premed program.

The Committee found it troubling that the program only has a couple of healthcare upper-level requirements and seems a bit like misleading advertising. As the faculty of SOM, they agree that there must be thoughtful consideration about campus advertising health degrees when undergrads could think the program is linked to the SOM when in fact it is not. The healthcare track does not have many healthcare courses, it is only an A and B option with courses that do not seem of core relevance to healthcare. There should be education for healthcare in the upper divisions and most healthcare subjects are electives and the Committee thinks they should be requirements.

The Committee would like to know how this program ties to healthcare. There is a gap between what is offered as courses and what they claim for the program is. The Committee would like to know how the proposal defines healthcare and if it could include more healthcare courses as requirements, not electives.

The Committee would like to see the subject materials and how they define the content of healthcare courses in the degree program.

Yours sincerely,



Marcus Kaul, PhD
Chair, Faculty Executive Committee School of Medicine

School of Public Policy
University of California, Riverside
INTS 4133 | 900 University Ave
Riverside, CA 92521

TO: Sang-Hee Lee, Chair
Riverside Division

FR: Richard M. Carpiano, Chair
Executive Committee, School of Public Policy

RE: [Campus Review] Proposal: Bachelor of Science Degree Program in Genetics and Biotechnology (B.S. in Genetics and Biotechnology [GNBT])

Date: April 22, 2024

The Faculty Executive Committee of the School of Public Policy reviewed the document "[Campus Review] Proposal: Bachelor of Science Degree Program in Genetics and Biotechnology (B.S. in Genetics and Biotechnology [GNBT])."

Our Committee had the following comments to report:

- In the "Genetics in Healthcare Track" section b, it is unclear:
  a. why there is only one class to select (PSYC 178 "Health Psychology"), unlike the other components that offer students a choice in which courses to select to fulfill the area
  b. what the goal of this lone course is with respect to the track's curriculum. It appears haphazardly placed.
  c. why only this course fulfills that requirement and not also other relevant social and behavioral science courses in CHASS, SPP, or elsewhere that focus on social, cultural, and even political dimensions of health, disease, health care, science, and medicine and thus complement the track's genetic focus as part of the range of contributors to health and disease.

Sincerely,

Richard M. Carpiano, Ph.D., M.P.H.
Professor of Public Policy

UC RIVERSIDE

College of Humanities, Arts, and Social Sciences
EXECUTIVE COMMITTEE

April 16, 2024

TO: Sang-Hee Lee, Chair
Riverside Division of the Academic Senate

FROM: Wesley Leonard, Chair
CHASS Executive Committee

RE: Proposal: Bachelor of Science Degree Program in Genetics and Biotechnology (B.S. in Genetics and Biotechnology [GNBT])

The CHASS Executive Committee reviewed the new Bachelor of Science Degree Program in Genetics and Biotechnology (B.S. in Genetics and Biotechnology [GNBT]). The committee is supportive of the new degree program and has no specific concerns about it moving forward but suggests considering different ways to intersect with CHASS disciplines that may bring additional value to the new major. This could provide opportunities for fruitful collaboration with CHASS units that may contribute to the enrichment in areas that the proposal could benefit – for example, in relation to ethical and related social issues, from the point of view of fields such as Native American Studies, regarding how genetic data are used.

UC RIVERSIDE Academic Senate

COMMITTEE ON EDUCATIONAL POLICY

April 8, 2024

To: Sang-Hee Lee, Chair
Riverside Division

From: Ward Beyermann, Chair
Committee on Educational Policy

Re: Proposed B.S. in Genetics and Biotechnology

The Committee on Educational Policy (CEP) reviewed the proposed B.S. in Genetics and Biotechnology at their April 5, 2024 meeting and voted to approve the proposal.

UC RIVERSIDE Academic Senate

COMMITTEE ON COURSES

April 3, 2024

To: Sang-Hee Lee, Chair
Riverside Division

From: James Flegal, Chair
Committee on Courses

Re: Proposed B.S. in Genetics and Biotechnology

The Committee on Courses reviewed the proposed B.S. in Genetics and Biotechnology at their April 3, 2024 meeting and had no concerns related to their charge of courses and instruction.

UC RIVERSIDE
Marlan and Rosemary Bourns College of Engineering

April 25, 2024

TO: Sang-Hee Lee, Chair
Riverside Division of the Academic Senate

FROM: Victor G. J. Rodgers, Chair
BCOE Executive Committee

RE: BS in Genetics and Biotechnology

On April 25, 2024, the BCOE Executive Committee reviewed the proposed BS in Genetics and Biotechnology program. The overall sentiment is that program has merit with respect to providing a focus on genetics at the BS level. However, the committee had significant concerns with 'biotechnology' in the title of the program. Providing a program that fulfills student preparation for biotechnology careers was one of the key justifications for starting the Department of Bioengineering in 2006. As stated in the UCR Catalog 2023-24, for the bioengineering major, "The major in Bioengineering allows students to complete a B.S. degree that provides a basic education to enter the fields of bioengineering and biotechnology". In addition, several other programs in BCOE provide training for biotechnology careers. Another concern is that the title may be misleading to students who choose a biotechnology career. Overall, the committee respectfully ask that, prior to moving forward, the proposal be vetted with the departments of Bioengineering, Chemical and Environmental Engineering and Computer Science so that any overlap and ambiguities can be minimized.

APPENDIX V. COMMENTS FROM BCOE DEPARTMENTS (2024)

Bourns College of Engineering
Department of Computer Science & Engineering
900 University Avenue
Riverside, CA 92521

October 16, 2024

David Nelson
Professor of Genetics
Department of Botony & Plant Sciences

Dear Professor Nelson:

Thank you for forwarding your Proposal for a Bechelor of Science Degree in Genetics and Biotechnology dated January 30, 2024. The Department of Computer Science & Engineering has reviewed the proposal and has no concerns about overlap with our existing or planned majors.

Sincerely,

Christian Shelton
Professor & Department Chair
Computer Science & Engineering

R'Mail powered by Google

David Nelson <davidn@ucr.edu>

proposed Genetics and Biotechnology major

David Cocker <dcocker@engr.ucr.edu> Tue, Mar 25, 2025 at 8:48 AM
To: David Nelson <david.nelson@ucr.edu>
Cc: "david.cocker@ucr.edu" <david.cocker@ucr.edu>

Dear Dr. Nelson,

On behalf of the Department of Chemical and Environmental Engineering, I am pleased to express our strong support for the proposed undergraduate major in Genetics and Biotechnology. The GBNT program complements CEE's MS program in Industrial Biotechnology and will help create a new pipeline of students for this degree program. The foundational training in genetics, molecular biology, and applied biotechnology will prepare students well for advanced study in bioprocessing, metabolic engineering, and related fields. This alignment will strengthen our graduate recruitment and enhance the quality of applicants. The major also fills an important gap in UCR's offerings by providing specialized coursework in genetic engineering, synthetic biology, and bioinformatics. Training in these areas is increasingly critical in the biotech industry, and this program will equip students with the skills needed to succeed in the biotech workforce.

The GBNT major will enhance UCR's academic portfolio and provide valuable opportunities for students.

Sincerely,

David Cocker

Chair, Chemical and Environmental Engineering

From: David Nelson <david.nelson@ucr.edu>
Sent: Thursday, February 20, 2025 3:00 PM
To: David Cocker
Cc: david.cocker@ucr.edu
[Quoted text hidden]

[Quoted text hidden]

Department of Bioengineering
Marlan and Rosemary Bourns College of Engineering
900 University Avenue
Riverside, CA 92521

December 4, 2024

TO: Prof. David Nelson, Department of Botany and Plant Sciences
FROM: Xiaoping Hu, Chair, Department of Bioengineering
SUBJECT: Proposed Bachelor of Science Degree Program in Genetics and Biotechnology

Dear David,

The Department of Bioengineering thanks you for soliciting our feedback about the new undergraduate major proposed by the Department of Botany and Plant Sciences. The subjects that are the focus of the new major—genetics, genomics, and bioinformatics—are extremely important, and we enthusiastically support the creation of a new major for preparing UCR students to work in these areas.

However, **we strongly oppose the use of the word "biotechnology" in the name of the proposed major, "Genetics and Biotechnology."** In common use, the term "biotechnology" has expanded far beyond the meaning intended in the proposal and now encompasses virtually all forms of technology in biology and medicine. This will likely lead to confusion among students when selecting their major. We briefly summarize our reasoning for our opposition in this letter.

The meaning of the word "biotechnology" has already changed many times

Researchers have observed that "the word biotechnology has been 'redeveloped' at least four times over the years, and its definition has changed on each occasion" [1]. Most dictionaries still show the definition of "biotechnology" that became widespread in the late 1970s and 1980s, when the term was used to describe genetic engineering. It is in that context that the "Genetics and Biotechnology" proposal uses the term.

The modern meaning of "biotechnology" has expanded far beyond genetics

Along with its abbreviation "biotech," the word "biotechnology" is widely used to refer to all aspects of technology in biology and medicine. A few examples of this usage:

- The **official website of the State of California Office of Business and Economic Development** includes a section entitled "Biotech" that provides details about the

biotechnology industry in California [2]. This section prominently notes that California is the "#1 state exporter of **medical equipment and supplies**." Medical equipment and supplies are clearly not part of the definition of "biotechnology" used in the new major proposal, and they are not covered in the proposed curriculum for the major (they are, however, a key component of the curriculum of the Bioengineering major at UCR).

- The same state website on biotech [2] uses the terms "**biomedical technology**" and "**life science industry**" as synonymous with "biotech." Equating these extremely broad terms with "biotechnology" further demonstrates how extraordinarily broad the meaning of "biotechnology" has become.

- The **US Bureau of Labor Statistics (BLS)** provides guidance to individuals seeking jobs in various fields. The BLS report "Jobs in Biotechnology" [3] agrees that the definition of biotechnology has expanded:

  > *"But what, exactly, is biotechnology?... The answer to that question isn't easy. Some think biotechnology refers only to the manipulation of genetic material, the use of recombinant DNA… Both the modern definition and the technology have expanded to cover many areas related to biology and medicine."*

- The same BLS report [3] lists several fields "within biotechnology." One of these fields is "**Biomedical Engineer**," which the report defines as:

  > *"Engineers [who] are behind innovations such as artificial limbs, edible sensors, and sophisticated monitors used during surgery… they may design laser systems for use in corrective eye surgery or develop artificial organs, imaging systems, and devices for regulating insulin."*

  In other words, this US government report defines biotechnology so broadly that it *includes* biomedical engineering/bioengineering. And again, the topics highlighted by the BLS as "within biotechnology" (artificial limbs, sensors, surgery monitors, laser surgery systems, etc.) feature prominently in the Bioengineering curriculum at UCR but are not covered by the proposed "Genetics and Biotechnology" major.

- The NSF-funded "Biotech Careers" website was created to "serve students and others who are considering biotech careers" [4]. The website curates a list of "biotech employers in California." Nearly 200 of those biotech employers are categorized as "**medical devices**" companies. Again, medical devices are not covered by the proposed "Genetics and Biotechnology" major, but several courses are dedicated to the topic in the Bioengineering major (BIEN 130, BIEN 130L, BIEN 167, and others).

These are just a few examples of authoritative organizations using a definition of "biotechnology" that is far broader than the one used in the new major proposal—a definition so broad that it *includes* biomedical engineering and bioengineering.

Undergraduates also use this broad definition of "biotechnology"

A recent survey of the undergraduates in the Bioengineering major at UCR found that:

- **79%** of student respondents agreed with the statement "**I chose the Bioengineering major because I want to work in the biotechnology industry.**"
- **80%** of student respondents agreed with the statement "**Medical devices (like pacemakers and artificial legs) are examples of biotechnology**."

These responses show that Bioengineering students overwhelmingly view bioengineering and biotechnology as closely related, that they view bioengineering topics such as medical devices as part of biotechnology (even though these topics do not fit the "traditional" definition of biotechnology used in the major proposal), and that **their interest in biotechnology (as they understand it) motivated their decision to select the Bioengineering major**.

Students' interest in a subject is the main determinant of their choice of major

A study of over 700 undergraduates found that the most influential factor in choosing their major was **their interest in the subject** [5]. Interest in the major subject outweighed all other factors in picking a major, including the students' perceived skill in the major, advice they receive from parents/guardians and high school guidance counselors about the major, and even perceived opportunities for jobs and levels of pay in the major.

The Bioengineering major was created nearly 20 years ago to serve students interested in biotechnology

As BCOE Executive Committee Chair and Bioengineering Professor Victor G.J. Rodgers noted in his letter of April 25, 2024,

UC RIVERSIDE

*"Providing a program that fulfills student preparation for **biotechnology careers** was one of the key justifications for starting the Department of Bioengineering in 2006. As stated in the UCR Catalog 2023-24, 'the major in Bioengineering allows students to complete a B.S. degree that provides a basic education to enter the fields of bioengineering and **biotechnology**.'"*

A new major that contains the word "biotechnology" but does not cover the enormous breadth of topics that students associate with biotechnology will likely lead to students choosing the wrong major for their interests

The term "biotechnology" has grown so broad that many future UCR students would likely be interested in a major with "biotechnology" in the name. These biotech-interested students would likely include many who wish to focus on genetics, genomics, and bioinformatics, and those students would undoubtedly be very well served by the contents of the proposed new major.

However, other biotech-interested students might be interested in fields such as **medical devices**, even though these students would be much better served in Bioengineering or other majors in BCOE.

Other biotech-interested students might be interested in **drug development using conventional approaches** (not genetic engineering). Those students would likely be better served in Biochemistry or other majors in CNAS.

Other biotech-interested students may wish to explore **genetics and genomics from an engineering perspective**, and we already do that in several existing Bioengineering courses.

Still other biotech-interested students might be interested in careers in the **health professions** ("pre-meds") and might assume that a major named "biotechnology" is a better choice for pre-meds than other majors in CNAS or BCOE. Dr. Marcus Kaul, Chair of the School of Medicine's Faculty Executive Committee, echoes this concern in his letter of April 15, 2024, in which he worries that the proposed "Genetics and Biotechnology" major "may give students the misconception that it is a premed-type program" and observes that "there is a gap between what is offered as courses and what they claim… the program is."

We appreciate that the Department of Botany and Plant Science would do everything possible to make sure students understand which aspects of biotechnology are actually covered in the new major. However, most students choose their major long before they set foot on campus, and we fear that (as the research cited above suggests) no amount of advising or website content will

overcome students' preconceived notions of what "biotechnology" means when picking their major.

A more specific name will help steer the right students toward the new major

Finally, we suspect that some students who enter our Bioengineering major have specific interests in genetics, genomics, and bioinformatics—interests that might be better served by the new major. In fact, in the previously mentioned survey of our Bioengineering students, over half of the respondents agreed with the statement:

> *"I chose the Bioengineering major because I want to manipulate living organisms (or their components) to produce useful products."*

While we address those topics in some of our Bioengineering courses, those topics would clearly be covered in much greater depth in the proposed new major. A more specific name for the proposed major **would help attract students who might prefer it over Bioengineering and other majors**.

There already exists a Ph.D. program within the Department of Botany and Plant Sciences that seems very similar in subject matter to the proposed new undergraduate major. That Ph.D. program is titled "**Genetics, Genomics, and Bioinformatics**," and that name also seems very suitable for the proposed undergraduate major.

Sincerely,

Xiaoping Hu
Chair, Department of Bioengineering

References

1. M.J. Kennedy. "The evolution of the word 'biotechnology.'" *Trends in Food Science and Technology* 3, 154-156 (1992).

2. https://business.ca.gov/industries/biotech/

3. https://www.bls.gov/careeroutlook/2002/fall/art03.pdf

4. https://www.biotech-careers.org/employers-state-table/CA

5. C.A. Malgwi, M.A. Howe, and P.A. Burnaby. “Influences on students’ choice of college major.” *Journal of Education for Business* 80 (5), 275–282 (2005).

APPENDIX VI. RESPONSE AND SECOND SENATE REVIEW (2025)

UC RIVERSIDE UNIVERSITY OF CALIFORNIA

College of Natural and Agricultural Sciences
UC Division of Agriculture and Natural Resources
Agricultural Experiment Station and Cooperative Extension

Department of Botany and Plant Sciences-072
Riverside, CA 92521-0124

May 1, 2025

To: Kenneth N. Barish, Chair
Riverside Division of the Academic Senate

Re: BS in Genetics and Biotechnology

I am writing to request a vote for approval by the Academic Senate for the Bachelor of Science degree in Genetics and Biotechnology (GNBT) proposed herein. The proposal was reviewed by the Senate in 2023-24 but was not brought forward for a vote by the Chair, Sang-Hee Lee. Below I provide an update on our current progress with courses that were developed for the proposed major and respond to the points of concern raised in last year's Senate review.

Current GNBT course offerings
Six lecture or lab courses and two independent research courses (GNBT 197 and 199) are currently approved under the GNBT subject code. The first offerings of three courses began this academic year (2024-25). All courses will be offered annually beginning in 2025-26.

Future GNBT course offerings
This academic year, BPSC conducted searches for an Assistant Professor in Plant Systems Biology or Biotechnology and an Assistant Professor in Translational Plant Sciences. These hires are likely to develop new courses related to **biotechnology** and **synthetic biology** that will add depth to the Biotechnology component of the major.

Incorporation of GNBT courses into other majors
This year, the Biology; Cell, Molecular, and Developmental Biology; and Biochemistry undergraduate majors approved several GNBT courses for satisfying electives, depth requirements, lab requirements, or related course requirements. The Microbiology, Neuroscience, Entomology, and Plant Biology majors have not yet made decisions about utilizing GNBT courses. GNBT 010 was approved by CHASS as satisfying a science breadth requirement, which will likely increase future enrollments for the course.

Course	CoC approval	first offering	CHASS	BIOL	CMDB	BCH
GNBT 010 Genetics & Society	effective 2024F (5/9/24)	2025W	Breadth req (1/17/25)	not eligible		Elective (2/26/25)
GNBT 100 Biotechnology	effective 2025W (10/30/24)	2025F		*to be discussed*	Depth (11/22/24)	Elective (2/26/25)
GNBT 110 Advanced Genetics	effective 2024F (5/9/24)	2025S		Related Course (2/24/25)	Depth (11/22/24)	Elective (2/26/25)
GNBT 114 Molecular Genetics Lab	effective 2024F (5/9/24)	2026S		*to be discussed*	Lab req (11/22/24)	BCH 110C prereq required
GNBT 120 Analysis of Genomes Lab	effective 2024F (5/9/24)	2025W		Related Course (12/9/24)	Lab req (11/22/24)	Elective (2/26/25)
GNBT 130 Genomes: Structure & Evolution	effective 2024F (5/9/24)	2026W		*to be discussed*	Depth (11/22/24)	Elective (2/26/25)
GNBT 197 Research units	effective 2025W (10/30/24)	2025F				
GNBT 199 Research units	effective 2025W (10/30/24)	2025F				

Voice: 951-827-4619 · Fax: 951.827-4437 · WWW.PLANTBIOLOGY.UCR.EDU

UC RIVERSIDE UNIVERSITY OF CALIFORNIA

College of Natural and Agricultural Sciences
UC Division of Agriculture and Natural Resources
Agricultural Experiment Station and Cooperative Extension

Department of Botany and Plant Sciences-072
Riverside, CA 92521-0124

Response to the 2023-24 Senate review

The concerns raised by BCOE in 2023-24 were focused on two issues:
1) The Department of Bioengineering was founded with the intent of preparing students for biotechnology careers in 2006. Per the course catalog, “The major in Bioengineering allows students to complete a B.S. degree that provides a basic education to enter the fields of bioengineering and biotechnology.” Other programs in BCOE were also noted to provide training relevant to biotechnology careers.
2) Including "Biotechnology" in the program title may be misleading to students who seek a biotechnology career.

Therefore, we were requested by the BCOE Executive Committee to vet the proposal with the departments of Bioengineering, Chemical and Environmental Engineering and Computer Science to minimize any overlap and ambiguities. As requested, we contacted each of these departments to discuss their specific concerns and seek solutions.

The Department of Computer Science and Engineering had no concerns. (see attached letter from Department Chair, Professor Christian Shelton)

The Department of Chemical and Environmental Engineering provided strong support for the major, which they view as a potential pipeline to their MS program in Industrial Biotechnology. (see attached letter from Department Chair, Professor David Cocker)

The Department of Bioengineering expressed enthusiastic support for the content and purpose of the major, but continued to strongly oppose the use of "biotechnology" in the name of the proposed GNBT major. (see attached letter from Department Chair, Professor Xiaoping Hu)

BIEN's arguments against the use of "biotechnology" by GNBT can be summarized as
1) "Biotechnology" has come to mean more than "genetic engineering" and now encompasses many forms of technology related to biology and medicine, such as sensors/testing devices, artificial limbs/organs, and surgical tools.
2) Undergraduates may not appreciate the difference between the forms of biotechnology training offered by Bioengineering and GNBT and therefore may choose the wrong major for their career interests.

We respectfully disagree with these arguments.

The term **biotechnology**, coined by Karl Ereky in 1919, originally referred to using biological systems (e.g. bacteria, yeast, and plants) as tools to produce valuable products. The later work of Paul Berg, the so-called "father of biotechnology" laid the foundations of genetic engineering by establishing recombinant DNA methods. While we fully agree that the meaning of biotechnology has gradually broadened over subsequent decades to encompass a more diverse set of disciplines than genetic engineering, we are by no means being misleading to students in our usage of the word.

Voice: 951-827-4619 · Fax: 951.827-4437 · WWW.PLANTBIOLOGY.UCR.EDU

In fact, genetic engineering remains prominent in the popular conception of biotechnology. For example, DNA images feature prominently in a Google Image search of "Biotechnology." The "Biotechnology" entry in Wikipedia (https://en.wikipedia.org/wiki/Biotechnology), a resource commonly used by students, closely aligns with our vision for the Biotechnology track of the GNBT major. It heavily emphasizes genetic manipulation of biological systems. By contrast, the "Biomedical Engineering" entry (https://en.wikipedia.org/wiki/Biomedical_engineering) closely aligns with the Bioengineering major and emphasizes biomechanics, biomaterials, biomedical optics, tissue engineering, hospital and medical devices (for imaging, implants, bionics, biomedical sensors). Therefore, GNBT course offerings will complement those offered by the BIEN department. This will improve the opportunities for UCR students to gain training in biotechnology-relevant topics rather than lessen them.

The name "Genetics and Biotechnology" implies a connection between the two topics, alluding to the program's focus on the genetic engineering forms of biotechnology. We believe that UCR students are quite capable of determining if BIEN or GNBT courses better match their interests by reading the course catalog descriptions. However, we will also take the following actions to prevent any of the potential confusion anticipated by Bioengineering:
1) We will change the name of the proposed Biotechnology track within the major to Genetic Biotechnology to underscore which subdiscipline of biotechnology we are referring to.
2) We will add the following text to the course catalog description for the Genetics and Biotechnology major:

> "The Genetic Biotechnology track offers more opportunities for organism-specific training in preparation for careers in the biomedical, microbial, or plant biotechnology industries. This track is focused on modifying living systems through genetic manipulation. Students interested in biomedical engineering (e.g. developing artificial limbs or organs, sensors, or medical devices) should enroll instead in the Bioengineering major of the Bourns College of Engineering."

3) In our meetings with first-year undergraduates and transfer students, GNBT faculty advisors and CNAS advisors will bring up the distinctions in subject focus between the BIEN and GNBT majors.

We believe strongly in the use of "Biotechnology" in the name of the proposed major for two reasons. First, we wish to convey the importance of applying genetic knowledge as well as discovering it. Translation of knowledge from genetic research into biotechnological applications is a priority for many CNAS faculty. We seek students who are excited about developing innovative solutions to global problems. Second, we aim to attract students considering future careers in this area. Our major will provide training that is appropriate for seeking employment in the biotechnology industry, which is a robust component of the California economy.

The concerns raised by the School of Medicine were focused on whether "Genetics in Healthcare" track was misleadingly named and could lead students to confuse it with a health/premed program. After discussing the typical expectations for medical school applicants at UCR with Prof. Marcus Kaul, there were no obvious reasons why the GNBT major would be less satisfactory preparation for medical school than any other biological major. Nonetheless, we have changed the name for this track to "Pre-Genetic Counseling" to reflect its original intent. Our selection of courses for this track was based upon researching the typical prerequisites for Genetic Counseling programs.

Voice: 951-827-4619 · Fax: 951.827-4437 · WWW.PLANTBIOLOGY.UCR.EDU

UC RIVERSIDE UNIVERSITY OF CALIFORNIA

College of Natural and Agricultural Sciences
UC Division of Agriculture and Natural Resources
Agricultural Experiment Station and Cooperative Extension

Department of Botany and Plant Sciences-072
Riverside, CA 92521-0124

The School of Public Policy also raised concerns about the "Genetics in Healthcare" track, particularly with regard to the selection of a single course in "Health Psychology" (PSYC 178) that seemed haphazardly placed. This specific course was selected based upon our survey of Genetic Counseling program prerequisites. We agree that there are many more important dimensions to health and disease that are not integrated into this track. However, there is limited space for upper-division course requirements and our intent is to maintain a focus on genetics. Therefore, we have changed the name of this track to "Pre-Genetic Counseling" to indicate this narrower scope.

We have also changed the catalog description to read

> "The Pre-Genetic Counseling track has a reduced lab requirement and focuses on the typical prerequisites for postgraduate genetic counseling programs. It provides preparation for working with human genetic data that may be applicable to healthcare settings."

We hope that these changes address the concerns raised by the Senate units satisfactorily. We look forward to launching the GNBT program in the near future.

Sincerely,

Professor of Genetics
Botany and Plant Sciences
University of California, Riverside
david.nelson@ucr.edu
(951) 827-4397

Voice: 951-827-4619 • Fax: 951.827-4437 • WWW.PLANTBIOLOGY.UCR.EDU

UC RIVERSIDE

Academic Senate
Professor Kenneth Barish
Division Chair

December 9, 2025

David Nelson
GNBT Program Lead Proponent, Department of Botany and Plant Sciences

Re: 2nd Round - Bachelor of Science Degree Program in Genetics and Biotechnology (B.S. in Genetics and Biotechnology [GNBT]

Dear David,

Please see the attached feedback on the subject proposal.

Should you decide to revise and resubmit a proposal for this program, please send it to my attention with a courtesy copy to Senate Executive Director Cherysa Cortez (cherysac@ucr.edu).

Best regards,

Ken Barish
Chair, Academic Senate

Encl.

Cc: CNAS Faculty Executive Committee Chair Tom
Senate Director Cortez
Senate Analyst Beatty
CNAS Faculty Executive Committee Analyst Grawe

School of Public Policy
UNIVERSITY OF CALIFORNIA, RIVERSIDE
INTS 4133 | 900 University Ave
Riverside CA, 92521

TO: Ken Barish, Chair
Riverside Division

FR: Kurt Schwabe, Chair
Executive Committee, School of Public Policy

RE: **[Comments] Proposal: 2nd Round - Bachelor of Science**

Date: October 23, 2025

The Executive Committee of the School of Public Policy has reviewed the **Proposal: 2nd Round - Bachelor of Science.** We appreciate the effort, considerations, and updates from previous comments and concerns we and others raised. ***Previously***, we had three comments:

[SPP Comments:
"In the "Genetics in Healthcare Track" section b, it is unclear:
a. why there is only one class to select (PSYC 178 "Health Psychology"), unlike the other components that offer students a choice in which courses to select to fulfill the area
b. what the goal of this lone course is with respect to the track's curriculum. It appears haphazardly placed.
c. why only this course fulfills that requirement and not also other relevant social and behavioral science courses in CHASS, SPP, or elsewhere that focus on social, cultural, and even political dimensions of health, disease, health care, science, and medicine and thus complement the track's genetic focus as part of the range of contributors to health and disease."

We appreciate the reasoning and recognize that you changed the title of the track to "Pre-Genetic Counseling in Healthcare Track." That said, we are still a bit surprised that there isn't more flexibility for course substitutes for Psychology 178 since (i) there are other courses that provide other important dimension on health from a social science perspective that still seem to fit into your overall objectives and (ii) more viable options would likely lead to fewer impediments from a scheduling perspective for students.

Overall, though, we are supportive of the program.

UC RIVERSIDE | School of Medicine

October 31, 2025

TO: Ken Barish, PhD, Chair, Academic Senate, UCR Division

FROM: Adam Godzik, Ph.D., Chair, Faculty Executive Committee, UCR School of Medicine

SUBJECT: **[Campus Review] Proposal:** ***2nd Round - Bachelor of Science Degree Program in Genetics and Biotechnology (B.S. in Genetics and Biotechnology [GNBT])***

Dear Ken,

The SOM Faculty Executive Committee has reviewed the [Campus Review] Proposed Regulation Change: *Changes to UCR Regulations 2, 3, and 4*

The FEC had no additional comments and approved the changes.

Yours sincerely,

DocuSigned by:
Adam Godzik
F3F7FC0ECB4E4AD...

Adam Godzik, Ph.D.
Chair, Faculty Executive Committee School of Medicine

UC RIVERSIDE

College of Humanities, Arts, and Social Sciences
EXECUTIVE COMMITTEE

October 31, 2025

TO: Ken Barish, Chair
Riverside Division of the Academic Senate

FROM: Iván Aguirre, Interim Chair
CHASS Executive Committee

RE: [Campus Review] Proposal: 2nd Round - Bachelor of Science Degree Program in Genetics and Biotechnology (B.S. in Genetics and Biotechnology [GNBT])

The CHASS Executive Committee reviewed the Proposal: 2nd Round - Bachelor of Science Degree Program in Genetics and Biotechnology (B.S. in Genetics and Biotechnology [GNBT]). The committee is supportive of the B.S. in Genetics and Biotechnology proposal: 2nd Round and has no concerns. The committee reiterates the suggestion from the 1st round of the proposal to consider the pursuit of different ways to intersect with CHASS disciplines, which may add value and interest for the new major.

UC RIVERSIDE | UNIVERSITY OF CALIFORNIA
College of Natural and Agricultural Sciences
Executive Committee

November 4th, 2025

TO: Kenneth N. Barish, Chair, Academic Senate, UCR Division

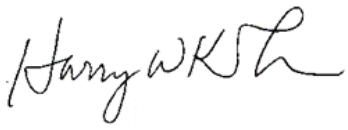
FROM: Harry Tom, Chair, Faculty Executive Committee, College of Natural and Agricultural Sciences

SUBJECT: [Campus Review] Proposal: 2nd Round - Bachelor of Science Degree Program in Genetics and Biotechnology (B.S. in Genetics and Biotechnology [GNBT])

Prof. Barish,

The CNAS Faculty Executive Committee has reviewed the second round proposal for the B.S. in Genetics and Biotechnology and feel that the concerns notated in the first round of review were sufficiently addressed and changes made to the proposal align with provided suggestions. The committee approves the proposal, with no additional comments or suggestions.

Sincerely,



Harry Tom, Ph.D
Chair, Faculty Executive Committee, College of Natural and Agricultural Sciences

R'Mail powered by Google

Cherysa Cortez <cherysac@ucr.edu>

[Campus Review] (Proposal) 2nd Round - Bachelor of Science Degree Program in Genetics and Biotechnology (B.S. in Genetics and Biotechnology [GNBT])

Vagelis Hristidis <vagelish@gmail.com> Wed, Nov 26, 2025 at 1:03 PM
To: Cherysa Cortez <cherysa.cortez@ucr.edu>
Cc: "Rod Smith (roderick.smith@ucr.edu)" <roderick.smith@ucr.edu>

Hi Cherysa,

BIEN faculty met with CNAS faculty and agreed on the following changes:
(1) They have agreed to remove all references to the Bioengineering major from the relevant catalog description.
(2) We reached common ground on renaming the proposed major “Genetics and Molecular Biotechnology” (instead of the originally proposed “Genetics and Biotechnology”).

So I guess BIEN will submit a new version of the proposed degree.

Thanks,
Vagelis
[Quoted text hidden]

UC RIVERSIDE Academic Senate

COMMITTEE ON EDUCATIONAL POLICY

October 3, 2025

To: Ken Barish, Chair
Riverside Division

From: Annie Ditta, Chair
Committee on Educational Policy

Re: Second Round Review of Proposed B.S. in Genetics and Biotechnology

The Committee on Educational Policy (CEP) reviewed the revised proposal for the B.S. in Genetics and Biotechnology at their October 3, 2025 meeting and voted to support the proposal.

UC RIVERSIDE Academic Senate

COMMITTEE ON COURSES

October 24, 2025

To: Ken Barish, Chair
Riverside Division

From: Emma Stapely, Chair
Committee on Courses

Re: Revised Proposal for B.S. in Genetics and Biotechnology

The Committee on Courses reviewed and voted to support the revised proposal for a B.S. in Genetics and Biotechnology at their October 23, 2025 meeting with the reminder that all new course proposals for the curriculum need to be submitted in the Course Request System (CRS).

Received 10/16/25 To Division 1/26/26

COMMITTEE ON EDUCATIONAL POLICY
REPORT TO THE RIVERSIDE DIVISION
February 24, 2026

To Be Adopted

Proposed Changes to Goals of Undergraduate Education in Academic Catalog (p. 67)

PRESENT:

Goals of an Undergraduate Education
The faculty of UCR hereby declare the following set of general educational goals to be pursued through our individual and collective efforts in teaching and guiding the undergraduates of this campus.
~~A university~~ education must help students realize their potential as individuals and contributing participants in society. This involves the acquisition of knowledge and skills, as well as preparation for future responsibilities.

~~A general education provides~~ a framework that enables one to appreciate and critically examine the significant aspects of civilization. This framework is derived from the study of world history; political and economic systems; the ethnic, cultural, and religious diversity of the people of the Earth; the arts and letters of all cultures; the social and natural sciences; and technology. Such a broad education is the foundation for concentrated studies that enable students to prepare for careers and to strive for an understanding of the world in which they live and about which they must make decisions.

PROPOSED:

Goals of an Undergraduate Education
The faculty of UCR hereby declare the following set of general educational goals to be pursued through our individual and collective efforts in teaching and guiding the undergraduates of this campus.
An undergraduate education must help students realize their potential as individuals and contributing participants in society. This involves the acquisition of knowledge and skills, as well as preparation for future responsibilities.

"General Education (GE) is an essential part of an undergraduate education and is completed through the college breadth requirements. These requirements provide a framework that enables one to appreciate and critically examine the significant aspects of civilization. This framework is derived from the study of world history; political and economic systems; the ethnic, cultural, and religious diversity of the people of the Earth; the arts and letters of all cultures; the social and natural sciences; and technology. Such a broad education is the foundation for concentrated studies that enable students to prepare for careers and to strive for an understanding of the world in which they live and about which they must make decisions.

The GE breadth requirements are designed to ensure that students graduate with a well-rounded education and the ability to engage with multiple disciplines. GE courses will

expose students to diverse historical, linguistic, racial, cultural, and scientific perspectives to achieve goals including but not limited to advancing equity and justice, and fostering a more inclusive and sustainable society. These efforts are supported by the development of skills in a non-English language. Through completion of the General Education breadth requirements, students will achieve the following multi- and interdisciplinary learning outcomes by being able to:

1. **Methodology**: formulate and apply reasoning and relevant methodologies to investigate social and natural phenomena.

2. **Information Literacy & Application**: obtain and analyze historical and current information (e.g., empirical data, sources, artistic representations, cultural contexts), assess its quality, and draw evidence-based conclusions about complex issues.

3. **Theories**: assess and apply relevant theoretical models to diverse types of information (e.g., evidence, data, and artistic and literary works).

4. **Systems**: evaluate the theories, principles, and functioning of various systems (e.g., world historical, current political, economic, scientific) and analyze how these systems influence societal structures and individual lives within diverse contexts.

5. **Innovation**: create original solutions, arguments, and/or artistic expressions that draw from diverse knowledge and skills.

~~A university~~ education nurtures the critical skills of oral and written communication, including the exercise of these skills in a language other than one's own. It must teach

An undergraduate education nurtures the critical skills of oral and written communication, including the exercise of these skills in a language other than one's own. It must teach students to become

students to become verbally and quantitatively literate, to analyze and synthesize, and to regard the acquisition of knowledge as a lifetime activity. ~~A university~~ education must promote tolerance of the opinions of others and an understanding of the mutual dependence of human beings on each other and on their natural environment. The student's university years also provide an opportunity to develop integrity, self-esteem, self-discipline, style, humanness, commitment to the general welfare, sensitivity to the interplay of environment and technology, and confidence that the human drama is worthy of a lengthy future.

verbally and quantitatively literate, to analyze and synthesize, and to regard the acquisition of knowledge as a lifetime activity. An undergraduate education must promote tolerance of the opinions of others and an understanding of the mutual dependence of human beings on each other and on their natural environment. The student's university years also provide an opportunity to develop integrity, self-esteem, self-discipline, style, humanness, commitment to the general welfare, sensitivity to the interplay of environment and technology, and confidence that the human drama is worthy of a lengthy future.

(No change)

UCR has three undergraduate colleges and three undergraduate schools that offer bachelor's degrees: Humanities, Arts, and Social Sciences; Natural and Agricultural Sciences; and Engineering. UCR also has the School of Business, School of Education, and the School of Public Policy that offer bachelor's degrees.

(No change)

Requirements for the Bachelor's Degree
Requirements for the bachelor's degree vary according to the college and major selected. There are three kinds of requirements: general university, college, and major.

(No change)

1. General University requirements
   Entry-Level Writing
   American History and Institutions
   Unit
   Scholarship
   Residence

2. College breadth requirements
   English Composition
   Humanities
   Social Sciences
   Ethnicity
   Foreign Language
   Natural Sciences and Mathematics

2. College breadth requirements
   English Composition
   Humanities
   Social Sciences
   Ethnicity
   Foreign Language
   Natural Sciences and Mathematics
   Additional Courses

Additional Courses

(No change)

3. Major requirements (No change)
   Lower-Division or Core Courses
   Upper-Division Courses

Students should plan a program of study carefully and consult an academic advisor. Students are responsible for meeting all requirements for graduation.

Statement of Purpose and Effect:

These changes are being proposed in order to address the Coordinating Committee on General Education (CCGE)'s recommendations for developing General Education learning objectives. These objectives have now been added into the catalog. Additional edits for clarity between previously confusing concepts (e.g., "university education," a "general education framework," and "general education") have been made.

Approval:

Approved by the Committee on Educational Policy: January 9, 2026

Endorsed by Executive Council: January 26, 2026

UC RIVERSIDE

Academic Senate
Professor Kenneth Barish
Division Chair

December 18, 2025

Annie Ditta
Chair, Committee on Educational Policy

RE: Proposed Changes to Goals of Undergraduate Education in Academic Catalog (p. 67)

Dear Annie and CEP Colleagues,

Many thanks for moving UCR forward with the Senate's efforts to implement the recommendations of the Coordinating Committee on General Education by submitting the *Proposed Changes to Goals of Undergraduate Education in Academic Catalog (p. 67)*. I write to provide the attached Senate committee feedback on this proposal and ask that CEP take the comments into consideration in a revised proposal.

Please submit the revised proposed changes to my attention with a courtesy copy to Senate Executive Director Cherysa Cortez (cherysac@ucr.edu) before January 12, 2026 so that Executive Council may include it on an early 2026 agenda and give it the best chance to be added to the Winter division meeting agenda for action.

Sincerely,

Ken Barish
Academic Senate Chair

Encl.

Cc: Senate Analyst Beatty
Senate Director Cortez

UC RIVERSIDE | UNIVERSITY OF CALIFORNIA | College of Natural and Agricultural Sciences
Executive Committee

November 26th, 2025

TO: Kenneth N. Barish, Chair, Academic Senate, UCR Division

FROM: Harry Tom, Chair, Faculty Executive Committee, College of Natural and Agricultural Sciences

SUBJECT: [Campus Review] Proposal: Proposed Changes to Goals of Undergraduate Education in Academic Catalog (p. 67)

Prof. Barish,

The CNAS Faculty Executive Committee has reviewed the proposed revisions to the Academic Catalog Goals of Undergraduate Education (p.67) at their November 25th meeting and had comments to provide to the Senate.

The committee feels that the following portion of the proposed content to be added seems redundant to the content in the two paragraphs proceeding it and would suggest its removal:

“The GE breadth requirements are designed to ensure that students graduate with a well-rounded education and the ability to engage with multiple disciplines in the arts, humanities, social sciences and sciences. GE courses will expose students to diverse historical, linguistic, racial, cultural, and scientific perspectives to achieve goals including but not limited to advancing equity and justice, and fostering a more inclusive and sustainable society. These efforts are supported by the development of skills in a non-English language.”

The committee would also like to address that the generalized list of disciplines described in the existing content is very CHASS-centric and unbalanced:

“This framework is derived from the study of world history; political and economic systems; the ethnic, cultural, and religious diversity of the people of the Earth; the arts and letters of all cultures; the social and natural sciences; and technology.”

The committee would like to request that the section “...the social and natural sciences…” be updated to be more inclusive of the other disciplines that are housed within the College of Natural and Agricultural Sciences to state content similar to “...the social, natural, and agricultural sciences; mathematics and statistics;...” This concern was also raised within the paragraph this committee has already noted above where the distinction is even more prominent, citing just “...and sciences” as the reflection of the College of Natural and Agricultural Sciences contribution to the students’ well-rounded education.

Sincerely,

Harry Tom, Ph.D
Chair, Faculty Executive Committee, College of Natural and Agricultural Sciences

UC RIVERSIDE

College of Humanities, Arts, and Social Sciences
EXECUTIVE COMMITTEE

October 30, 2025

TO: Ken Barish, Chair
Riverside Division of the Academic Senate

FROM: Iván Aguirre, Interim Chair
CHASS Executive Committee

RE: [Campus Review] Proposal: Proposed Changes to Goals of Undergraduate Education in Academic Catalog (p. 67)

The CHASS Executive Committee reviewed the Proposal: Proposed Changes to Goals of Undergraduate Education in Academic Catalog (p. 67). The proposal expanded on the definition of General Education breadth requirements and provided clear learning outcomes. The committee supported and approved the proposal.

UC RIVERSIDE Academic Senate

COMMITTEE ON DIVERSITY, EQUITY, & INCLUSION

November 3, 2025

To: Kenneth Barish, Chair
Riverside Division Academic Senate

From: Esra Kurum, Chair 
Committee on Diversity, Equity, & Inclusion

Re: [Campus Review] (Proposal) Proposed Changes to Goals of Undergraduate Education in Academic Catalog (p. 67)

The Committee on Diversity, Equity, and Inclusion (CODEI) has reviewed the above proposal and notes the broad and encompassing nature of the proposed changes. Seeing this to allow for individual schools and colleges to adhere to catalog requirements as best suits their needs, CODEI is in support of these changes and has no further comments.

UC RIVERSIDE Academic Senate

COMMITTEE ON FACULTY WELFARE

November 26, 2025

To: Kenneth Barish, Chair
Riverside Division Academic Senate

From: Salman Asif, Chair
Committee on Faculty Welfare

Re: [Campus Review] *Proposed Changes to Goals of Undergraduate Education in Academic Catalog (p. 67)*

The Committee on Faculty Welfare (CFW) reviewed the *Proposed Changes to Goals of Undergraduate Education in Academic Catalog (p. 67).* The majority of CFW members generally support the proposed changes. One member, however, thinks that the proposed changes are unnecessary and poorly timed.

TO: Ken Barish, Chair
Riverside Division

FR: Kurt Schwabe, Chair
Executive Committee, School of Public Policy

RE: **[Comments] Proposed Changes to Goals of Undergraduate Education in Academic Catalog**

Date: November 30th, 2025

The Executive Committee of the School of Public Policy has reviewed the **Proposed Changes to Goals of Undergraduate Education in Academic Catalog**. We appreciate the effort and updates to the catalog provided by the Committee on Education Policy. We have no additional comments or recommendations.

UC RIVERSIDE Academic Senate

COMMITTEE ON COURSES

October 24, 2025

To: Ken Barish, Chair
Riverside Division

From: Emma Stapely, Chair
Committee on Courses

Re: Proposed Changes to Goals of Undergraduate Education in Academic Catalog

The Committee on Courses reviewed and voted to support the proposed changes to the Goals of Undergraduate Education in the academic catalog at their October 23, 2025 meeting.

UC RIVERSIDE Academic Senate

PLANNING AND BUDGET

November 24, 2025

To: Kenneth Barish, Chair
Riverside Division

From: David Oglesby, Chair
Committee on Planning and Budget

Re: **[Campus Review] Proposal:** ***Proposed Changes to Goals of Undergraduate Education in Academic Catalog (p. 67)***

At our meeting on October 28, 2025, the Committee on Planning and Budget (CPB) reviewed the *Proposed Changes to Goals of Undergraduate Education in Academic Catalog (p. 67)*. CPB did not see any budget-related red flags and has no objections to the proposed changes.

11/24/2025

To: Kenneth Barish, Chair of the Assembly of the Academic Senate
and Cherysa Cortez, Executive Director of the UCR Academic Senate

From: Kinnari Atit, Ph.D., Faculty Chair of the School of Education Executive Committee

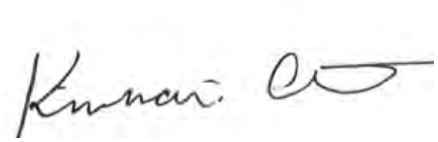
Subject: Proposed Changes to Goals of Undergraduate Education in Academic Catalog

The SOE Executive Committee reviewed the "Proposed Changes to Goals of Undergraduate Education in Academic Catalog". Comments/feedback were solicited at our executive committee meeting and via email.

Comments from the SOE FEC were largely grammatical in nature:
Consistency of sentence structure: In third paragraph of proposed change to Goals of an Undergraduate Education, oxford comma not used when listing multiple disciplines but used elsewhere; also, GE abbreviation used but then written out later in same paragraph.

Thank you for the opportunity to provide feedback.

Sincerely,



Kinnari Atit
Chair, Faculty Executive Committee
School of Education
University of California, Riverside
Email: kinnari.atit@ucr.edu

UC RIVERSIDE | School of Medicine

November 25, 2025

TO: Ken Barish, PhD, Chair, Academic Senate, UCR Division

FROM: Adam Godzik, Ph.D., Chair, Faculty Executive Committee, UCR School of Medicine

SUBJECT: **[Campus Review] Proposal: *Proposed Changes to Goals of Undergraduate Education in Academic Catalog (p. 67)***

Dear Ken,

The SOM Faculty Executive Committee has reviewed the *Proposed Changes to Goals of Undergraduate Education in Academic Catalog (p. 67)*, which are mainly for clarity and alignment with external recommendations.

The FEC has no further comments.

Yours sincerely,

DocuSigned by:
Adam Godzik
F3F7FC0ECB4E4AD...

Adam Godzik, Ph.D.
Chair, Faculty Executive Committee School of Medicine

COMMITTEE ON EDUCATIONAL POLICY
REPORT TO THE RIVERSIDE DIVISION

To Be Adopted

Proposed Changes to Goals of Undergraduate Education in Academic Catalog (p. 67)

PRESENT:

Goals of an Undergraduate Education
The faculty of UCR hereby declare the following set of general educational goals to be pursued through our individual and collective efforts in teaching and guiding the undergraduates of this campus.
~~A university~~ education must help students realize their potential as individuals and contributing participants in society. This involves the acquisition of knowledge and skills, as well as preparation for future responsibilities.

~~A general education provides~~ a framework that enables one to appreciate and critically examine the significant aspects of civilization. This framework is derived from the study of world history; political and economic systems; the ethnic, cultural, and religious diversity of the people of the Earth; the arts and letters of all cultures; the social and natural sciences; and technology. Such a broad education is the foundation for concentrated studies that enable students to prepare for careers and to strive for an understanding of the world in which they live and about which they must make decisions.

PROPOSED:

Goals of an Undergraduate Education
The faculty of UCR hereby declare the following set of general educational goals to be pursued through our individual and collective efforts in teaching and guiding the undergraduates of this campus.
An undergraduate education must help students realize their potential as individuals and contributing participants in society. This involves the acquisition of knowledge and skills, as well as preparation for future responsibilities.

"General Education (GE) is an essential part of an undergraduate education and is completed through the college breadth requirements. These requirements provide a framework that enables one to appreciate and critically examine the significant aspects of civilization. This framework is derived from the study of world history; political and economic systems; the ethnic, cultural, and religious diversity of the people of the Earth; the arts and letters of all cultures; the social and natural sciences; and technology. Such a broad education is the foundation for concentrated studies that enable students to prepare for careers and to strive for an understanding of the world in which they live and about which they must make decisions.

The GE breadth requirements are designed to ensure that students graduate with a well-rounded education and the ability to engage with multiple disciplines in the arts, humanities, social sciences and sciences. GE

courses will expose students to diverse historical, linguistic, racial, cultural, and scientific perspectives to achieve goals including but not limited to advancing equity and justice, and fostering a more inclusive and sustainable society. These efforts are supported by the development of skills in a non-English language. Through completion of the General Education breadth requirements, students will achieve the following multi- and interdisciplinary learning outcomes by being able to:

1. **Methodology**: formulate and apply reasoning and relevant methodologies to investigate social and natural phenomena.

2. **Information Literacy & Application**: obtain and analyze historical and current information (e.g., empirical data, sources, artistic representations, cultural contexts), assess its quality, and draw evidence-based conclusions about complex issues.

3. **Theories**: assess and apply relevant theoretical models to diverse types of information (e.g., evidence, data, and artistic and literary works).

4. **Systems**: evaluate the theories, principles, and functioning of various systems (e.g., world historical, current political, economic, scientific) and analyze how these systems influence societal structures and individual lives within diverse contexts.

5. **Innovation**: create original solutions, arguments, and/or artistic expressions that draw from diverse knowledge and skills.

~~A university~~ education nurtures the critical skills of oral and written communication, including the exercise of these skills in a language other than one's own. It must teach students to become verbally and

An undergraduate education nurtures the critical skills of oral and written communication, including the exercise of these skills in a language other than one's own. It must teach students to become

quantitatively literate, to analyze and synthesize, and to regard the acquisition of knowledge as a lifetime activity. ~~A university~~ education must promote tolerance of the opinions of others and an understanding of the mutual dependence of human beings on each other and on their natural environment. The student's university years also provide an opportunity to develop integrity, self-esteem, self-discipline, style, humanness, commitment to the general welfare, sensitivity to the interplay of environment and technology, and confidence that the human drama is worthy of a lengthy future.

verbally and quantitatively literate, to analyze and synthesize, and to regard the acquisition of knowledge as a lifetime activity. An undergraduate education must promote tolerance of the opinions of others and an understanding of the mutual dependence of human beings on each other and on their natural environment. The student's university years also provide an opportunity to develop integrity, self-esteem, self-discipline, style, humanness, commitment to the general welfare, sensitivity to the interplay of environment and technology, and confidence that the human drama is worthy of a lengthy future.

UCR has three undergraduate colleges and three undergraduate schools that offer bachelor's degrees: Humanities, Arts, and Social Sciences; Natural and Agricultural Sciences; and Engineering. UCR also has the School of Business, School of Education, and the School of Public Policy that offer bachelor's degrees.

(No change)

Requirements for the Bachelor's Degree
Requirements for the bachelor's degree vary according to the college and major selected. There are three kinds of requirements: general university, college, and major.

(No change)

1. General University requirements
   Entry-Level Writing
   American History and Institutions
   Unit
   Scholarship
   Residence

(No change)

2. College breadth requirements
   English Composition
   Humanities
   Social Sciences
   Ethnicity
   Foreign Language
   Natural Sciences and Mathematics
   Additional Courses

2. College breadth requirements
   English Composition
   Humanities
   Social Sciences
   Ethnicity
   Foreign Language
   Natural Sciences and Mathematics
   Additional Courses

(No change)

3. Major requirements
   Lower-Division or Core Courses (No change)
   Upper-Division Courses

Students should plan a program of study carefully and consult an academic advisor. Students are responsible for meeting all requirements for graduation.

Statement of Purpose and Effect:
These changes are being proposed in order to address the Coordinating Committee on General Education (CCGE)'s recommendations for developing General Education learning objectives. These objectives have now been added into the catalog. Additional edits for clarity between previously confusing concepts (e.g., "university education," a "general education framework," and "general education") have been made.

Approval:
Approved by the Committee on Educational Policy: October 3, 2025
The Committee on Rules and Jurisdiction finds the wording to be consistent with the code of the Academic Senate:
Received by Executive Council:

Received Academic Senate
October 22, 2025

To Division
December 8, 2025

COMMITTEE ON UNIVERSITY EXTENSON
REPORT TO THE RIVERSIDE DIVISION

To Be Adopted

Proposed Changes to Charge of the Committee on University Extension
(Bylaw 8.25)

PRESENT:	**PROPOSED:**
08.25 University Extension	**(No change)**
08.25.01 This committee consists of six members. (Am 9 Jan 73)(Am 20 Nov 85)(Am 28 May 98)	**(No change)**
08.25.02 It is the duty of this committee to:	**(No change)**
08.25.02.01 Advise the Chancellor and the ~~director~~ of University Extension on matters referred by the to the committee;	**08.25.02.01** Advise the Chancellor and the Dean of University Extension on matters referred by them to the committee;
08.25.02.02 Initiate recommendations to the Chancellor and the ~~director~~ of University Extension concerning the function and the educational and related budgetary and personnel policies of University Extension;	**08.25.02.02** Initiate recommendations to the Chancellor and the Dean of University Extension concerning the function and the educational and related budgetary and personnel policies of University Extension;
08.25.02.03 Review the annual report of the ~~director~~ of University Extension and submit an annual report and such interim special reports as seem advisable to the Division;	**08.25.02.03** Review the annual report of the Dean of University Extension and submit an annual report and such interim special reports as seem advisable to the Division;
08.25.02.04 Advise the ~~director~~ of University Extension and the departments, colleges, and Graduate Division with respect to:	**08.25.02.04** Advise the Dean of University Extension and the departments, colleges, and Graduate Division with respect to:
08.25.02.04.01 Establishment, continuance, and discontinuance of Extension programs;	**(No change)**
08.25.02.04.02 Criteria for appointment and retention of Extension teaching staff;	**(No change)**

08.25.02.04.03 Policy concerning acceptance of financial support for Extension programs from sources outside the University;	**(No change)**
08.25.02.04.04 Establishment of requirements for admission to Extension courses yielding credit toward an academic degree;	**(No change)**
08.25.02.04.05 Coordination of the relations of University Extension with the Division;	**(No change)**
08.25.02.05 Recommend and supervise all University Extension courses in the Division yielding credit; in discharging this responsibility the Committee on University Extension presents its recommendations on all courses numbered below 300 to the Committee on Courses for review and approval (read Bylaw 8.10.2), but the committee is empowered to give final approval to all University Extension courses above the 200 series, provided that it reports all such action taken to the Division at least once each quarter.	**(No change)**

Statement of Purpose and Effect:
The Committee has proposed changes to correct the title of the Director of University Extension to the Dean of University Extension as the Director title no longer exists.

Approvals:

Approved by the Committee on University Extension:	October 22, 2025
The Committee on Rules and Jurisdiction finds the wording to be consistent with the code of the Academic Senate:	November 17, 2025
Received by Executive Council:	December 8, 2025

Received 11/2/25
Academic Senate

To Division
1/12/26

COMMITTEE ON DIVERSITY, EQUITY & INCLUSION

REPORT TO THE RIVERSIDE DIVISION
December 2, 2025

To Be Adopted

Proposed Changes to Charge of the Committee on Diversity, Equity & Inclusion
Bylaw 8.6.1

PRESENT:	**PROPOSED:**
8.6.1 This committee consists of eight members of the Division, including, the Associate Vice Chancellor and Chief Diversity Officer as non-voting ex-officio. (Am 23 May 17)(EC 30 Nov 21)	8.6.1 This committee consists of eight members of the Division, including, the Vice Chancellor of Diversity, Equity & Inclusion as non-voting ex-officio member. (Am 23 May 17)(EC 30 Nov 21)

Statement of Purpose and Effect: To bring the Committee bylaws into alignment with the current practice and title of the non-voting ex-officio member.

Section below is for Senate use only

Approved by the Committee on Diversity, Equity, and Inclusion: October 23, 2025

The Committee on Rules and Jurisdiction finds the wording to be consistent with the code of the Academic Senate: November 25, 2025

Received by Executive Council: January 12, 2026

Received 11/17/25
Academic Senate

To Division
1/27/26

SCHOOL OF MEDICINE FACULTY EXECUTIVE COMMITTEE
REPORT TO THE RIVERSIDE DIVISION
Fall 2025

To Be Adopted

Proposed Changes School of Medicine Bylaw ME 05.06

PRESENT:

ME05.06

There shall be a Graduate Advisory Committee consisting of ~~two Senate Graduate Advisors and three Senate faculty members. One Graduate Advisor will be responsible for recruitment and admission of graduate students and the other Graduate Advisor will be responsible for enrolled student affairs. All Biomedical Sciences Graduate Program faculty members in good standing are eligible for service on the Graduate Advisory Committee. Graduate Advisors and other members of the committee are appointed~~ by the Faculty Executive Committee in consultation with the Chair of the Division of Biomedical Sciences. Appointments are made ~~annually~~, with no term limit. The Faculty Executive Committee will also nominate the Graduate Program Director. Th~~is~~ nomination shall be communicated to the Dean of the Graduate Division who consults with Senior Administration in the School before forwarding a nomination to the EVC/Provost. One or other of the Graduate Program Advisors may also serve as Graduate Program Director. The duty of the Graduate Program Director is to represent the Program within the School, as well as on campus. All appointed members have the right to vote whether members of the Academic Senate or not. (Am 21 Feb 2012) (Am 25 Feb 2014)

PROPOSED:

ME 05.06

There shall be a Graduate Advisory Committee consisting of **one Senate Graduate Advisor from each School of Medicine Graduate program as well as four Senate faculty members, consisting of two Clinical Sciences Division and two Biomedical Sciences Division. All School of Medicine faculty who belong to a School of Medicine Graduate program are eligible for service on the Graduate Advisory Committee. All members of the committee are appointed** by the Faculty Executive Committee in consultation with the Chair**s** of the Division**s** of Biomedical Sciences and **Clinical Sciences.** Appointments are made **for up to three years,** with no term limit. **The Faculty Executive Committee will select the Chair of the Graduate Advisory Committee from one of the four faculty not serving in a Graduate Program Director role to serve up to three years, with a two-term limit.** The Faculty Executive Committee will also nominate the Graduate Program Director**s of all School of Medicine graduate programs.** Th**ese** nomination**s** shall be communicated to the Dean of the Graduate Division**,** who consults with senior administration in the School before forwarding a nomination to the EVC/Provost. One or other of the Graduate Program Advisors may also serve as Graduate Program Director. The duty of the Graduate Program Director is to represent the Program within the School, as well as on campus. All appointed members have the

right to vote, whether members of the Academic Senate or not. (Am 21 Feb 2012) (Am 25 Feb 2014)

Statement of Purpose and Effect: T
The proposed revision to the composition of the Graduate Advisory Committee aims to ensure equal representation for all graduate programs including PhD and master's degrees at the School of Medicine. The changes will establish longer-term appointments for committee members and implement staggered rotations, promoting continuity and consistent oversight. Under this revision, the Faculty Executive Committee (FEC**)** will nominate all graduate program directors to serve on the committee. This structure will strengthen support for all School of Medicine graduate programs and align UCR SOM with the best practices adopted by other UC medical schools in the governance and management of graduate education.

Approved by the SOM Faculty Executive Committee on 11/06/2025
Or
Submitted by Adam Godzik, PhD, Chair of SOM Faculty Executive Committee on 11/07/2025

Section below is for Senate use only

(if applicable)Approved by the Committee on_____:

The Committee on Rules and Jurisdiction finds the wording to be consistent with the code of the Academic Senate: 1/27/26
Received by Executive Council: 1/12/26

R&J modifications listed in the letter below were accepted and incorporated by the proponents on 1/27/26

UC RIVERSIDE Academic Senate

COMMITTEE ON RULES AND JURISDICTION

Date: December 3, 2025

To: Kenneth Barish, Chair
Riverside Division

From: Randolph C. Head, Chair
Committee on Rules and Jurisdiction

Re: [Campus Review] Bylaw Change: *Proposed Changes School of Medicine Bylaw ME 05.06 (Graduate Advisory Committee - GAC)*

The Committee on Rules and Jurisdiction has carefully considered *Proposed Changes to School of Medicine Bylaw ME 05.06 (Graduate Advisory Committee - GAC).* The Committee appreciates that the proposed bylaw changes are meant to ensure equal representation for SOM graduate programs to strengthen support for all SOM graduate programs. With this, R&J believes the proposed regulations would benefit from minor modifications to increase clarity and consistency. If completed, the committee approves of this bylaw change with no additional committee review.

The Committee on Rules and Jurisdiction offers the following to assist in the above:

Line 5-7 Revision. "four Senate faculty members that consists of…Division."

Suggested alternative: "four Senate faculty members, consisting of two from the Clinical Sciences Division and two from the Biomedical Sciences Division."

Line 8 Revise "…of Medicine faculty that belong…" to "…of Medicine faculty **who** belong…"

Line 18 Delete "also" - "…Executive Committee will [] select the Chair…"

Line 27 Add comma: "… the Dean of the Graduate Division**,** who consults…"

Line 30 "Senior Administration" does not need to be capitalized, as it is not a title.

Line 38 Add comma: "… right to vote**,** whether members of the Academic Senate or not."

UC RIVERSIDE

Academic Senate

COMMITTEE ON COMMITTEES

December 4, 2025

To: Kenneth Barish, Chair
Riverside Division

From: Francesca Hopkins, Chair
Committee on Committees

Re: [Campus Review] (Bylaw Change) Proposed Changes School of Medicine Bylaw ME 05.06 (Graduate Advisory Committee - GAC)

The Committee on Committees (CoC) discussed the Proposed Changes to the School of Medicine Bylaw ME 05.06 – Graduate Advisory Committee at their December 4, 2025 meeting. CoC has no comments or suggested revisions and was supportive of the proposed changes.

UC RIVERSIDE

Academic Senate

GRADUATE COUNCIL

December 11, 2025

To: Kenneth Barish, Chair
Riverside Division

From: Viji Santhakumar, Chair
Graduate Council

RE: [Campus Review] (Bylaw Change) Proposed Changes School of Medicine Bylaw ME 05.06 (Graduate Advisory Committee - GAC)

Graduate Council reviewed and discussed the proposed changes to the School of Medicine Bylaw ME 05.06 (Graduate Advisory Committee – GAC) at their December 11, 2025 meeting. The Council approved of the proposed bylaw changes.