

**R’Horizons:**  
**Proposal for a New UCR General Education Curriculum**

Academic Senate Committee to Review General Education

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## **I. Introduction**

The current breadth requirements represent an approach to general education that reflects long-held values of undergraduate instruction at UCR. Their strengths include great flexibility for students to choose courses in which they are interested; the opportunity to learn about fields in which they may wish to major should their current majors prove unsatisfying; and sufficient breadth to meet the traditional objective of general education to enrich students' college experience by broadening their understanding of the cultural, social, and natural worlds. In addition, many of the courses offered through general education are designed to situate the particular subject matter within a broader framework. For example, some courses in earth science connect the scientific issues surrounding topics like climate and ocean life with the associated ethical, societal, and political implications. Moreover, the current system allows for faculty engagement in updating and innovating general education courses.

Why then do we propose a significant revision of the general education curriculum?

One reason is that any curriculum that has remained virtually unchanged, and not subject to critical review, for four decades should be considered in need of examination. Every undergraduate and graduate program on campus is expected to be reviewed on a seven-year cycle. General education has been the exception. Given the technological, sociopolitical, and economic changes over the past 40 years, a curriculum designed without the current UCR students and faculty in mind at minimum requires critical evaluation. We conducted this evaluation and found that improvement is both possible and desirable. Taken as a whole, the evidence we collected also points in directions that improvement can take.

The new curriculum has a much stronger emphasis on interdisciplinary courses and courses attuned both to perennially important topics and the momentous issues of our time. It creates opportunities for students to learn about topics in five major categories of knowledge and experience: creativity, history, society, nature, and technology, and it also includes courses in foundational skills. It provides opportunities for groups of faculty to offer thematically-linked courses and for colleges to add additional requirements as they see fit. This subject matter is intertwined with a structure of skill development in core competency areas, building from introductory to innovative work. The new curriculum will be overseen by a Senate standing committee whose members will approve course proposals and monitor course effectiveness. Many existing general education courses will qualify with minor modifications for inclusion in the R'Horizons curriculum.

The new curriculum is intended to broaden students' horizons and deepen their knowledge. This distribution fosters multi-disciplinary engagement across fields and interdisciplinarity within subjects. After all, scientists need to communicate effectively be it through presentations or grant proposals. They must use creativity to design, for instance, technology that accounts for economic inequalities, just as artists need to comprehend histories of aesthetics and politics in order to shape creative works that express ideas and inspire audiences' critical thinking on subjects like environmental racism. By incorporating learning goals and skills such as clear communication; sound reasoning; applied research methods; and information, media, and mathematical literacy, general education courses enable students to identify problems, understand context, propose solutions, and ultimately contribute to the City of Riverside, inland Southern California, and beyond.

We begin by reporting on the evidence we have collected on the need for improvement. We then discuss the philosophy that guided our work on the proposed curriculum. Next we offer a new curriculum that creates synergies between breadth and depth of learning and the development of essential skills. The proposal then concludes with a discussion of logistics, including a proposed course approval process, incentives for participation, and a timeline for implementation.

## II. The Need for Improvement

The General Education Review Committee collected data from (1) a committee-designed survey of UCR undergraduate students, (2) focus groups with advisors, (3) panel discussions with alumni, (4) analysis of the Student Experience in the Research University/University of California Undergraduate Experience Survey (SERU/UCUES) surveys, and (5) analysis of a national survey of employers conducted by the American Association of Colleges & Universities (AAC&U). We do not discuss the SERU/UCUES surveys because they proved to be of limited value. But we do include them, together with a more detailed analysis of the other sources, in an accompanying supplemental report (see Supplemental Report No. 1).

### Evidence from the Student Survey

The most valuable evidence we collected comes from UCR undergraduates' report of their experiences of general education. Nearly 2,300 UCR undergraduates, approximately 10 percent of the student body, filled out a survey, which was fielded in October and November 2020. The survey included questions that asked students to compare their learning experiences in general education courses relative to courses in their majors. It also included questions that focused on specific general education requirements.

As compared to courses in their majors, students assessed their general education courses as ineffective in preparing them for their future careers, addressing the critical issues that they will be facing, or offering project-based learning to stimulate their interest and improve their skills. The comparatively weak performance of general education courses in conveying projected needs and issues of the future is particularly problematic insofar as one of our goals for general education courses is to address precisely these kinds of issues. Similarly, one of the long-standing goals of general education is to approach topics from multiple disciplinary perspectives, and here, too, general education courses were evaluated as significantly less successful than courses in students' majors. In addition, students' assessments of the design and teaching of general education courses typically fell below the level of courses in the major. Students' open-ended comments about required language courses were frequently negative. Students and alumni identified the need for more attention to oral communication skills. Most concerning is the very low level of satisfaction students indicated when asked whether general education has been one of the most important features of their UCR education.

### Evidence from the Advisor and Alumni Panels

The Committee met in focus groups with 19 college advisors across all undergraduate colleges and schools. According to the advisors, only a few courses stand out in students' minds as outstanding, and these courses are popular mainly

because of the excellence of instructors rather than because of the course content. According to the advisors, many students complain about the language courses, wondering whether they are necessary. Students also express concerns about whether they should be required to pay fees associated with testing out of these classes. Many students would like to see more general education courses that connect with their majors. Advisors worried that students had too few experiences in general education to aid their analytical and critical thinking abilities and their oral communication skills. Most advisors also felt that a life skills course emphasizing topics like financial literacy, stress management, and professional conduct would be valuable for students.

The Committee also met with panels consisting of 20 alumni. The alumni cited public speaking as the single most important skill that they found missing in their own general education experiences. Several others mentioned that courses did not provide enough challenge in terms of analytical and critical thinking. Some alumni mentioned the need to learn “soft skills” to complement academic skills. For the alumni, these soft skills included teamwork, negotiating differences between colleagues, working with people from different cultural and political backgrounds, and professional norms of interaction. This theme came through as well in the frequent mention by alumni panelists of the desirability of a life skills course to complement academic skill building courses.

### Evidence from National Employers Surveys

Our final piece of evidence supports the notion that general education can better prepare students for social mobility opportunities. It comes from the two most recent surveys of employers conducted by American Association of Colleges & Universities, the first in 2013 and the most recent in 2018. Among the college learning outcomes examined in 2018, both executives and hiring managers placed the highest importance on oral communication skills. In addition, both executives and hiring managers rated critical thinking, ethical judgment, working effectively in teams, working independently, self-motivation, written communication, and real-world application of skills and knowledge as important for workplace success. Based on the other evidence we collected, the current UCR general education curriculum appears to be deficient in several of these areas, particularly oral communication, critical thinking, ethical judgment, and real-world applications.

### Conclusions from a Review of the Evidence

The conclusions we draw from this evidence are as follows: UCR would be well served by including more general education courses that consider topics of importance to the past, present, and future taught from a multidisciplinary perspective. The new curriculum should emphasize multidisciplinary approaches to a greater degree so that students can see how the subject matter of their majors is viewed in the context of other disciplinary concerns and approaches. These courses

should include more project-based learning experiences. The campus needs to find ways to encourage our best teachers to engage with general education courses. The new general education curriculum also needs to incorporate ways to help students improve their oral communication as well as their analytical and critical thinking skills. Moreover, the new curriculum should provide avenues for students to develop skills that will improve their success at work and in life, including instruction in financial literacy, methods to aid in time and stress management, and norms of professional interaction.

### **III. Guiding Philosophy**

General education should reflect UC's and UCR's mission statements and the vision and values of UCR as they relate to the undergraduate educational experience.

These statements are provided in Appendix A. They indicate that the long-term objective of general education is to aid students in becoming rational thinkers and effective contributors to society. We also think general education should address students' interests in attaining career success and leading rewarding lives. General education fulfills these objectives by providing students with an understanding of the world beyond what is provided by their majors. Its purpose is many-fold and includes:

- Broadening students' horizons by preparing them to participate effectively in a complex and changing society

- Equipping students with skills that make that effective participation possible
- Presenting students with the methods used by different disciplines to advance knowledge
- Illustrating to students the context in, and means by which, knowledge is evaluated, accepted or rejected, and applied

By achieving these objectives, students will be able to think and communicate clearly and effectively.

General education courses must therefore provide students with many opportunities to develop their writing, speaking, and reasoning skills, as well as introduce them to the contributions of important scholars, artists, and public figures. Skill development in these domains will include instruction in the elements of rhetoric, style, and logic. It will also include understanding audience expectations, how words and sentiments can mean different things to different people, and a reflexive outlook that allows a critical awareness of one's own biases and limited experiences.

UCR's vision statement includes a commitment to "transform the lives of the diverse people of California, the nation, and the world through the discovery, communication, translation, application, and preservation of knowledge." General education at UCR is intended to foster the career success, intellectual development,

and community engagement of undergraduate students, building on the campus's history. The campus began as a citrus experiment station and grew into a land-grant university, co-founded by Riverside civic leaders and Indigenous historians. Growing beyond its early years as a high-quality liberal arts-oriented university, today UCR stands proudly as a renowned research university known for the diversity and achievements of its student body, and the excellence of its faculty's research. The University is recognized as an Asian American, Native American, Pacific Islander, and Hispanic Serving Institution. Our general education program reflects UCR's strengths and encourages students to fulfill their intellectual curiosity through interdisciplinary breadth in conversation and in tandem with the requirements of their major. It draws strength and inspiration from the backgrounds of its students and prepares them to take their place as thoughtful contributors to their communities, their workplaces, and beyond. Accordingly, general education should provide high-quality teaching and should be enhanced by the campus's commitment to social justice and responsibility to UCR's communities, while preparing students for successful and productive careers.

This overall guiding philosophy for general education is supported by four goals that achieve the objective of providing a relevant and impactful experience for all UCR undergraduates.

**Goal #1. To broaden and deepen students' educational experience by exposing them to subject matter, topics, and skills that complement their major**

A purpose of a general education is to provide breadth beyond a student's major and thereby contribute to students' overall development. A successful general education curriculum fosters students' engagement with subject matter, skills, and experiences that expands their understanding of the world in which they live.

General education courses should reflect topics that are of perennial interest as well as issues that are influencing society today and in the future. Courses in the former category would include the meaning of life, what it means to be human, the nature of creativity, racial conflict and injustice, how social institutions work, and love and loss. Courses in the latter category would include advances in artificial intelligence, climate change, human population growth, emerging diseases, the impact and regulation of social media, and human migrations. Teaching these courses in an interdisciplinary way will illuminate how different disciplines provide valuable perspectives on these topics. Given these goals, general education must continuously evolve so that important new topics continuously appear in the curriculum.

**Goal #2. To prepare students to critically, creatively, ethically, and effectively contribute to the changing needs of society.**

To complement students' coursework in their major, the general education plan promotes engagement with various geographic and intellectual contexts in order to illuminate how we feel, apprehend, and understand; how we solve problems; and how knowledge is produced, applied, transformed, and circulated. Our general education program addresses two interrelated goals. One is to prepare students to respond thoughtfully, ethically, and creatively to society's challenges. The other is to promote innovation and the creation of knowledge in order to facilitate and realize new possibilities.

**Goal #3. To enhance students' ability to reason, think critically, and solve problems.**

Regardless of the path students take, their future endeavors will benefit from the thinking skills they develop during their college years. Accordingly, students will acquire skills in both quantitative and qualitative reasoning. For example, they will have the ability to make inferences from data and understand how to assess the uncertainty in such inferences. They will have the ability to critically examine the assumptions in their reasoning so as to avoid faulty conclusions. Students will also develop sophisticated skills to engage with and analyze literature, art, and media.

**Goal #4. To hone students' ability to effectively express themselves and communicate with people from a variety of backgrounds.**

Our general education program affords students the sustained opportunity to communicate with cohorts in majors and from backgrounds other than their own, to expand their appreciation of different disciplines, and to bring new understandings of topics to bear on studies within their major. By doing so, the program creates intentional opportunities for students to develop their ability to communicate effectively with each other in university settings through classroom dialogue, research, artistic expression, and academic writing, while also honing their communication skills in interaction with diverse publics outside the university.

#### **IV. Structure of the R' Horizons Curriculum**

The proposed structure builds on the existing strengths of UCR's curriculum and faculty expertise, supports innovation, cultivates interdisciplinarity, teaches academic skills in a stepwise fashion, and advances this proposal's guiding pedagogical philosophy. The new general education program will require students to take eight courses across the five categories of which at least one must be an upper-division course. In addition, students will take designated courses in written composition, quantitative reasoning, ethnic studies, and perspectives for living. To fill these requirements, students may choose to take several courses focused on a unifying theme through a thematic tracks option, as discussed below.

## General Education Course Categories

The five designated categories are: A) Creativity, B) History, C) Society, D) Nature, and E) Technology:

Creativity - Creativity exists wherever insight meets expressive form. Creativity has produced beautiful product designs as much as thrilling experiences in the performing arts and innovative solutions to complex problems. Although creativity is often associated with the visual and performing arts, courses in this category teach students to apprehend, interpret, and communicate aesthetic experience and other creative endeavors wherever they are found. In this way, creativity includes experiences running from the embodied knowledge of dance and sculpture to the insight of an elegantly crafted software code. Crossing fields from arts, mathematics, and sciences, existing courses like Introduction to World Music (MUS 6/ANTH 6) and Introduction to 3-D Digital Modeling (ART 66), and more foster students' innovation and comprehension of cultural productions.

History - History refers to the study of the past, including ideas, events, people, places, cultures, and the natural world. Courses provide a wide lens through which students may view how the past remains in conversation with the present, and help students to identify continuities and contradictions across time and place. Courses like World History (HIST 10/15/20) provide contexts for understanding arts and religions as well as the rise of nation-states, the effects of different economic

systems, and the changing ways humans interact with their environments. Courses like the history of astronomy, for example, cover the earliest efforts of humans to map and understand the stars through modern discoveries of an almost limitless number of galaxies. Such a course opens students to questions like humans' place in the universe, the possibility of intelligent life elsewhere in the cosmos, and even the meaning of life on Earth. These courses provide essential background for understanding philosophical, political, and scientific thought. They also encourage critical thinking about archives and how the historical record has been created, including how social system dynamics influence the ways history has been told and by whom.

Society - The goals of Society courses are to understand social relations and social institutions, to comprehend the dimensions of societal problems, and to encourage thinking about solutions for a better world. From *Evil* (PHIL 5) to *Is There a Path to Joy?* (RLST 3), these courses theorize ethical and economic behaviors; study governmental structures and social institutions; and analyze identities, relationships, and social categories. Courses such as government policy for technological innovation and people's interactions with their environments will provide an improved understanding of the interactions and institutions behind scientific discoveries and their impacts. Students learn about textual and data interpretation and how to apply social science research methodologies to understand the social world.

Nature - These courses consider and model life forms from the molecular to the ecological scale and the properties of the inanimate world from the subatomic to the cosmic level. These courses place these domains into broader contexts that draw connections to history, society, religion, the arts, industry and innovation, and more. Courses such as Human Reproduction and Sexual Behavior (BIOL 30) or Space-Time, Relativity, and Cosmology (PHYS 7), for example, integrate scientific concepts, methods, and logic with relevant philosophical ideas, historical settings, and contemporary social issues. Other nature courses explore science-related issues of our time -- for example, the opportunities and concerns raised by climate change and the transition to renewable energy sources.

Technology - These courses highlight the tools that have expanded the powers of human beings through the application of scientific, mathematical, and engineering principles. Technology has helped shape history and society from the development of irrigation to the landing of spacecraft on Mars. It has also generated new areas of scientific research, new applications of traditional ecological knowledge, and new forms of art. These courses are intended to explore the workings and the impact of specific technologies. For example, a new course on artificial intelligence (based in part on the content of CS 9A) will show how machine learning occurs. It will describe the tasks at which machines outperform people, where they still have limits, and the far-reaching implications of artificial intelligence. While the majority of these courses will reside in the science and engineering colleges, not all will. For

example, a current general education course, Introduction to Photographic Processes (ART 3), explores historical and contemporary technologies used in image capture and the purposes to which they have been applied. Such courses ask students to understand not only how technological tools work and contribute to human progress but also the historical and cultural conditions that made technological advances possible and the problems that these advances have sometimes created.

Rather than accept separations between departments, the categories bring together different points of related knowledge and invite students to reflect on multi-dimensional ways of knowing, their own positions, and the relationships between them. Cross-disciplinary and cross-college topics should be welcomed. General education courses in humanities, arts, and social sciences could, for example, encompass topics such as human evolution, the neuroscience of personality, and the statistics of polling. Similarly, general education courses in science and engineering could include, for example, the science of science fiction, the history of pandemics, and the social and economic consequences of climate change.

All general education courses must include content that fits into at least one of the five designated categories. However, the entire course need not be devoted to a particular category. For example, many current single discipline- and skill-based courses such as Introduction to Computer Programming (CS5) and Introduction to

Psychology (PSYC 1) will fit a category, just as existing interdisciplinary courses like Earthquake Country (GEO 8) and Gender and Sustainability (GSST 21) may fit into more than one category.

At the same time, faculty are encouraged to design new courses or revise current courses to encompass a multi-faceted understanding of both perennial topics of interest and the new issues of our time. Imagine compelling new general education courses beyond singular disciplines like The Political Economy of Health, The History of Climate Change, and The Poetry of Protest. A new course called The Racial Politics of Performance: Blackface to #OscarsSoWhite would traverse Creativity, History, Society, and Technology by teaching how the history of media technology, cultural production, and critical reception have shaped racial representation. For another example, see Sustainable Product Design (ME 176), which examines the environmental impacts of technology and the design of innovative products to mitigate these impacts. Courses like these will provide exciting opportunities for faculty to invent the courses they passionately want to teach on important topics with cutting-edge thinking and that students actually want to take, leading to a more generative learning environment.

### Requirements in the Five Categories

To ensure breadth of knowledge, students are required to take four courses among the A, B, and C categories, and three courses among the D and E categories, plus

one additional upper-division course from any of the five categories. Students must, during their career at UCR, cover all five categories. Although one course may pertain to several categories, students can use a single course to fulfill only one category. General education courses with sufficient disciplinary content, such as Introduction to Computer Programming and Introduction to Psychology, can count for credit in students' majors.

To complete the category requirements, students will take one upper-division course in Creativity, History, Society, Nature, or Technology. Distinguishing UCR's curriculum and potentially making UCR's pedagogical approach a model, these upper-division general education courses are new to the curriculum, and they should spark faculty members' creativity and students' interests. This upper-division course necessarily rests upon foundational knowledge and introductory skills from earlier courses, and then makes connections between the methods and emphases of more than one discipline. Because it relies on interdisciplinary approaches and teaching at the intermediate or innovative skill level, this course is distinct from a regular elective. Moreover, it guarantees that transfer students obtain some experience with UCR's unique, boundary-crossing general education curriculum. Such courses emphasize project-based learning or community engagement specific to Riverside, such as investigating the science, history, and business of citrus or local museums like the Cheech Marin Center for Chicano Art, Culture, and Industry.

Some departments may already have courses that can fulfill this general education requirement, whereas other departments will need to develop new courses. Some upper-division courses will have prerequisites, while others will not. With faculty guidance, the scaffolded skills tracking system will help to ascertain if students are prepared to take certain courses. This requirement should not conflict with majors; majors may allow some coursework to count for both major and general education requirements, as they do now.

### Other Required Courses

The campus-wide required courses include: (A) three written communication courses, which could include designated courses in the student's major, (B) one quantitative reasoning course, (C) one ethnic studies course, and (D) one perspectives for living course. These courses also align with the goals of the curriculum's guiding philosophy. They are closely connected, in particular, with Goal #3 (enhancing students' ability to reason, think critically, and solve problems) and Goal #4 (honing students' abilities to effectively express themselves and communicate with people from a variety of backgrounds). The perspectives for living requirement will also contribute to Goal #2 (helping students to become effective contributors to the changing needs of society).

Successful and effective written communication courses will be taught in small seminars, as in the current University Writing Program; and we recommend substantive review and revision of the existing English writing courses to ensure they correspond with the updated goals of general education. In particular, courses in written communication should engage deeply with the development of students' information literacy and oral communication skills, as well as their skills in written communication. We propose to retain the current campus-wide ethnic studies requirement. Skills in quantitative reasoning are essential for understanding the issues of the day, which are often reported in statistics, graphs, and tables. The new two-unit perspectives for living requirement will teach students strategies that promote academic success, psychological and physical health, professional development, and financial literacy.

### College-Specific Courses

Colleges may decide to add other general education requirements beyond those designated here. The college-specific courses will be determined by the executive committees of each of the six undergraduate colleges.

### Summary of the Proposed Structure

In sum, the general education curriculum consists of 8 General Education Courses in five subject matter categories and 6 other required courses. We assume that the

average UCR undergraduate takes 45 courses during their four years on campus (three or four courses per term over 12 terms). The remaining 31 courses will be divided between major courses, elective courses, and any college-specific general education requirements.

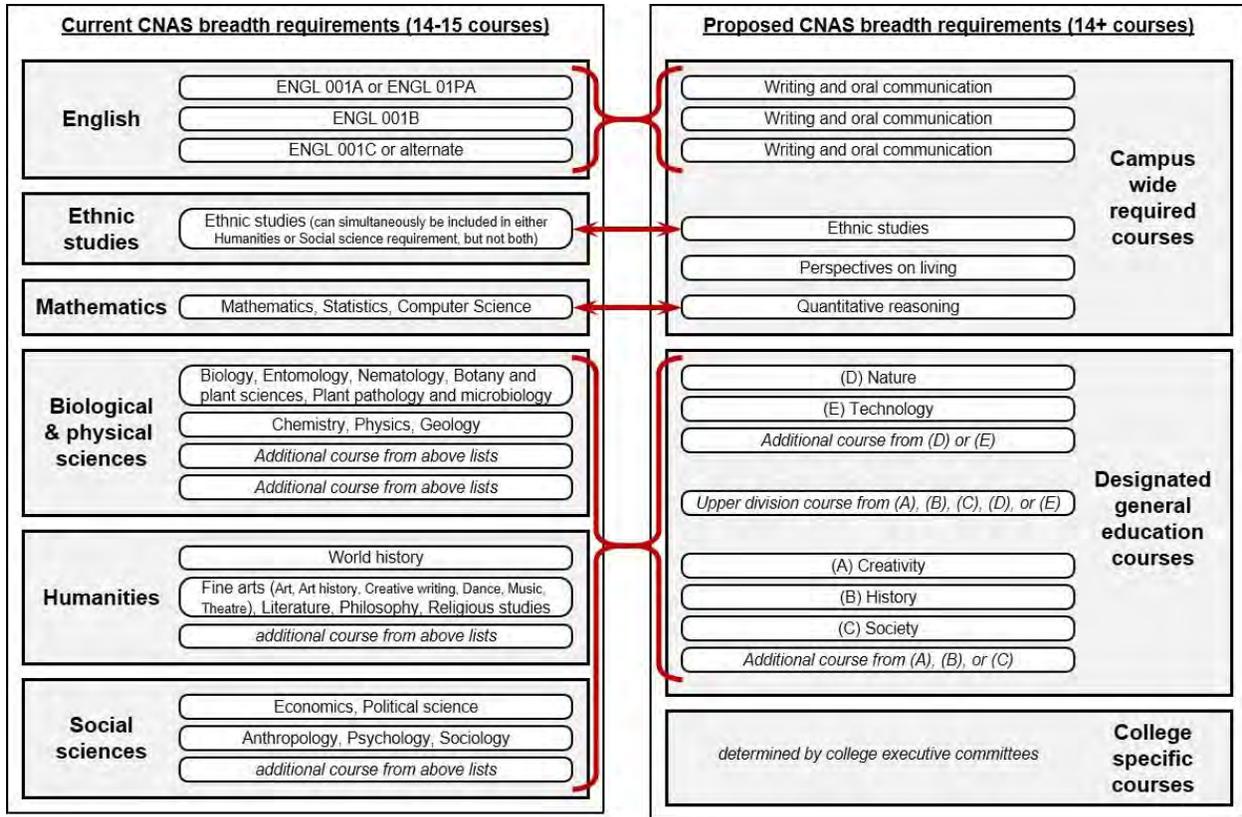
Within this structure, we realize that no single approach to general education is likely to appeal to all students. For this reason, a wide range of courses will be available to students for purposes of fulfilling general education requirements.<sup>1</sup>

Figures 1 and 2 provide a comparison of the new curriculum to the existing general education curriculum in UCR's two largest colleges, CNAS and CHASS.

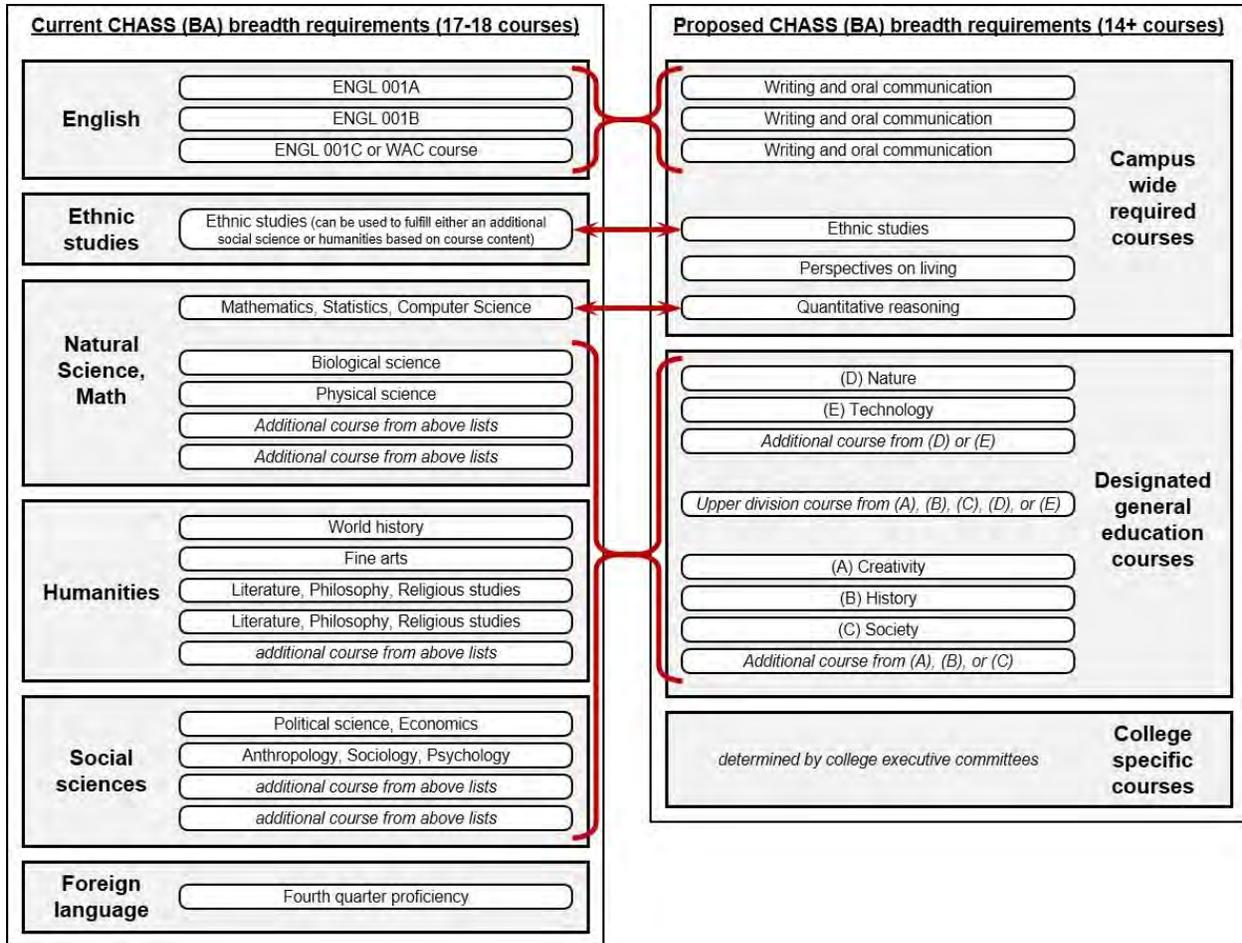
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<sup>1</sup> An alternative structure, which a few members of the committee found preferable, is provided in Supplemental Report No. 2. Supplemental Report No. 2 is an archive of documents relevant to the Committee's process. It also includes a timeline of the Committee's work and copies of the three initial proposals proposed by subgroups of Committee members. The initial proposals were circulated to campus constituencies. The Committee developed the R'Horizons proposal based on the feedback received on these three initial proposals, as well as continuing discussion by the Committee as a whole and the work of subgroups responsible for composing each section of the proposal.

**Figure 1: A comparison of the existing general education curriculum in CNAS to the proposed curriculum.**



**Figure 2: A comparison of the existing general education curriculum in CHASS (BA) to the proposed curriculum.**



Thematic Tracks Option

The new structure provides an option for faculty members to put together thematic tracks that explore a specific topic in greater depth than would be possible in any single course. For example, a group of faculty members might propose a three-course track in Technology and Society. In this example, courses could satisfy general education requirements in the Society, Nature, and Technology categories.

Other track options could explore the construction of knowledge in a particular discipline, including the frameworks that permitted the topic to become canonical, which theory it superseded, whether in different contexts/cultures alternative theories were developed, how the new theory fit within the broader cultural landscape of a time and place, and whether proponents of the dominant paradigm accepted or rejected the new theory. One could imagine, for example, a two- or three-course sequence on the intellectual history of genetics from Mendel through CRISPR, incorporating the science and technology involved in genetics as well as the field's sociological ramifications.

The thematic tracks options can include as few as three and as many as six courses. Through a framework such as this, departments might create a series of lower and upper division courses, the latter of which might require the former as prerequisites. Faculty members proposing tracks must designate the general education categories each course will satisfy. Students can opt in and out of tracks at any time. Those students who complete a track will be able to include the track completed on their transcript.

## V. Transfer Students

With the increasing ratio of transfer to first-year student populations as called for by the UC Master Plan, it is important to consider the impact of the proposed R’Horizons curriculum for transfer students at UCR. The Intersegmental General Education Transfer Curriculum (IGETC), a series of courses covering lower-division general education requirements that California community college students can complete before transferring into the UC system, provides a convenient framework for this purpose.

The typical course load at UCR required for transfer students to fulfill our current breadth requirements is a useful precedent for what might be expected under the proposed general education curriculum. Current IGETC requirements are shown in Figure 3, and students can transfer in with a full IGETC, a partial IGETC (missing no more than 2 courses from the list in Figure 1), or no IGETC (for transfers from a 4-year college or university).

### IGETC subject and unit requirement

Subject area	Required courses	Units required
<b>1. English Communication</b>	2 courses	6 semester units or 8-10 quarter units
One course in English composition and one course in critical thinking/English composition.		
<b>2. Mathematical Concepts and Quantitative Reasoning</b>	1 course	3 semester units or 4-5 quarter units
<b>3. Arts and Humanities</b>	3 courses	9 semester units or 12-15 quarter units
Three courses with at least one from the arts and one from the humanities		
<b>4. Social and Behavioral Sciences</b>	3 courses	9 semester units or 12-15 quarter units
Three courses from at least two disciplines, or an interdisciplinary sequence		
<b>5. Physical and Biological Sciences</b>	2 courses	7-9 semester units or 9-12 quarter units
One physical science course and one biological science or course, at least one of which includes a laboratory		
<b>6. Language Other than English *</b>	Proficiency	Proficiency
Proficiency equivalent to two years of high school courses in the same language.		
<b>Total:</b>	11 courses*	34 semester units

Figure 3: current IGETC subject and unit requirements.<sup>2</sup>

Students with a full IGETC will be given credit as having completed all their lower-division breadth requirements, even in the absence of perfect articulation between their community college coursework with the breadth requirements of their UCR college. The only remaining requirements would be to take the required upper-division general education course and a perspectives for living course. For transfer students who arrive at UCR with partial IGETC, colleges would add to the student's requirements much the same way they do now to fill courses that are missing. The Committee proposes that students in this category be required to take, in addition, the required upper-division course and a perspectives for living course. The transcripts for students with no IGETC must be examined carefully in order to identify the courses that articulate with the breadth requirements of their UCR college.

## **VI. Skill Development**

Students come to UCR with a number of skills and abilities developed through their K-12 education; their economic, cultural, familial, and employment environments; and their peer interactions. UCR's general education should engage students in continued development of these existing skills and should introduce and support the development of new skills. The R'Horizons curriculum includes the incorporation of skill development activities in core competencies that all UCR undergraduates will

develop through an intentional coordination between the general education curriculum and the student's major curriculum.

The skill development features of the curriculum are drawn from the Western Association of Schools and Colleges (WASC) core competencies and include written and non-written communication, quantitative literacy, information literacy, and critical thinking. UCR students should also develop relevant technical and computational proficiencies, which have the added benefit of providing students with employable skills. Upon graduation, all UCR students should be equipped to utilize their developed capacities in core areas to be compassionate and engaged members of their local and global communities, who are qualified and effective employees or graduate students, with a desire for life-long learning and a drive for innovating solutions to critical global and local problems.

### Stepwise Skill Development

The development of competencies should be integrated throughout the curriculum, meaning through general education courses, major-specific courses, and other educational experiences (e.g., mentored research, capstone or thesis project, service learning, and internships). The development of each competency should intentionally build in a stepwise fashion from basic introduction to skills to expertise in those skills that involve students as collaborators in the creation of novel scholarly and/or artistic output.

For effective stepwise skill development, each student should have three levels of direct instruction with each skill. Instruction will slowly remove direct support from students so that they can utilize these skills and competencies outside of the classroom. These experiences can operate in tandem (e.g., students gain critical reasoning skills and information literacy as they learn to write or present) and can be coordinated across campus units and departments (e.g., an introductory writing course provided by the campus), followed by an intermediate writing exposure in a general education course, and an opportunity for students to contribute novel scholarly or artistic work in an upper-division course in their major or through an independent thesis project.

Every course a student takes would be expected to support the development of at least one skill at one level. In introductory level work, students develop basic, foundational skills, knowledge, and vocabulary necessary for becoming innovators of knowledge and art. In intermediate level work, students utilize core competencies to critically evaluate and synthesize existing knowledge, art, and scholarly methods. In innovation level work, students collaborate in mentored scholarly activities in the creation and sharing of new knowledge or artistic expression. For step-wise skill development to be effective, educational experiences operating as an opportunity for the development of a specific skill and level should have some degree of consistency in assignments/activities so that instructors of later courses can safely assume

students have achieved the previous level of expected proficiency in the earlier courses.

### Embedding Stepwise Skill Development in Campus Infrastructure

A recommended approach to stepwise skill development is to code every course in the campus course management system for the core skills (and levels of those skills) it addresses. Almost every course on campus already includes activities and assignments targeted at helping students to develop these skills. As such, this model does not require the development of entirely new courses or course sequences. However, the course registration and degree tracking systems on campus will need to be updated in order to ensure all students have the opportunity to develop skills at each level for each of the five core competencies. Students will not be required to take courses at all three skill levels for each of the core competencies in order to graduate. The expectation is that all students will be encouraged to do so. No student should have trouble doing so within the existing unit requirements at UCR, as long as the courses themselves intentionally support the development of those skills. In other words, initial change will occur with the addition of one or several skills-based activities/assignments in courses as instructors purposefully update any given course to support students' skill development.

## Regular Assessments of Impact

UCR will need to regularly assess the impact of course innovations and student tracking on faculty and staff, as well as if skill development is happening in courses and if students are achieving the expected level of each skill as they progress through their education at UCR.

- 1) *Consistency in coding courses.* To ensure that any given course incorporates the skill development for which it is coded, when instructors submit their skills code to department and campus administrators, they will be required to indicate what specific activity or assignment in their course supports which skill at which level. The Academic Senate's General Education Committee will facilitate and review the initial coding of courses. The workload will be heavier in the first few years of implementation. Additionally, as programs undergo review (through the Committee on Educational Policy), one requirement may be the submission (and review) of course syllabi to ensure the courses still meet the initial skills goals/codes.
  
- 2) *Adoption of shared rubrics.* To ensure a degree of consistency in skills learning goals (not content or activities, which are at the discretion of the instructor), the campus may choose to adopt shared skills rubrics that will be utilized in courses. In Supplemental Report No. 3., we provide recommendations for shared rubrics for each of the five core competencies. One potential use of

these rubrics is in the scoring of some subset of student work. In other words, in addition to the grading of written work that is typically used in a course, each written product could also be scored according to the campus rubric. These rubric scores could be housed centrally (e.g., in the Teaching and Learning Center and/or in the Office of Evaluation and Assessment), and accessible for departmental and campus learning outcomes assessments, as well as for tracking of student skill development.

3) *Identifying and intervening.* Step-wise skill development works best if students move through each level in the intended order. However, it is possible that students (a) will never move past an introductory level for any given skill, or (b) have skills experiences out of sequence (e.g., take an innovation-level course before they have taken a course at the intermediate level). One benefit of a centralized repository for the individual rubrics for each student would be the potential for each student to have a dashboard that tracks their skill development. Offices on campus (e.g., the Academic Resource Center) may opt to hire additional staff to identify students who may benefit from targeted intervention (e.g., an upper-division student who is still writing at the introductory level may benefit from extra support). Additionally, this kind of tracking will help the campus make future decisions about fully-implemented stepwise design (e.g., a student must have an intermediate- level

exposure before or as a prerequisite for registering for an innovation- level exposure).

4) *Training.* We anticipate much of the skills-based training will occur through the smaller discussion sections and labs attached to larger courses. The success of any concerted effort will require investment in support for faculty to make course changes and innovations and in the training of graduate student TAs and instructors in best-practices for scaffolding students (e.g., through discussion and in responding to written work).

#### Stepwise Rubrics for Skill Domains

In order to develop a clearly-articulated set of goals for students at each level within each competency, we began with a review of the American Association of Colleges & Universities VALUE rubrics. We then solicited feedback and perspectives from relevant on-campus experts for specific competencies. We created a tiered set of competency goals within each domain for each of the five skill areas. The full committee reviewed and discussed these competencies. We then revised the rubrics based on feedback from the committee. We anticipate that the rubrics will continue to evolve under the guidance of the Academic Senate standing committee on general education.

## **VII. Scheduling and Availability of Courses**

One of the most frequent concerns raised by students we surveyed had to do with the scheduling and availability of general education courses. Advisors also expressed similar concerns. Students indicated that not enough general education courses were offered every term and this was particularly true for popular general education courses. It is essential that both the number and type of general education courses be closely coordinated across the campus in the future.

This is not a new problem that will be created by the adoption of the new general education curriculum. It is an existing problem that needs to be addressed within the context of a changing mix of general education courses. Because we anticipate that many existing courses will be approved and integrated into the new general education curriculum and entirely new courses will be phased in over a five-year period (see Section IX below), scheduling and availability issues will focus primarily on existing general education courses during the first years of the phase-in period.

The committee has made the following calculations based on an estimate of 12,000 students taking 4.5 general education courses per year. These estimates assume that upper-division students will have largely finished their general education curriculum and that lower-division students will be taking, on average, one course in their majors and one elective course per term on average. We assume that the

remaining 1.5 courses will be in the Written and Oral Communication (WOC) sequence.

The current English Composition courses are capped at 25 students and enrollments will consequently need to be calculated separately. We assume that these guidelines will continue under the new WOC courses. Assuming that some students continue to test out of the WOC courses, we can calculate that 10,000 lower-division students will take 1.5 WOC courses/year, for a requirement of approximately 600 WOC courses/year, or 200/term.

The remaining general education classes will be distributed among the five designated general education categories and the three other required courses. One approach to distribution would require an equal number in each of the eight categories. This calculation leads to an estimate of the total number of courses in each category per year and per term as indicated in Table 1.

**Table 1: Scheduling Estimates for General Education Courses**

<b>Average Class Size per Course</b>	<b>Total Classes/Year Required in Each of 8 GE Categories</b>	<b>Total Classes/Term Required in Each of 8 GE Categories</b>
75 students	90	30
100 students	68	23
125 students	54	18
150 students	45	15
200 students	34	11

Clearly the class scheduling requirements are formidable if courses average only 75 students per term and they become more realistic as the average number of students increases.

An alternative approach would be to expect that the courses on ethnic studies, quantitative reasoning, and perspectives on living enroll a larger number of students, while the courses in the five designated categories vary in class size. We do not attempt to give estimates under this alternative scenario.

We anticipate that the Registrar, the academic advisors, and the members of the General Education Committee will be in regular contact to ensure that a sufficient number of classes are offered each term in every one of the course categories and that popular courses are offered more frequently. This will be an important feature of the work of the new General Education Committee, together with reviewing new course proposals and monitoring the effectiveness of approved courses.

### **VIII. Course Approval and Faculty Incentives**

All courses seeking designation as fulfilling general education requirements will be expected to complete the course proposal form. Many existing general education courses will be eligible for inclusion in the new curriculum with minimal or no modification. We provide a draft of the course proposal form in Appendix B, and a draft of a rubric for evaluating course proposals in Appendix C.

The campus recognizes that the development of new courses is time consuming. This is especially true for courses that must meet a variety of goals, including specification of learning outcomes, skill development activities and their assessment, and, in many cases, the incorporation of interdisciplinary perspectives. For some instructors, it could mean a completely different way of looking at their own discipline. At the same time, it is important to emphasize that no course will be expected to meet every objective of the new curriculum. The minimal threshold is to present a course of wide interest to undergraduates and one that includes skill development activities at designated levels.

We anticipate the appointment of a new Academic Senate standing committee to review, approve, and monitor the success of general education courses. The campus should recognize that service on the proposed general education review committee will be time consuming during the first several years of program administration. Because of the time commitments entailed, the campus should be prepared to provide incentives for faculty participation, at the discretion of department chairs, and appropriate to faculty teaching loads, as follows:

- 1) *Course creation.* Depending on how much time it will take to design or modify a course, faculty who develop general education courses could negotiate for

course reduction, service reduction, or research stipend equivalent. Credit for course creation will vary by department, and will depend on discretionary funds available. Consideration could be given to allow a faculty member to teach a particular course (or set of courses) for several years consecutively. Care should be taken to offer incentives in proportion to the time that will be needed.

Within some departments, there may be faculty who may be especially suited to, and excited by the prospect of, bringing highly successful general education courses to fruition. We recommend that incentives provided by departments be those that would appeal to such faculty. Ideally, co-teaching would be an option for faculty to complement and collaborate with one another, providing a potentially richer education for their students.

2) *Course instruction and departmental teaching loads.* It is not anticipated that offering general education courses should increase departmental teaching loads, but perhaps only redistribute them. Teaching in the summer session may be a useful option due to additional salary and the ability to phase in a course to a smaller class.

3) *Membership on the general education review committee.* As we propose this committee become a standing committee of the Academic Senate, membership on the committee would count towards the service component of a faculty member's file.

A major determinant of faculty participation is whether the department or program chair and faculty view the general education mission as an important one. We encourage programs to find ways of blending general education goals into their program-level learning outcomes and goals, so that the general education mission is integrated into degrees, as opposed to being a separate requirement.

### **IX. Implementation Timeline**

A phasing in of a revised general education curriculum will necessarily take place over multiple years. It is important that departments develop short- and long-term goals with a multi-year plan to phase in the new general education curriculum and requirements.

The implementation timeline should be spread over at least 5 years. This will allow a reasonable time frame to build out the new general education curriculum through revision of existing courses and approval of new courses. It will reduce the burden on the registrar and the information technology staff to create infrastructure and

course coding. It will also reduce the burden on faculty and staff to track the impact of the scaffolding framework on student outcomes and time to degree. During this period, one early step will be to develop the information technology infrastructure for course coding prior to the terms in which the courses are offered. We anticipate that this coding could begin with courses offered in Spring 2022.

## Appendix A: UC and UCR Values

### *The University of California's Mission Statement*

"The distinctive mission of the University is to serve society as a center of higher learning, providing long-term societal benefits through transmitting advanced knowledge, discovering new knowledge, and functioning as an active working repository of organized knowledge. That obligation, more specifically, includes undergraduate education, graduate and professional education, research, and other kinds of public service, which are shaped and bounded by the central pervasive mission of discovering and advancing knowledge."

— Mission statement from the University of California Academic Plan, 1974-1978

### *UC Riverside's Mission Statement*

The University of California, Riverside will transform the lives of the diverse people of California, the nation, and the world through the discovery, communication, translation, application, and preservation of knowledge – thereby enriching the state's economic, social, cultural, and environmental future.

### *UC Riverside's Undergraduate Education: Vision, Mission, and Values*

#### Vision Statement

To empower undergraduate students to become leaders, engaged global citizens, and lifelong learners.

## Mission

Undergraduate Education cultivates student success by providing academic support, experiential learning, and research opportunities. Through collaboration with our students, campus, and community, we remain at the forefront of innovation and creativity to enable students to reach their highest potential.

## Values

As team members in Undergraduate Education, we value student success by practicing:

- **Diversity** through our inclusion of individuals and ideas;
- **Innovation** through our programs, uses of technology, and methodologies;
- **Respect** for students, colleagues, and community partners;
- **Ethical conduct** and accountability;
- **Collaboration** with internal and external stakeholders; and
- **Transparency** of our intent, conduct, and communication.

## Appendix B: Proposal Template for General Education Courses

1. Instructor(s): \_\_\_\_\_

2. Department(s): \_\_\_\_\_

3. Title of Course:

\_\_\_\_\_

4. Is this an existing or new course? \_\_\_\_\_

5. Core areas covered by course (check all that apply):

a. Creativity \_\_\_\_\_

b. History \_\_\_\_\_

c. Society \_\_\_\_\_

d. Nature \_\_\_\_\_

e. Technology \_\_\_\_\_

6. How does your course prepare undergraduates to contribute to the changing needs of contemporary society? ( $\leq$  300 words)

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

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7. Discuss the ways in which your course will broaden and deepen students' educational experience beyond their major ( $\leq 300$  words):

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8. Discuss how your course will enhance students' ability to reason, think critically, and solve problems ( $\leq 300$  words)

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9. How will your course hone students' ability to express themselves and communicate, preparing them to participate effectively in a complex and changing society? ( $\leq 300$  words)

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10. List the major learning outcomes of your course, how you will organize material to meet them, and how you will assess the outcomes ( $\leq$  300 words)

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11. Please describe any innovative teaching and assessment methods that you plan to use (no more than 250 words)

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12. Please attach a syllabus for your course.

**Appendix C: Proposed General Education Course Approval Rubric**

Course Number:

Course Title:

Instructor(s):

Department / College:

Proposed Start (Term/Year):

Existing GE Course (Yes/No):

Course Proposal Evaluation Committee Members:

Criteria	Yes/No	Comments
<p><b>1</b> excites student interest by addressing topics of general interest and encourages student participation</p>		<p><i>Provide comments/feedback here</i></p>
<p><b>2</b> prepares students to critically, creatively, thoughtfully, effectively, and ethically contribute to the changing needs of contemporary society</p>		<p><i>Provide comments/feedback here</i></p>

3	broadens and deepens students' educational experience beyond their major and exposes them to subject matter, topics and skills that complement their major		<i>Provide comments/feedback here</i>
4	enhances students' ability to reason, think critically, and solve problems		<i>Provide comments/feedback here</i>
5	hones students' ability to effectively express themselves and communicate with people from a variety of backgrounds		<i>Provide comments/feedback here</i>
6	includes learning objectives and methods to achieve these learning objectives.		<i>Provide comments/feedback here</i>
7	includes development in at least three core competencies and addresses how students will be assessed in each core competency		<i>Provide comments/feedback here</i>
8	includes methods on how instructors will assess students' progress in the core competencies.		<i>Provide comments/feedback here</i>
9	is (will be) cross-disciplinary and/or team taught		<i>Provide comments/feedback here</i>

10	<p>syllabus shows a commitment to the Guiding Philosophy for General Education at UC Riverside; includes learning objectives, assessment methods, and required statements regarding ADA, academic integrity, etc.</p>		<p><i>Provide comments/feedback here</i></p>
11	<p>is (or will be) offered at least once a year</p>		
	<p><b>Recommendation:</b></p>		<p><i>Provide comments/feedback here</i></p>
	<p><b>Recommend Approval of Proposed GE Course</b></p>		<p><i>Provide comments/feedback here</i></p>
	<p><b>Recommend Further Clarification in the Following Area(s):</b></p>		<p><i>Provide comments/feedback here</i></p>

# **Supplemental Report No. 1: Full Report on the Evidence of the Need to Improve General Education at UCR**

## I. Introduction

The current breadth requirements represent a valuable approach to general education. Their strengths include great flexibility for students to choose courses in which they are interested; the opportunity to learn about fields in which they may wish to major in should their current majors prove unsatisfying; and sufficient breadth to meet the traditional objective of general education to enrich students' college education by broadening their understanding of the cultural, social, and natural worlds. In addition, many of the courses offered through general education are thoughtfully designed and include material that sets the particular subject matter within a broader framework. For example, general education courses in the Department of Earth and Planetary Sciences consistently work to demonstrate that the processes that govern the Earth's surface can be understood in a logical and scientific manner while drawing out the connections between the science and the philosophical, societal, and political implications associated with the Earth processes in question. Similar statements can be made about many general education courses offered in other departments. Moreover, the current system allows for a maximum of faculty engagement in improving general education courses.

Why, then, do we propose a significant revision of the general education curriculum?

One reason is that any curriculum that has remained virtually unchanged for four decades should be considered in need of an update. Every undergraduate and graduate program on campus is expected to be reviewed on a seven-year cycle. General education has been the exception. It would seem very unlikely that a curriculum designed so long ago would be well suited to the interests of undergraduate students and UCR faculty today and in the future.

But this is not the most important reason for proposing a revision. The most important reason stems from the evidence we have collected on the effectiveness of the current general education curriculum. Taken as a whole, this evidence indicates not only that improvement is possible and desirable, but also points in directions that improvement can take.

## II. Evidence on the Need to Improve General Education

The General Education Review Committee collected data from ((1) a committee-designed survey of UCR undergraduate students, (2) focus groups with advisors, (3) panel discussions with alumni, (4) analysis of the SERU/UCUES surveys, and (5) analysis of a national surveys of employers conducted by the American Association of Colleges & Universities (AAC&U).<sup>1</sup> The last two of these data sources are of limited value because they do not differentiate between general education and courses in the major. However, they do point to strengths and weaknesses of course work typically taken in general education courses, and we therefore discuss them briefly.

Taken as a whole, the evidence indicates that several areas in UCR's general education curriculum are in need of improvement. Students do not see general education as having high value for their educations, as introducing them to big issues that will affect their futures, as providing multidisciplinary perspectives on topics of interest, or as helping them prepare for their future careers. The foreign language courses come in for frequent criticism. Many students also reported that general education courses failed to improve their oral communication skills, a prominent theme also in the alumni panels and the national surveys of employers. Concerns about the scheduling of courses were frequent in both the student survey and in our discussions with college advisors. Only a few general education courses are very popular with students. These include: Biology 20 (the Dynamic Genome), Biology 30 (Human Reproductive Behavior), History 20W (Writing-Intensive World History of the 20<sup>th</sup> Century), Philosophy 5 (Evil), Psychology 2 (Social Psychology), Religious Studies 12 (Religious Myths and Rituals), Statistics 40 (Elements of Statistics), and Theater 50 (Public Speaking), as well as many Dance classes. These popular courses fill quickly, leaving many students disappointed. Advisors also indicated that students have difficulties enrolling in required ethnic studies and foreign language classes for lack of offerings and/or space. Advisors and alumni frequently suggested that students be required to take a course on life skills and career development, with an emphasis on handling stress, time management, fiscal literacy, and norms of professional interaction.

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<sup>1</sup> We had hoped to find evidence also from the most recent reports to our regional accreditor, the Western Association of Schools and Colleges (WASC). WASC does require assessments of general education. However, the campus has not provided extensive assessments in this area. A well-designed 2009 pre- and post-exposure to English composition courses showed moderate improvements along several dimensions associated with effective writing following the completion of the three-course writing sequence. The most recent (2018) report to WASC included a report on students' subjective impressions of their learning gains in several skills areas. These data do not directly address general education courses or critically examine the validity of subjective learning gains scores. Educational researchers have found that students' subjective assessments of their learning gains do not correlate well with more objective measures of learning gains.

## The 2020 Survey of UCR Undergraduates

The most valuable evidence we collected comes from UCR undergraduates' experiences of general education. The survey was fielded in mid-October 2020 and concluded at the end of November 2020. In addition to the initial letter of solicitation from Senate Chair Jason Stajich, we sent students two follow-ups, also signed by Chair Stajich. Altogether 2,290 UCR undergraduates filled out the survey (i.e. approximately 10 percent of the undergraduate student body). The survey included several questions that asked students to compare their learning experiences in general education courses relative to courses in their majors. It also included questions that were explicitly concerned only with general education courses.

As Table 1 indicates, in the questions asked both about general education and major courses, responding students consistently evaluated their general education courses as less successful than the courses in their majors. The scoring for this question ran from +2 (strongly agree) to -2 (strongly disagree). The differences in scores for each of the 10 questions was statistically significant at  $p < .05$ . Table 1 excludes first-year respondents.

**Table 1: UCR Undergraduate Student Responses to Questions Comparing General Education and Major Courses**

	<b>Major</b>	<b>Breadth (GE)</b>	<b>Diff</b>
The courses help me to be successful in my future career.	1.18	0.36	0.83
The courses take on the big issues of the future that I will be facing after I graduate	0.94	0.23	0.70
I was able to work on projects that really interested me.	0.75	0.06	0.69
It led to a new appreciation for the research work of professors.	1.03	0.45	0.58
The courses have helped with my personal development.	1.04	0.62	0.42
I took courses that I found interesting.	1.13	0.76	0.37
The courses tend to be very well designed	0.89	0.56	0.33
The professors tend to be excellent.	0.90	0.64	0.27
I took courses that engaged topics from multiple disciplinary perspectives.	0.92	0.77	0.15
It provides the flexibility to take courses that interest me.	0.81	0.65	0.15

Students did not assess their general education courses as helping to prepare them for their future careers, as addressing the big issues of the future that they will be facing, or offering project-based learning to stimulate their interest and improve

their skills. The comparatively weak performance of general education courses in the area of addressing big issues of the future is particularly problematic in so far as one of the traditional goals for general education courses is that they will address precisely these kinds of issues. Similarly, one of the traditional goals of general education is to approach topics from multiple disciplinary perspectives, and here too general education courses are evaluated as significantly less successful than courses in students' majors, a surprising result. In addition, students' assessments of the design and teaching of general education courses typically fall below the level of courses in the major.

We also asked 20 questions specifically about general education courses. The responses to these questions provide evidence on qualities of general education courses and specific requirements that are evaluated more positively and more negatively by responding students. Again the scoring ranged from +2 (strongly agree) to -2 (strongly disagree) and again the table excludes first-year students.

**Table 2: UCR Undergraduate Student Responses to Questions Explicitly about General Education Courses**

It exposes me to a wide range of academic disciplines.	1.02
It helped me to critique existing social structures and institutions.	0.90
It prepared me to talk about a wider range of subject areas.	0.89
I found the social science courses valuable.	0.81
I found the humanities courses valuable.	0.78
The courses have led to improvements in my understanding of valid and invalid information.	0.76
I found the natural sciences courses valuable.	0.72
I found the mathematics/statistics/computer science courses valuable.	0.70
I found the ethnicity requirement valuable.	0.69
The courses led to improvements in my writing abilities.	0.65
I found the English composition courses valuable.	0.65
It includes many courses on important issues of the day.	0.64
The courses led to improvements in my analytical abilities.	0.64
The courses led to improvements in my quantitative reasoning abilities.	0.60
The course have led to improvements in my oral communications abilities.	0.44
I found the arts courses valuable.	0.37
I found the foreign languages courses valuable.	0.37
I found the world history courses valuable.	0.24
General education has been one of the most important features of my educational experience at UCR.	0.09

Through general education, I discovered the area in which I wanted to major.		-0.15
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The social sciences, humanities, and natural sciences courses were evaluated most positively. Only slightly below mathematics, ethnicity, and English composition courses were also evaluated relatively positively as compared to world history, arts, and foreign language courses.<sup>2</sup> Student open-ended comments about foreign language courses were frequently negative. Among the skill areas evaluated, oral communication skills fell at a level significant below the others, again suggesting substantial room for improvement. Most concerning is the very low level of satisfaction students indicated on the question asking whether general education has been one of the most important features of their UCR education.<sup>3</sup>

Cross-tabulations by college indicate that engineering students were most critical of general education, consistent with the research literature indicating that the demanding program requirements in engineering lead to impatience with general education coursework. Business students were also critical of many facets of general education, though slightly less so than engineering students. CHASS students were less critical overall, but more critical of the design and teaching of general education courses. CNAS students too raised criticisms of the current general education curriculum, including their relevance to career preparation, their connection to major issues of the future, and their limited use of project-based learning.

The open-ended comments from students provided additional evidence about problems with the current general education offerings. Five hundred and eighty-five students provided open-ended comments. The largest plurality of these students pointed to the difficulties in finding general education courses they wanted or needed; nearly one out of four comments concerned these course offerings and scheduling issues. Students indicated that popular courses filled up very fast and were not offered in sufficient volume. Some required courses were also difficult for students to schedule. In addition, many students also advocated a reduction of the number of general education courses and a surprisingly large number who commented (nearly one-fifth) said they thought that general education courses added little or no value to their educations. The foreign language requirement came

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<sup>2</sup> It is important to exercise caution in interpreting these latter statistics because not all students take world history or arts courses, and we cannot be sure that students who did not take these courses avoided filling out these questions.

<sup>3</sup> Histograms indicated that majors showed a right skew (more positive) relative to general education courses on questions regarding success in taking on big issues of the future, contributing to personal development, including projects that really interested students, and being relevant to career preparation. Responses on general education courses were more evenly distributed across the response categories. The first two of these topics are traditionally thought to be features of general education courses to a greater degree than courses in the major.

in for particular criticism in the open-ended comments. Many students said it should be dropped or reduced to no more than three required courses.

### Focus Groups with College Advisors

In early December 2020, the Committee held five focus groups with college advisors (two with CHASS advisors and one each with BCoE, BUS/SPP, and CNAS advisors), interviewing 19 advisors in all.

The Committee asked questions about the general education courses students found most and least valuable, the main issues students discussed with respect to general education, the academic skills that students were not developing sufficiently through general education, and whether a life skills course would be valuable.

As we discovered first through the student survey responses, according to advisors, students do not look for content as much as for courses that fit into their schedules. Many are worried about the effects of general education courses on their grade point averages and how this might affect their opportunities to attend graduate school (or, in the case of pre-business students, their admission to the major). Only a few courses stand out in students' minds as outstanding (see the discussion above in the section on student survey results), and these courses are popular mainly because of the excellence of instructors rather than because of the course content. Many students would like to see more general education courses that articulate with their majors.

Some students are dissatisfied with general education courses because of their difficulty or because they are hard to schedule. Many students look for "easy" courses that will not negatively affect their GPAs. BCoE advisors said their students look for courses that will count double or triple for requirements. According to the advisors, most other student complaints have to do with scheduling. Some required and popular courses are in short supply. Among CHASS students, the most impacted courses are those in Anthropology, Ethnic Studies, Philosophy, Psychology, Religious Studies, and Sociology. CNAS and BCoE students sometimes also mention arts courses that they would like to take but cannot do to limited space availability, as well as the required courses in English composition, ethnicity, and world history. In addition, many students, according to advisors, complain about the foreign language courses, wondering whether they are necessary and whether the exam fees associated testing out of classes should be required.

Responses varied to some degree by College. According to advisors, many CHASS majors express anxiety about mathematics courses, while CNAS and BCoE majors express anxiety about courses with substantial writing requirements and want to avoid them. Students in CNAS sometimes consider the ethnicity courses

unnecessary, while students in other colleges tend to find it valuable, though not offered often enough.

Traditional understandings of the value of general education courses – that they will expand students’ understanding of the world or help them to become better thinkers with broader interests – do not tend to resonate with most UCR students. Instead, general education is seen by students through a “check box” mentality, as courses that are necessary to get a degree, and not much more than that. Advisors emphasized that general education instructors should explain and frame the philosophy of general education in every course so that more students will move away from the “check box” mentality. In addition, instructors should help students see that higher education is not only about the immediate monetary cost and value of a course and instead help them to think about how engagement in course content can strengthen their abilities to pursue meaningful and remunerative careers and to make change in the world.

Advisors worried that students had too few experiences in general education to aid their analytical and critical thinking abilities and their oral communication skills. Most advisors felt that a life skills course emphasizing topics like stress management, professional conduct, and financial literacy would be valuable for students. However, many advisors thought these skills were being taught already in the Colleges and in Student Affairs through learning communities and workshops.

### Panel Discussions with Alumni

In November and December 2020, the Committee held five panel discussions with UCR alumni. Altogether, 20 alumni participated in these panel discussions. These sessions included a mix between older and younger alumni, but included more alumni who were working in business, engineering, and related fields than those working in fields more closely associated with the arts, humanities, and social sciences.

Perhaps because of the composition of the panels, alumni found courses in statistics to have been among the most valuable to their careers. Many work with data and relied on concepts and techniques they learned in statistics.

The views of the alumni otherwise largely paralleled those found on the student survey and in our conversations with advisors. Foreign languages were the courses most often criticized as problematic. Few felt that they remembered much from these courses. Some found world history to be very important for the perspective it provided, while others found it overly broad, redundant with what they had learned in high school, and in some cases not well taught. The ethnic studies requirement

yielded similarly mixed views, with most saying that it was essential for understanding American society and building a sense of agency in students from under-represented communities, while others (including some alumni from under-represented communities) thought it was unnecessary or of limited value.

The alumni cited oral communications as the single most important skill that they found missing in their own general education experiences. Several others mentioned that courses did not provide enough challenge in terms of analytical and critical thinking. Some alumni mentioned the need to learn “soft skills” to complement academic skills. For the alumni, these “soft skills” included teamwork, negotiating differences between colleagues, working with people from less progressive political backgrounds, and professional norms of interaction. This theme came through as well in the frequent mention by alumni panelists of the desirability of a life skills course to complement academic skill building courses. Among the topics most often emphasized were financial literacy and time management.

We asked alumni to rate the relative importance of five aspects of general education courses: (1) taking on big issues of the future, (2) examining topics from a multi-disciplinary perspective, (3) an emphasis on academic skills, (4) a basic introduction to academic discipline’s outside the major, and (5) incentivizing the best teachers on campus to teach general education courses. Examining topics from a multi-disciplinary perspective and taking big issues of the future received the highest ratings, followed by incentivizing the best teachers. Exposure to academic disciplines outside the major received few highly positive mentions and indeed several alumni thought general education courses should be better aligned with majors, a theme that came through also in the student survey responses.

Several alumni suggested that UCR students were distinctive relative to students at other campuses in their commitments to diversity. Most found this to be an important and valuable feature of a UCR education. Others raised questions with this interpretation, and two suggested that this commitment came at the expense of a competitive academic environment, which tended to hamper students who were seeking to be successful in more challenging graduate programs and workplaces.

### SERU/UCUES Surveys

UCR participates in a biannual survey of college student experiences as a member of the SERU/UCUES Consortium. The Committee compared the responses of UCR students on the 2018 survey to those of students at other UC campuses as well as to those of students at other participating institutions, all of which are major public

research universities. We focused on questions in the academic engagement module of the survey.

As noted above, the results are of limited value for the purposes of a redesign of the general education curriculum. First, the surveys do not distinguish experiences in general education, major, and elective courses, making a clear connection to general education courses impossible. Second, the UCR response rate was, by some measure, the lowest among the UC campuses. Indeed, response rates on several campuses were double those at UCR. Previous research suggests that more conscientious students tend to fill out these surveys more often than less conscientious students.

UCR respondents compared favorably to respondents from four sister campuses on most classroom participation items – for example, asking questions in class, bringing up issues discussed in other classes, and making presentations. They compared less favorably relative to other UC campuses on choosing challenging classes and on the amount of time they reported spending on study outside of class. UCR respondents compared favorably to respondents from non-UC campuses on the following items: doing more work than required because of interest in the class, revising papers to improve their quality, and taking research-oriented seminars.

By contrast, UCR students compared unfavorably to students from non-UC campuses on the classroom participation questions, on choosing challenging courses, and in taking courses in which professors knew their names. Like students at other UC campuses, they compared unfavorably also on the amount of time they reported spending on study outside of class and on reporting that they do a high proportion of the assigned reading for their classes.

### AAC&U Surveys of Employers

Our final piece of evidence supports the notion that general education can better prepare students for social mobility opportunities. It comes from the two most recent surveys of employers conducted by American Association of Colleges & Universities (AAC&U), the first in 2013 and the most recent in 2018. These surveys examined the learning outcomes that executives and hiring managers believe are most important for success and how well prepared recent college graduates are in these areas. Although the surveys do not separate learning in majors from learning in general education courses, they nevertheless provide valuable information on where the weak points in college skill development exist, according to a sample of people whose assessments matter for students' life chances.

In each of the two survey years AAC&U surveyed approximately 500 business executives and 500 hiring managers at companies whose work force consists of at

least 25% who hold associate or baccalaureate degrees. These employers were located mainly in the private sector (approximately 85%) and are evenly distributed across the United States.

In 2018 higher proportions of both executives and hiring managers said that recent graduates have the skills to succeed in entry-level positions (approximately 60%) than said they had the skills needed to advance or be promoted (approximately 30%). The proportion of executives who said that college graduates had the skills needed to succeed in entry-level positions declined between the two survey years. Executives and hiring managers in the West were least happy with the outcomes of college.

Among the college learning outcomes examined in 2018, both executives and hiring managers placed the highest importance on the ability (1) to communicate orally. In addition, both executives and hiring managers rated (2) critical thinking, (3) ethical judgment, (4) working effectively in teams, (5) working independently, (6) self-motivation, (7) written communication, and (8) real-world application of skills and knowledge as important skills for workplace success (each scoring on average above 8 on a 10-point scale).

Both survey groups indicated large gaps between how well prepared college students were in the following areas as compared to their importance for workplace success: critical thinking/analytical reasoning (44-point gap); ability to apply knowledge in the real world (43-point gap); ability to communicate effectively in writing (43-point gap); self-motivation (42-point gap); oral communication (41-point gap) and ability to act independently (39-point gap).

A comparison of the two survey years showed notable increases in the level of importance both executives and hiring managers placed on recent graduates' ability to analyze and solve problems with people from different backgrounds (a 9-point increase) and their ability to locate, organize, and evaluate information from multiple sources (a 5-point increase).

Both executives and hiring managers advocated an increased use of internships, applied and project-based learning, and e-portfolios as means to better equip students for success in the workplace.

## Conclusions

The conclusions we draw from this evidence are as follows: UCR would be well served by including more general education courses that consider major issues of today and the future taught from a multi-disciplinary perspective. These courses should include more project-based learning experiences. The campus needs to find

ways to encourage our best teachers to engage with general education courses, if that can be done. General education instructors can learn from the practices of instructors in the few breadth courses that are consistently rated highly by students. The new general education curriculum also needs to incorporate ways to help students improve their oral communications and analytical and critical thinking skills. The new curriculum should also provide avenues for students to develop “soft skills” that will improve their success at work and to gain “life skills” knowledge that will help them beyond college, including methods to aid in time and stress management, as well as financial literacy.

Among the campus’s current GE requirements, the evidence suggests that foreign language instruction needs considerable attention; the number of courses appears to be too high given the perceived value of the courses and the possibility of picking up new languages later in life as needed. The desirability of the world history requirement also needs to be established more clearly; it is likely that history courses more closely aligned with students’ majors would be a better option. In general, closer connection between general education courses and majors would be desirable and can be constructed, in part, through “thematic tracks” options that connect to students’ majors (see the discussion in the structure section of this report).

Beyond these content and skill building issues, the evidence we collected demonstrates that many practical matters of scheduling must be addressed for general education to be successful. Popular courses should be offered more often, if possible, and particular attention needs to be afforded to the scheduling of foreign language and ethnicity courses, which have been in too short supply.

## Supplemental Report No. 2: Archival Documents

### Document 1: Committee Time Line and Process

- May 2019: Committee kick-off.
- Summer 2019: Committee breaks into research subgroups. These include groups to: (1) examination of the current state of general education at UCR; (1) study of general education programs at other institutions; (3) development of methods for gathering feedback from campus community including a student survey; (4) development of methods for keeping the campus community informed of Committee's work; and (5) examination of the scholarly literature on general education.
- Creation of lists of departmental liaisons.
- Fall 2019: Discussions about philosophies of general education and organization of general education at other campuses.
- Drafts of pedagogical statements to document the importance of general education at UCR.
- Investigation of methods to send a survey to the campus community for feedback.
- Winter 2020: Committee breaks into subcommittees to prepare proposals based on distinct visions of general education for UCR. These subcommittees produce three proposals for campus review: (1) Crossing Boundaries, (2) Thematic Tracks, and (3) Toward an R'Search Model.
- First discussions of what could be included in an integrative proposal.
- Spring 2020: Circulation of three proposals to UCR faculty for feedback.
- Discussion of three proposals with College executive committees and Senate chairs.
- Initial feedback from faculty on three proposals circulated to the Committee.

Summer 2020: Summary of full faculty feedback circulated to the Committee (June 25).

Initial rough draft of integrative proposal produced for Committee discussion (August). Comments received from several committee members.

Student survey drafted.

Fall 2020: Committee formally votes to produce an integrative proposal (Sept. 9).

New subcommittees formed to produce an integrative proposal. These subcommittees are: (1) Evidence, (2) Guiding Philosophy, (3) Structure, (4) Skills, (5) Course Approvals/Faculty Incentives, and (6) Inclusive Language. A Writing Subcommittee is also formed to prepare the final proposal (Sept. 19).

Student survey fielded (October-November).

Questions for alumni and advisor panels developed.

Winter 2021: Student survey analyzed and results reported to the Committee.

Advisor and alumni panels held.

Course Approval/Faculty Incentives draft completed and circulated (Jan. 19).

Structure section draft completed and circulated (Feb. 12).

Guiding Philosophy section draft completed and circulated (Feb. 23).

Evidence section completed and circulated (Feb. 23).

Skill section completed and circulated (Feb. 24).

First full Gen Ed Committee discussion of the integrative proposal (March 2).

Spring 2021: Discussions of integrative proposal and skills rubrics (March-May).

Revision of Structure section by Donatella and Amy (Apr. 14).

Writing subcommittee meets to discuss and review comments on the integrative proposal (Apr. 30 and May 4).

Language subcommittee checks proposal for inclusive language (mid-May).

Period to review and comment on the integrative proposal (Apr. 23-June 11).

Meeting to discuss and vote on the integrative proposal (June 11).

## Document 2: Alternative Structure for General Education Requirements

### 1. Possible course requirement structure for STEM and non-STEM majors:

<u>Requirements for STEM Students</u>
5 GE approved courses from CHASS/SOBA/GSOE*
1 GE approved course from CNAS/BCOE*
1 Ethnic Studies course
3 Writing Courses
1 Quantitative Reasoning Course
1 Life Skills Course/Seminar

<u>Requirements for non-STEM Students</u>
5 GE approved courses from CNAS/BCOE*
1 GE approved course from CHASS/SOBA/GSOE*
1 Ethnic Studies course
3 Writing Courses
1 Quantitative Reasoning Course
1 Life Skills Course/Seminar

### 2. A Sample of the Course Menus

<u>Examples of CNAS/BCOE GE Courses</u>
Sustainable Energy (CHEM/PHYS/ENG)
The Science of Climate Change (CHEM/GEOL/ENVS)
Earthquake Country (GEOL)
Artificial Intelligence (ENG/CS)
Evolutionary Biology and Human Behavior (BIOL)
Pandemics (BIOL)
The Science of Myth-busting (ENG)
Upper Division GE Courses

<u>Examples of CHASS/SOBA/GSOE GE Courses</u>
History of Science (HIST or PHIL)
The Neuroscience of Human Behavior (PSYC)
The Statistics of Polling (SOC)
The Politics of Climate Change (POSC)
Environmental Justice (ANTH/SOC)
Creating a Biotech Startup Company (BUS)
Cognition and Learning (PSYC/EDUC)
Bio-ethics (PHIL)
Science and Human Understanding (PHIL)
Upper Division GE Courses

### 3. Potential benefits of alternative structure

- a) This will ensure all GE courses will be structured/designed in a way that builds in appeal/interest to the non-major and students from other colleges.
- b) The simplicity of choosing courses from the two broader menus will simplify advising and give students more choice.

- c) Giving students more choice will increase their opportunities to cluster several GE courses in one discipline and possibly pursue minors in the “opposite” college (i.e., STEM or non-STEM).
- d) Giving students more choice and creating a more open market of GE courses will incentivize departments to offer more engaging and interesting courses and/or assign the most dynamic and accomplished instructors to teach those courses. This would ultimately improve the learning experience for students.
- e) Not using the categories of courses will eliminate the need of the GE committee to assign courses to a category (eliminating likely disagreements within the committee).
- f) Categorizing courses based on college of origin will ensure students encounter ways of thinking from faculty trained in disciplines outside of their field of study (e.g., in the current proposal faculty in CNAS could create courses in the History/Creativity/Society categories and allow CNAS students to avoid taking those courses from CHASS faculty).
- g) Limiting the GE requirement within the college in which a student is enrolled to one course will eliminate overlap in GE and major courses (e.g., in the current proposal a CNAS student would need to take three new STEM GE courses since existing courses for majors will no longer count as GE requirements).

## **Document 3: Initial Proposal #1 - Crossing Boundaries**

### **I. Philosophy**

The purpose of general education is to excite a desire in students to engage with topics that will be important to their understanding of the world and to the quality of their lives. It is to provide tools for understanding and expression. And it is to showcase the means by which artists, scholars, and scientists pursue their work.

To fulfill these ends, every student should have a deep engagement with each of four types of intellectual experiences, those associated with (1) the arts and humanities, (2) ethics and civics, (3) social institutions and history, and (4) science and technology. This exposure should include an engagement with subject matter knowledge, and engagement with the ways of knowing that characterize these fields, through aesthetic experiences, through critical consideration of normative frameworks, through social structural and cultural analysis, and through scientific methods. General education provides an opportunity for students to expand their horizons, to learn about the broader world, and to appreciate the contributions and experiences of people from a wide variety of human cultures.

General education courses should provide a model for students to integrate knowledge from disparate fields and sources to understand and respond to the great challenges and trends of the 21<sup>st</sup> century. For this reason, courses in the general education curriculum should address topics of broad interest, rather than serving as introductions to the conceptual apparatus of academic disciplines. These courses are meant to be separate from and to complement standard disciplinary courses. General education courses take on topics like anime, artificial intelligence, climate change, pandemics, the rise of China, satire, and the future of the university, most often through multi-disciplinary lenses. This is why we call the new general education curriculum, “Crossing Boundaries.”

General education should contribute substantially to students’ capacity to express themselves orally and in written work. It should contribute to their ability to discern valid from unsupported information. It should help them to develop their skills in analytical and critical thinking and quantitative reasoning. We refer to these as “critical competencies.”

The “Crossing Boundaries” curriculum stands in clear contrast to the current “menu” approach to general education. A leading critic characterized the menu approach as “an admission of intellectual defeat” because it serves up a “mishmash of courses that are only superficially connected.” Instead, the foundation for higher levels of student engagement and achievement lie in topics that ignite the interest of students, in opportunities for students to build critical competencies, and in teaching that illuminates the subject matter by drawing on multiple disciplines and perspectives.

## II. Structure

The proposed new general education curriculum is intended to provide undergraduate students with exciting and engaging educational experiences in courses that are of broad general interest. Instead of “Introduction to Geology,” the curriculum will provide courses with titles like “Earthquake Country.” Instead of “Sociology of Education,” courses with titles like “Are American Schools Failing?” Instead of “Introduction to Rhetoric,” courses with titles like “Ten Great Speeches.” The proposed new general education curriculum will selectively employ disciplinary knowledge to illuminate topics that engage students’ broader interests. Many course topics will draw on knowledge from several disciplines.

The curriculum is divided into two parts: (1) designated general education courses and (2) courses required of all students. The list of courses that can be used for either of these sections will be maintained by a standing committee that will be in charge of initial approval and periodic review of all courses used for either category.

The **designated general education courses** will include six quarter-length courses, with at least one in each of four course categories: (A) aesthetics and cultures, (B) ethics and civics, (C) social institutions and history, and (D) science and technology. These courses may be cross-listed in more than one category. However, a student can only use any given course to satisfy a single category requirement. These courses should not require prerequisite courses, but can be proposed to require upper-division standing.

The **campus-wide required courses** include: (A) one quantitative reasoning course, (B) two expository writing courses, and (C) two language courses and one “cultures” course. For purposes of the required courses, the current ethnic studies requirement counts in the third category. It should be noted that these courses, rather than simply being lower division courses, would ideally be specifically designed or significantly revamped for the general education curriculum. The quantitative reasoning with data (QRD) course is selected from a pre-approved list. The expository writing courses are taught in small seminars, as in the current University Writing Program. Based on the placement testing students may be required to take three rather than two expository writing classes. Students may place out of the language requirement by taking a proficiency test or on the basis of scores on Advanced Placement tests.

In sum, the courses consist of:

6 Designated General Education Courses (at least one in each of four categories)  
6 Campus-wide Requirements (1 Quantitative Reasoning with Data course, 2 Expository Writing courses, 2 Language courses, 1 Cultures course)

Thus, the total number of courses in the College Curriculum is 12. We assume that the average UCR undergraduate takes 45 courses during his/her four years on campus (three or four courses per term over 12 terms). The remaining 33 courses will be divided between major and elective courses. It will be possible for some courses taught by department faculty to count toward their major, with a portion of seats reserved as such, keeping in mind that such courses must still contribute toward the general education curriculum.

### **III. Format of Designated GE Courses**

The designated general education courses will be conducted in lecture/seminar and discussion, laboratory, or field activity based formats. A minimum enrollment of 15 students will be required and all designated general education courses will be assigned teaching assistant(s). Instructors are encouraged to provide as many opportunities as possible for active learning through debate, discussion, small group problem solving, and other mechanisms.

### **IV. Learning Objectives**

The general education curriculum requires instructors to be explicit about their learning objectives. It requires that courses accepted for inclusion include skill development activities in at least three of five core competency areas: (1) analytical and critical thinking, (2) information literacy, (3) oral communication, (4) quantitative reasoning, and (5) written expression. In applications for acceptance into the new general education curriculum, instructors are required to show how their courses address the competency areas they have identified, and how they will assess skill development in these areas. Instructors will also be asked to describe other aspects of education, such as cross-cultural and inclusivity understanding, independent thinking, creativity, and interdisciplinary thinking, that their courses will be designed to promote. Finally, instructors are asked to show how they will incorporate student engagement and student accountability practices in their classes.

### **V. Examples**

We can illustrate what courses in the “Crossing Boundaries” curriculum will look like through a few examples that (1) contrast a typical current course with a comparable one that is in the spirit of the new curriculum, (2) are of a possible new course with no clear current comparison, and (3) illustrate how current courses, with slight revisions, would align with the new general education system.

Our first example comes from the social sciences. Instead of a standard Sociology of Education course, we foresee a course on the more exciting and relevant theme “Are American Schools Succeeding or Failing?” This course would begin by comparing

U.S. students' performance on international tests with the performance of students in other parts of the world. It would note the high level of performance in states like Massachusetts and the lower levels of performance in many Southern states. It would then turn to diagnosis. It would look at the deficiencies of teacher training and pay in the United States, the ways that teachers' unions protect unqualified teachers, the decline in reading for pleasure among young people, the evidence on whether social media is affecting students' capacities to concentrate, the effects of high-stakes testing on teaching and learning, anti-school peer cultures, the lessons from the "effective schools" movement, the organization of high-performing charter schools like Kipp Academies, and the contrasting chaotic reality of schooling in many high-poverty areas. Students would be exposed to a wide variety of social science methodologies, including statistical studies, interview studies, and ethnographies. The course would ask students to come up with a policy analysis of possible solutions that can lead to better performing schools, thereby including a public policy component.

Our second example lies at the intersection of pop culture and engineering, and would draw upon the collective passion and expertise of a number of current faculty members. Superhero comic books currently enjoy significant popularity due to the widespread success of movies based on the decades-long repository of stories set in fantastical fictional universes. A course on the "Science of Superheroes" would engender a great deal of interest and excitement, and would easily lend itself to being collaboratively taught in blocks. For example, one block might start with a critical examination of black representation through the evolution of depictions of Luke Cage, and merge into a bioengineering-based study of the bulletproof skin the character is famous for. Another block could focus on the indestructible nature of Captain America's shield and the literary symbolism involved in various story arcs before introducing material science and engineering to think critically about the fictional metal the shield is largely composed from. Students would be required to think critically about fictional concepts, and in doing so, gain a cross-boundary appreciation for the inherent ties between what might otherwise appear to be disparate disciplines.

We note that an array of current courses could, with varying levels of modification, be revised to be suitable for the new General Education curriculum. (A sample of these courses is listed in Appendix A.) BIOL 30 (Human Reproduction and Sexual Behavior) provides a good model for a course that deals with contemporary topics of interest and importance to students, and that integrates concepts and perspectives from multiple disciplines. The course is based in the science of human reproduction and sexuality. It presents the subject matter in the context of history, cultural diversity, politics, perception, religion, and more. For example, the first class sessions include a historic perspective of sexuality in the western world, touching on Judaic and Christian traditions, and discussing major changes in views of sexuality as well as scientific and technological advances such as oral contraceptives, Viagra

and the internet. The course also covers the cultural legacies of sex for procreation and rigid gender roles, and the concept of sexual intelligence. The current instructor uses lecture, video, activities, guest speakers, and more to bring diverse perspectives to topics and to give students an opportunity to participate and to explore the subject area and themselves.

## **VI. Costs and Benefits**

### **A. Costs**

A major cost of the new curriculum will be in faculty time in developing new designated general education courses and in revising current courses to meet requirements for the new general education curriculum. To minimize this cost, the committee has provided a standard application form (see below in section VI) and incentives to encourage the development of new and revised courses (see below in section VII).

The new curriculum will require service from a committee whose task will be to review and approve applications and to monitor the success of designated general education courses. This will also include periodic review of all general education courses to ensure that courses maintain their initial quality and are not reverting to departmental courses with elevated enrollments. This work will be time consuming. To assure conscientious commitment of committee members, we recommend that those appointed to the committee be provided with a one-course teaching reduction for every two years of service. We expect committee members to serve two year terms. If the chair of the committee determines that a member is not contributing sufficiently to the work of the committee, they can request the removal of the committee member.

To avoid overly niche courses, designated general education courses will require a minimum enrollment of 15 students. We further recommend that most departments drop their upper-division course requirements to no more than 45 units, with exceptions allowed with sufficient justification. This will streamline the curriculum and create opportunities for instructors to offer designated general education courses.

Some departments that currently depend on general education enrollments may be negatively impacted by the new curriculum. For example, world history is a requirement in the current general education curriculum but will not be a requirement in the new curriculum. The new curriculum addresses this issue by providing opportunities for impacted departments to be strongly represented among the designated general education courses as well as in the divisional requirements and the “cultures” requirement. World History, for example, can be included as a choice in the divisional requirements as well as a choice in the “cultures” requirement. Topics in world history courses can be built out and taught as

designated general education courses. For example, courses on “The Rise and Fall of the Roman Empire” or on “The Chinese Century?” would be welcome additions to the general education curriculum.

## B. Benefits

The courses are expected to excite student interest by focusing on topics about which students are curious. Many general education courses will focus on topics that represent challenges and trends that will continue to be important after graduation – topics such as pandemics, artificial intelligence, climate change, the rise of China, the consequences of rising inequality, great works of science fiction, and perhaps even a course on the path-breaking musical *Hamilton*.

A major difficulty with the “menu approach” that currently exists in the UCR general education curriculum is that it fails to guarantee an enriched educational experience with topics that can engage the interest and imagination of undergraduates. Instead, departments propose courses that will satisfy distributional requirements and students choose, rather blindly, among these options. Little, if any, quality control exists because many of the current courses are introductions to disciplines and responsibilities for teaching the courses circulate among instructors who may have widely different capacities for engaging introductory students.

The new curriculum will bring benefits to students through required specification of learning objectives and skill development activities, through heightened understanding of the ways of knowing, or epistemologies, practiced by the academic disciplines, and especially through the intellectual excitement produced by high-quality courses better tailored to student interests. Most importantly, the new curriculum will bring coherence to a general education program that has long lacked coherence because of its reliance on the “menu approach” to general education.

Instructors will also be expected to show students how the studies they present establish their truth-claims and/or create aesthetic experiences. This working through of artists’, scholars’, and scientists’ ways of knowing will benefit lower-division students as they approach upper-division work. They will equip students to analyze and critique truth-claims and to assess the insights that can be gained through different methodologies and why these methodologies are appropriate for particular sets of problems and not others. In addition, general education courses will add value by contributing to students’ academic skill development. Instructors proposing new and revised courses for the designated general education curriculum will be required to specify their learning objectives for the course, and how they will assess whether their learning objectives have been met. They will also be asked to discuss the skill development activities in their courses and how they will be assessed.

## **VII. Faculty Incentives to Participate**

The campus recognizes that the development of new courses is time consuming. This is especially true for courses that must meet a variety of goals, including specification of learning outcomes, skill development activities and their assessment, introduction to methods of knowing, and interdisciplinary perspectives. The campus also recognizes that service on the proposed committee to review, approve, and monitor the success of general education courses will be time consuming during the first several years of program administration.

Because of the time commitments entailed, the campus is prepared to provide incentives for faculty participation, as follows.

- (1) Instructors who develop two new general education courses will be eligible for one course reduction following approval of both courses. Instructors who request teaching reductions are expected to teach the courses they develop during the first or second year of the new curriculum. Team taught courses are encouraged but course relief will be available for only one instructor in team taught courses.
- (2) Members of the General Education Review Committee will be appointed jointly by the Committee on Committees (CoC) and the EVC/Provost. Members of the committee will be eligible for one course reduction if they commit to two years of review committee service.

## **VIII. Process and Forms for Course Approval**

The quality of courses offered in general education is of pre-eminent importance. If the courses are not of high quality, the purposes of general education cannot be achieved. For this reason, we propose a rigorous process of course development and review. Courses accepted into the general education curriculum must first be accepted by a review committee charged with maintaining the high standards expected of general education courses with special emphasis on the capacity of the topic to excite student interest, the thoughtfulness with which skill development activities are incorporated, and the capacity of the course to showcase the methods of research, scholarship, and creation.

New courses must be approved by both the General Education Review Committee and the Senate Committee on Courses. Revised courses that are responsive to requirements for general education courses must be approved by the General Education Review Committee.

Instructors who wish to have classes included in the new general education curriculum will be asked to fill out an application form available at [www.gened.ucr.edu](http://www.gened.ucr.edu). Proposals will be reviewed by the General Education Committee, with approvals and requests for revision going out in May 2021.

A draft course proposal template is included below.

**Draft Proposal Template: New General Education Courses**

1. Name(s): \_\_\_\_\_
2. Department(s): \_\_\_\_\_
3. Title of Course: \_\_\_\_\_
4. Core areas covered by course
  - a. Aesthetics and cultures \_\_\_\_\_
  - b. Civics and ethics \_\_\_\_\_
  - c. Social institutions, histories, and individuals \_\_\_\_\_
  - d. Science and technology \_\_\_\_\_
5. The new general education courses are expected to excite the interest of undergraduates by addressing broad topics of general interest. Discuss why and the ways in which this course addresses issues that are or can be of great interest to undergraduates:

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6. In the new general education curriculum, courses are **not** intended to be introductions to disciplines, though concepts and principles from the disciplines can and should be woven into the courses. Discuss the ways in which your course draws on disciplinary knowledge. Please include a discussion of how students will become acquainted with the methods for making truth claims in your discipline or, if you are proposing an arts course, the methods you will be discussing for creating aesthetic experiences:

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7. Please identify at least five learning objectives of this course and how you will organize material to meet these learning objectives:

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8. The new general education curriculum requires courses to contribute to the development of student skills in at least three of five core competencies (analytical and critical thinking, information literacy, oral communication, quantitative reasoning, and written expression). Discuss the ways that this course contributes to the development of at least two of these core competencies:

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9. Discuss how you will assess whether students have made progress in the core competency areas you have chosen:

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10. Please describe your teaching style including the methods you use to encourage student participation and student accountability for reading and homework:

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11. Please attach a draft syllabus for your proposed course.

## **Document 4: Initial Proposal #2 – Thematic Tracks**

### **I. Philosophy**

The goal of general education at UC Riverside is to produce students who have the knowledge and skills to contribute to society. General education will focus on three primary intellectual domains:

**Communication Skills:** UCR students will have strong oral and written communication skills and will have the ability to communicate both information and ideas effectively.

**Information Literacy Skills:** UCR students will be able to find, interpret, evaluate, and use information in all its various forms to make decisions, solve problems, and create knowledge. They will be able to judge the veracity of information and distinguish reliable information from misinformation. These abilities will be rooted in strong critical and quantitative reasoning skills.

**Contextualized Knowledge:** To support intellectual inquiry, UCR students will gain knowledge of a variety of topics from multiple perspectives. They will have knowledge about the history and operation of social, political, economic, and governmental institutions. They will have knowledge of science, technology, and mathematics and how knowledge is created in various disciplines including art, social sciences, humanities, and the natural sciences.

The thematic track model for general education will provide students with the opportunity to gain these skills and knowledge in the context of a significant problem of current importance to society. General education will be organized into “tracks,” with each focused on a specific problem. In pursuing a track, each student will gain both general knowledge and skills, and specialized knowledge and skills related to a topic of interest to them. In this way, all students will be prepared to face new challenges, and collectively, cohorts of students will have a broad range of knowledge about specific challenges. It is not possible for everyone to be an expert in all areas. The track model ensures that UCR produces students that collectively have the knowledge needed to contribute to understanding and solving the world’s most pressing issues.

A strength of the thematic track model is that students will gain the ability to reason about problems from multiple perspectives, which is essential for solving complex problems. For example, the City of Berkeley, CA recently passed an ordinance banning the use of natural gas in new homes. While this may at first

appear to be a good solution to climate change, examining the problem from the perspective of physics suggests the problem is much more complicated. Producing heat from electricity rather than natural gas can actually increase greenhouse emissions. For example, if the electricity is produced by a natural-gas-fired power plant, emissions would more than double. Similarly, California recently signed into law a bill requiring that high school classes begin no earlier than 8:30am. This law is rooted in a wealth of psychological and physiological research about the sleep needs of teenagers. However, understanding the costs and benefits of this law requires consideration of many perspectives. For example, later start times could produce child-care and transportation problems that may disproportionately impact low-income families and single parents. In short, to contribute to solving complex problems, students must be able to examine them from multiple perspectives. The thematic track model will provide students with just this kind of experience.

Another strength of this model is that it will provide colleges and schools with flexibility in designing and managing the course requirements for their programs. Currently, UCR's colleges/schools require between 11 and 18 general education courses, excluding English composition. A thematic track will comprise five or six courses focused on a topic. Thus programs will be able to develop their own requirements for between six and 13 general education courses. In this way, the thematic track model will be an improvement to, rather than a wholesale replacement of, UCR's current model of general education.

## **II. Structure**

The overarching goal of the thematic track model is to produce students that can reason about problems from multiple perspectives. This depends critically on a student's ability to understand the language used in various fields and the ability to communicate with experts in those fields. The disciplinary courses selected for a track will be chosen to foster these abilities.

In this model, the general education tracks will consist of five or six courses. Colleges and schools can select additional general education courses to satisfy other requirements such as University requirements and requirements imposed by accrediting bodies such as WASC and ABET. Limiting the tracks to five or six courses will have a number of advantages, all of which ensure that every UCR undergraduate student, irrespective of college, school, or time of entry, will complete a general education track by the time of graduation. These advantages include:

1. For students that enter as freshman, the general education courses within a track can be spread out over four years, which gives students and majors (especially those that are highly structured) flexibility in course scheduling.

2. Transfer students who plan on graduating in two years would take, on average, one general education course per quarter, which should be manageable.
3. General education courses in this scheme could be a mixture of lower division and upper division courses, with the possibility that existing courses, including large lower division courses, could still be offered as possible gateways for multiple tracks. In this way, concerns about course capacity issues are alleviated.
4. This model alleviates the pressure of identifying 15 - 18 general education courses within a theme.

One model would be to require all tracks to require a number of general disciplines focused around a theme. For example, a distribution that could include both lower and upper division courses would minimally include the following:

1. One writing course that satisfies the English 1C requirement (this could be satisfied with general topics 2 - 5 below and may not be a standalone course)
2. One course in social sciences
3. One course in humanities or the arts
4. One course in quantitative reasoning
5. One course in natural science or engineering
6. A capstone course related to the major

### **III. Learning Objectives**

As described under Philosophy, the Thematic Track model of general education will impart communication skills, information literacy skills, and contextualized knowledge. The curriculum will be designed to impart several core competencies including:

- **Communication Skills**
  - Students will be able to understand and identify the difference between opinion and fact and be able to distinguish between logical fallacies and sound logical arguments.
  - Students will be able to use critical thinking skills in oral and written communication.
  - Students will be able to understand the language used in various disciplinary fields and be able to communicate with experts in those fields.
- **Information Literacy**

- Students will be able to find, interpret, evaluate, and use information in all its various forms to make decisions, solve problems, and create knowledge.
- Students will be able to judge the veracity of information and distinguish reliable information from misinformation.
- Students will be able to articulate the strengths and weaknesses of empirical claims.
- **Critical Reasoning**
  - Students will be able to formulate, analyze, and interpret ideas and concepts.
  - Students will be able to use principles of mathematical and scientific reasoning to analyze and solve problems.
  - Students will be able to examine problems from multiple perspectives.

#### **IV. Costs and Benefits**

The current “menu-driven” model of general education suffers from a number of issues. Perhaps the most important issue is that the list of courses that satisfy the requirements are simply that: a list of unrelated courses. With a thematic track, students can choose a theme that is attractive to them. This should engage students, hopefully awakening their curiosity, giving a clear purpose to their general education, and making the general education requirement a center-piece of their experience at UCR.

Students will explore their chosen theme from a number of different perspectives, for example, sociological, political, economic, historical, technological, and scientific. Students will see, more or less automatically, that important issues must be viewed from different perspectives, and that one that might look good from one point of view might have serious consequences in other domains. One such example might be the use of electric vehicles, which can significantly reduce the pollution where they are used, but can have serious consequences where the necessary batteries are produced. It is also critical to see how issues can be interrelated, such as the unequal effects of pandemics on people with differing income levels.

We anticipate some startup costs for developing thematic tracks. For example, it may be necessary to provide incentives for faculty to develop tracks. Also, a Senate standing committee will be needed to oversee the tracks. Finally, there may be a redistribution of student FTE resulting from the development of new general education courses. We discuss the course approval and monitoring process below in Section VI, as well as incentives to faculty for developing tracks.

## **V. Examples of Thematic Tracks**

To illustrate what thematic tracks will look like and what they can accomplish, we include two examples that draw, either wholly or in part, on existing UCR courses.

### A. Technology & Society

This track focuses on the ways scientific, technological, and social factors interact to shape modern life. Students in this track will be well-prepared to participate in addressing various societal issues such as sustainable energy production, technology and inequality, pollution, and healthcare policy. Students in this track will complete coursework that includes topics in science, mathematics, humanities, and social science. Coursework in science and mathematics will enable students to understand and communicate scientific concepts, and will also provide students with knowledge of fundamental scientific principles needed to understand technological issues. Coursework in humanities and social science will provide students with skills and knowledge needed to understand both the social consequences of scientific and technological developments and the ways in which these processes are themselves shaped by society (taken from UCB's program).

#### Course Requirements:

- 1) 4 units of introductory science
- 2) 4 units of mathematics
- 3) 4 units related to sustainability
- 4) 8 units related to the impacts of technology on society

#### Existing UCR Courses:

The following existing courses at UCR are aligned with the goals of this cluster. However, these courses would need to be adjusted to be useful as general education courses. For example, many of these courses are unsuitable in their present form because they require prerequisites and because they are upper division courses.

PBPL 129 Understanding Sustainability. Survey of the concepts, principles and tools from diverse fields that contribute to understanding and responding to

problems such as climate change, environmental degradation, and unequal distribution of limited resources. Leads to an appreciation of the social, gendered, political, economic, natural and social scientific principles and theories underlying sustainability.

PBPL 170 Technology, Policy, and Ethics. Provides contemporary perspectives on interplays between technology, public policy, and ethics. Covers social, legal, and ethical issues such as liability, as well as environmental, patent, and copyright law. Cross-listed with ENGR 170.

PBPL 171 Globalization. Covers technological drivers of globalization. Includes social, economic, and political consequences. Explores the cultural aspects of globalization, including barriers and drivers for economic and cultural interdependence and integration, as well as virtual global organizations. Cross-listed with ENGR 171.

HIST 104 The Scientific Revolution. History of the scientific revolution of the sixteenth and seventeenth centuries from Copernicus through Newton, stressing the cultural interaction of science, philosophy, and religion, with secondary attention to the historical sociology of science. or consent of instructor. History of science in the nineteenth and early twentieth centuries, stressing the rise of the Darwinian world view, the genetic revolution and its social consequences, and the romantic rejection of science.

HIST 106 Science in Triumph and Crisis. Prerequisite(s): upper-division standing or consent of instructor. History of science in the twentieth century with attention to the revolutions in physics and biology, the role of scientists in the world wars, the social responsibility debate, and the rise of the United States as a scientific power.

HIST 108 Technology in Premodern Civilizations. Examines relations between society, machine, and state in ancient China, Greece, Rome, and medieval Europe. Focuses on key mechanical and civil technologies and the role of the state in differentiating their development between the four historic civilizations. Cross-listed with ENGR 108.

HIST 109 Technology in Modern Europe and America, 1700-Present. Examines the emergence of modern Europe through the first and second industrial revolutions in Europe and America. Explores the development of device commodities as the typical form of consumer technology in the nineteenth and twentieth centuries, as well as addresses philosophical issues in understanding technology. Cross-listed with ENGR 109.

HIST 110 History of Ancient Astronomy. Explores the origins and history of ancient astronomy from Mesopotamia to the Greco-Roman world. Topics include the problems of the calendar and planetary motion, and the relation between astronomy

and astrology in the ancient world. Focuses on readings from primary texts. Cross-listed with CPAC 134.

ENGR 096 Environment and Society. Presents major environmental issues facing society from an interdisciplinary perspective. Topics may include water, energy, climate change, and urbanization. Cross-listed with NASC 096, and HASS 096.

ENGR 108 Technology in Premodern Civilizations. Examines relations between society, machine, and state in ancient China, Greece, Rome, and medieval Europe. Focuses on key mechanical and civil technologies and the role of the state in differentiating their development between the four historic civilizations. Cross-listed with HIST 108.

ENGR 109 Technology in Modern Europe and America, 1700-Present. Examines the emergence of modern Europe through the first and second industrial revolutions in Europe and America. Explores the development of device commodities as the typical form of consumer technology in the nineteenth and twentieth centuries, as well as addresses philosophical issues in understanding technology. Cross-listed with HIST 109.

ENGR 170 Technology, Policy, and Ethics. Provides contemporary perspectives on interplays between technology, public policy, and ethics. Covers social, legal, and ethical issues such as liability, as well as environmental, patent, and copyright law. Cross-listed with PBPL 170. The goal of the program is to set up a forum to explore the relationship between what scientists and engineers do and the constraints, needs, and responses of society.

ENGR 171 Globalization. Covers technological drivers of globalization. Includes social, economic, and political consequences. Explores the cultural aspects of globalization, including barriers and drivers for economic and cultural interdependence and integration, as well as virtual global organizations. Cross-listed with PBPL 171.

Several universities have programs in Technology and Society, including MIT, Stanford, the University of California, Berkeley and the University of Pennsylvania. Information about these programs is available on request.

### B. Sustainable Energy

The broad goal of the second example track is to provide an experience for students in which they grapple with the problem of building a sustainable energy infrastructure from an interdisciplinary approach. This will provide a more engaging context for students when taking breadth courses outside of their college/school, and will provide a more well-rounded learning experience by requiring students to address an important real-world problem from multiple ways

of thinking. This thematic track will also aim to incorporate some of the WASC core competencies into the specific learning outcomes (e.g., quantitative reasoning, critical thinking, and oral/written communication).

### Course Requirements:

- 1) 4 units of introductory science
- 2) 4 units of social science
- 3) 8 units of introductory economics
- 4) 8 units of environmental ethics
- 5) 4-unit capstone course

### Existing and Proposed Courses:

In addition to the University requirements (one course in Ethnic Studies, one class in World History, the English 001 writing series), students would be expected to complete the following courses:

**Introductory Chemistry.** This will be a new course proposed and created by the chemistry department. This course will require students to learn basic elements of chemical reactions, how mass and energy changes are tracked in chemical reactions, and general principles of physical and chemical changes. These foundational principles will be taught within the context of sustainable energy technologies, including, but not limited to solar energy (photovoltaic cells), fuel cells, batteries, nuclear energy, and “artificial leaves” (converting CO<sub>2</sub> into liquid fuels in a carbon neutral manner). This course will include elements of quantitative reasoning and critical thinking, and can be used to fulfill natural science/physical science breadth requirements.

**Introductory Economic.** This might entail creating a section of ECON 002 (Macroeconomics) that focuses on the macroeconomic issues of creating a sustainable energy infrastructure, or might necessitate the creation of a new breadth course. It is expected this course will include elements of quantitative reasoning and critical thinking, and can be used to fulfill social science/economics breadth requirements.

**Anthropology/Sociology.** This will likely entail creating a new course that focuses on addressing social justice issues within the context of current energy infrastructures and how sustainable energy infrastructures can impact social justice outcomes (e.g., how sustainable energy infrastructures would impact less economically-developed regions/cultures). This course will include elements of

critical thinking and oral/written communication, and can be used to fulfill social science breadth requirements.

Philosophy 003 (Ethics and Meaning of Life) or Philosophy 117 (Environmental Ethics). These existing courses could potentially be taught in a way to focus on the ethical dilemmas that arise from our current energy production infrastructures, and how sustainable energy infrastructures address (or do not address) these ethical dilemmas. This course will include elements of critical thinking and oral/written communication, and can be used to fulfill humanities breadth requirements.

Philosophy 117 (Ethics and the Environment): “A philosophic consideration of ethical problems that arise from the use and exploitation of the environment.”

Engineering 060 (Engineering Economics). This course could potentially be taught in a way to focus on the engineering requirements of moving to a completely sustainable energy infrastructure, including the economic ramifications of making the required engineering changes. This course will include elements of quantitative reasoning, critical thinking, and oral/written communication, and can be used to fulfill potential engineering breadth requirements (currently no other college/school requires an engineering course).

Capstone Course. How this will be offered (i.e., what course will fulfill this requirement) is to be determined. This might include a re-purposed version of ENG 001B/001C, a department/major upper division independent research course (e.g., 197 or 199 courses), or a newly created general education capstone course. Students will be required to incorporate how the problem of sustainable energy is evaluated by different disciplines, and must incorporate the ways of thinking that were uncovered in each of their track courses. This course will include elements of quantitative reasoning, critical thinking, and oral/written communication.

## **VI. Process and Forms of Approval of Courses**

### **a) Creation of Thematic Clusters**

We propose generation of a standing Academic Senate General Education Committee which will be tasked with overseeing the creation and implementation of the Thematic Track model. Details on the structure and workflow of the committee are provided below. The committee will solicit proposals from the faculty-at-large. This will include an open call for Track proposals, to be incentivized with mini-grant awards. Additionally, committee members may seek out faculty from specific departments if that expertise is required for a given Track. For example, if the committee seeks to create a Track in which a course from Economics is needed, faculty from that department will be contacted directly by the committee. In the call for

proposals, faculty will be invited to join an existing Track created by the General Education Committee, or submit their own proposal for a new Thematic Track. Thematic Tracks will be reviewed and approved by the committee as described below. If a Thematic Track course will be team-taught, any stipends/mini-grant awards would be divided accordingly and departments would be expected to support these types of teaching assignments.

b) Incentives for Faculty

Obtaining buy-in from faculty to participate in a Thematic Track will require a one-time course release to enable the creation of a new course, or adaptation of an existing course. Once the Track is running, the representative departments will be required to support the faculty member by allowing the general education Track course to count toward the annual teaching load. All faculty members engaged in developing a new Thematic Track will also be given a stipend through the mini-grant award program. This stipend can be used to provide partial summer salary support, allowing the Track faculty to devote time to course creation/adaptation, and/or for the purchase of necessary course materials (this stipend would only apply for the creation of new tracks, not teaching existing tracks).

c) Requirements for Thematic Track Faculty

Because the faculty in the Thematic Track will be given a one-time course release in the first year of the Track implementation, they will be expected to meet periodically throughout the year to coordinate how the Track topic is being integrated in each course. The Thematic Track faculty will also be expected to coordinate their classroom activities and to highlight how their course is connected to the other courses in the Thematic Track. The Thematic Track faculty will be expected to submit a brief report to the Academic Senate General Education Committee at the end of year-one implementation. This report will summarize how the Theme was integrated into each course and which of the core competencies were integrated into those courses. Thematic Track teams will be required to submit annual reports to the General Education Committee, providing updates regarding any changes that were made and/or which competencies were included in the courses.

d) Ongoing Oversight of Thematic Tracks

The proposed standing Academic Senate General Education Committee general committee will ideally have cross-membership with Committee on Education Policy and the Committee on Courses. The committee could

comprise two members from each of CHASS, CNAS, and BCOE one member from each of the Schools of Public Policy, Education, and Business. Subsets of the committee would then oversee individual tracks based on the colleges hosting the courses.

Oversight at the level of all tracks, by the Senate committee, would involve confirming that:

- the tracks themselves are still relevant for modern general education
- emerging or new areas are considered for new track development
- tracks are distinct enough; some tracks might be merged
- tracks are viable (Tracks may be terminated if enrollments do not meet a minimum threshold)

Oversight at the level of individual tracks, by subcommittees for each track, would involve confirming:

- the number of offerings match demand
- courses exist to cover the learning outcomes of the track
- faculty teaching the courses communicate at some level

e) Course Creation and Approval

When new courses are prepared, the proposers could indicate if the courses are likely to be part of a track. There should be parallel efforts between the General Education Committee and the regular approval process. This would help to ensure that once a course is approved by the regular process, it is ready for use in a track.

*New courses.* Proposals for new courses would need to go through the subcommittee prior to the usual course creation/approval steps:

Department --> College Executive Committee --> Committee on Courses

*Adapting Existing Courses.* In lieu of creating new courses, existing courses could be adapted by modifying their syllabi and activities to fit the learning outcomes of a Thematic Track. Regular evaluation of course content and synergy among courses would be the best way to keep tracks consistent with learning outcomes and to minimize redundancy.

It will be very helpful for a subcommittee overseeing a track to look within the UCR Catalog for existing courses that can be adapted.

Regardless of whether new courses are made or existing courses are adapted, some courses might be cross-department and cross-campus and would require significant time input from the faculty. (See the discussion of incentives for faculty above.)

## **Document 5: Initial Proposal 3 – Toward an R'Search Model**

### **Preamble:**

The members of this working group share the belief that a General Education reform should be the product of the collective wisdom of the UCR campus and surrounding communities, and thoughtfully drawn from the needs, strengths, and experiences of those communities. As a necessary first step, we propose the following locally informed pedagogical and epistemological foundation as our contribution to a forthcoming consensus document. Because the new model for general education with which the General Education Review Committee has been charged must reflect the insights and scrutiny from all members of the General Education Review Committee and other UCR stakeholders, this proposal is intended to receive and include all voices. We see the concurrent proposals under discussion as complementary, and offer to those proposals a framework that builds upon the scholarly aspirations of UCR. We further emphasize that the collaborative development and implementation of a new model can provide general benefits to the university that go far beyond undergraduate education. For example, this approach can draw attention to broader issues in academia, such as how and why certain cultures of knowledge production and their associated groups are elevated over others.

### **R'Search Philosophy and Vision:**

The R'Search general education model intends to prepare students to critically, thoughtfully, and ethically contribute to the challenges and possibilities of society. Rather than conceptualizing general education as an add-on to a major, the R'Search model fosters the idea that education is dynamic, agentive, ongoing, and multifaceted. The R'Search model structures a student's major(s), general education coursework, and electives to support an understanding that all knowledge can and should be "*re-searched*" through multiple lenses, including creative arts, scientific methods, social analysis, and ethical, community-based relationships. "*Re-search*" is also an attitude of awareness of the multiple linear, transnational, disciplinary, and creative contexts through which knowledge and ethics are produced, solidified, transformed, and disseminated.

The R'Search model aligns with UCR's mission to "transform the lives of the diverse people of California, the nation, and the world through the discovery, communication, translation, application, and preservation of knowledge." R'Search does not take knowledge for granted. By teaching the histories, cross-disciplines, and uneven power dynamics that shape the very construction of knowledge, R'Search reflects and furthers the university's responsibilities as a land-grant school and as a Hispanic-serving institution co-founded by Indigenous historians

with many first-generation students of color. Moreover, R'Search fosters student engagement with both the local community and wider world, putting UCR on the map.

Grounded in this model is an intent to be transformative, particularly with respect to understanding the sociopolitical and technological contexts through which knowledge is produced and shared. Its goal is for students to gain a complex understanding of the formations and critiques of academic disciplines over the course of human and non-human history through artistic, political, cultural, linguistic, scientific, and literary movements. From this approach, the design and delivery of courses is just as important as their content. The R'Search model captures how social conditions and various practices and beliefs underlie what gets taught, as well as how ideas are framed, circulated, and debated. As detailed below, courses designed through this model would critically examine the construction of knowledge throughout, and include an interrogation of the costs of knowledge and by whom and from which perspectives the benefits of knowledge are considered. Courses might also explore how different research methods (e.g., collaboration, community-based, lab work, creative activity) produce, reproduce, and/or transform knowledge construction.

The philosophy outlined above is captured in the name "R'Search," which can be read as UCR-focused search; *our* search (reflecting the concept of learning together); *research*; and *re-search* (i.e., searching multiple times, from diverse frameworks, ways of knowing, and lived experiences), which the courses we envision for this model will emphasize. As a Research 1 (R1) institution, UCR should have not only research-oriented faculty but also research-oriented students. The model includes the "traditional" *r*'s of education ("Reading, wRiting, 'Rithmetic"), incorporates existing areas of focus at UCR such as (the aRts and the study of racism), and also extends into respect, responsibility, reciprocity, reflexivity (an awareness of one's predispositions/biases), and relationality (seeing all things in contested, complex, and generative relationship to each other). It places community at the center, as depicted in the following figure:



The name “R’Search” also aligns with other *R*-naming at UCR (R’Kids, R’Pantry, R’Garden, and R’Movement, among others), and thus lends itself to branding, to building pride among UCR students, to emphasizing a special (though not exclusive) focus on the communities around the Inland Empire, and to drawing from the community knowledges that are held within the UCR community.

### **R’Search Structural Framework and Learning Outcomes:**

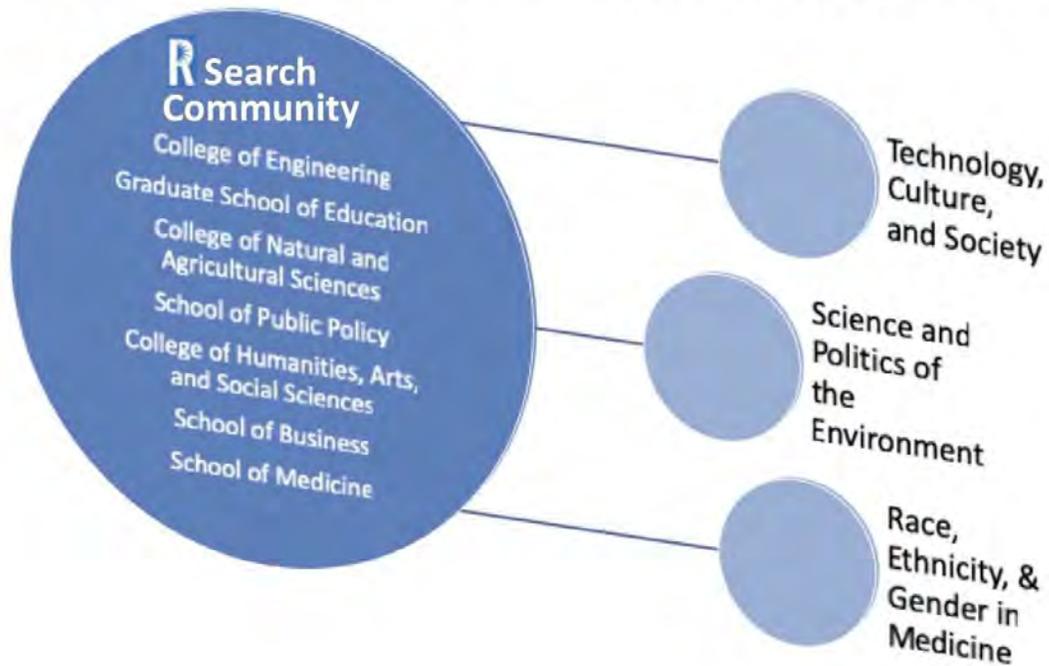
The R’Search model is intended to bridge lower-division, breadth GenEd courses (e.g., Calculus or Introductory Anthropology) with upper-division capstone-type courses whose purpose is to “embed breadth into competence” through integration of multiple areas of content and ways of knowing. In recognition of UCR’s many transfer students, we envision that the lower-division breadth requirements will continue to be aligned with California’s community colleges, thus allowing some of the General Education requirements to be completed elsewhere (see Appendix 1 regarding the Intersegmental General Education Transfer Curriculum). We also envision a further streamlining of the breadth requirements across UCR’s Schools and Colleges more than what currently exists so that students will not need to complete distinct GenEd requirements if they change majors across colleges (see Appendix 2 for some current breadth requirements by college).

Core to the R’Search model are upper-division **integrative** courses, ideally in seminar formats. Each student will take a total of three upper-division courses that

weave together diverse perspectives around a common theme or issue. This will facilitate students' explorations and skills development, and also brings transfer students into the R'Search Community. Part of the goal of these upper-division courses is to enable in-depth examination of a given issue or theme from multiple disciplinary points of view. From this approach, the delivery of a GenEd course content matters just as much as the content itself. An R'Search course should not only be characterized by the type of content, but also by the multiple frameworks in which the content is contextualized. For instance, a "standard" physics course is geared towards giving students fluency in an official or de facto canon, with limited enquiry on how, when, and why a certain theory became part of the canon. A course created through the R'Search model will emphasize the framework that permitted the topic to become canonical, which theory it superseded, whether in different contexts/cultures alternative theories were developed, how the new theory fit within the broader cultural landscape of a time and place, and how the dominant paradigm accepted/ rejected the new theory. Similarly, an R'Search course might also explore why certain types of freedoms are deemed more important than others – for example, the centrality of individualist pursuit of profit rather than communal access to health, and how genealogies of concepts of freedom are related to preeminence of particular political-economic ideologies as emanating from certain privileged cultural geographies and their attendant military-industrial arsenals. Another R'Search course might examine how basic research in nuclear physics leads both to bomb production and to new medical interventions. We present some sample upper-division R'Search integrative courses in Appendix 3.

Key is that these courses should build students' capacity for engaging with complex issues. These could be discrete integrative seminars or could also be organized as sets of courses in integrative thematic tracks. For example, the following sample tracks, one of which is drawn from the Thematic Tracks Working Group ("Technology, Culture, and Society"), illustrate how we imagine coursework within tracks as being inclusive of multiple colleges and schools as indicated by the figure below:

# Possible Community Paths/Tracks



The R'Search model envisions teaching and learning across lower- and upper-division GenEd courses as part of a collaborative community building experience. This recognition acknowledges that each person contributes in multiple ways to building R'Search Community by bringing their lived experiences, cultural knowledges, and skills to the teaching learning process. This also means learning outcomes are not just aligned course by course, but also considered across larger tracks/paths, including in community engagement/service learning opportunities. Although the final version of learning outcomes associated with a new GenEd model would need to be further developed, we suggest as a starting point the following learning outcomes/objectives, many of which are reflected in the 15 VALUE rubrics operationalized by the Association of American Colleges and Universities (<https://www.aacu.org/value>):

- develop critical awareness of knowledge production, transformation, perpetuation, and dissemination
- appreciate different ways of knowing
- understand the ethics and politics of diverse research perspectives
- understand one's relationship to certain ways of knowing and knowledge systems
- make connections across fields of knowledge
- historicize theories and cultures
- solve urgent contemporary problems
- foster creativity and collaboration
- critically read media's representation of race, ethnicity, gender, and class

- express ideas clearly and persuasively
- apply lessons toward social justice action
- attend to Riverside-specific issues
- foster an ability to discerningly identify and criticize the biases of the course itself

Whatever the final learning outcomes of a GenEd model become, we emphasize the need to revisit and identify how and where these learning outcomes/objectives are evident in the courses and overall GenEd program.

### **Resources and Structure for Implementation:**

We envision that GenEd courses should go through an additional approval process beyond the university's general course approval system. A new R'Search Committee on Courses would be responsible for overseeing the process of R'Search course development, as well as approving proposed courses for inclusion in the GenEd curriculum. The committee should be transdisciplinary and its members should be provided opportunities for additional training in curriculum design. This R'Search Committee on Courses would ensure that the spirit of the R'Search model is fully captured by specifying a set of potential learning objectives/outcomes and determining the specific standards by which courses would be approved. The committee would be empowered to offer feedback for curricular proposals, akin to what occurs in the peer review for most academic publications. However, this review process should emphasize the instructor's academic freedom, allowing instructors to tailor their assignments (and how students express and disseminate their knowledge) to make the best of their own and/or students' strengths.

While some pre-existing UCR courses will fit into the R'Search framework with little or no modification, we emphasize that a transformation of UCR's existing breadth model will require the creation of new courses, and the UCR administration will need to be on board with funding this process along with the associated training/professional development. Some of the incentives for faculty that could make developing new R'Search courses appealing include the opportunity to promote collaborative pedagogies across colleges, centers, and departments in ways not currently possible. We also propose a one-quarter residency for groups of faculty campus-wide to engage with this model, especially to support the development of these collaborative courses and R'Search methodologies. In particular, because current academic training often calls for a sharp disciplinary focus, faculty developing R'Search courses may need support in the integrative framework this model calls for. With the appropriate resources, the development and teaching of R'Search courses can integrate faculty from multiple disciplinary backgrounds. The associated reduction of disciplinary silos would be a broader benefit to UCR and aligns with the spirit of community building at the center of the R'Search model.

**Supplemental Report Number 3:  
Skill Development Rubrics for Core Academic Competencies**

**Critical Thinking Rubric**

This rubric was developed by Rebekah Richert, Tara Yosso, Amy Litt, Robert Clare, and Mariam Salloum with reference to the AAC&U Analytical and Critical Thinking Framework. It represents step-wise goals for students' to develop the skills and abilities to be innovative critical thinkers, with the intention that activities of any given educational experience for students have the guided development of these skills and abilities as a goal.

	<b>Introductory</b>	<b>Intermediate</b>	<b>Innovative</b>
<b>Explanation of Issues</b>	Students state the issue/problem to be considered.	Students state, describe and clarify the issue/problem to be considered, offering context and defining the terms and scope of the issue/problem.	Students state and comprehensively describe the issue/problem to be considered, [offering context and defining the terms and scope of the issue/problem, and] delivering all relevant information necessary for full understanding.
<b>Evidence (Selecting and using information to investigate a point of view or conclusion)</b>	<p>Students present information with an acknowledgement of the methods used to development that information.</p> <p>Students acknowledge that the assertions of experts should be considered in relation to the evidence they present, the context of their statement, and the processes by which the experts reached their conclusion.</p>	<p>Students reference and describe the implications, interpretations, and evaluations of methods used to develop information.</p> <p>Students critique the assertions of experts considering the evidence they present, the context of their statement, and the processes by which the experts reached their conclusion.</p>	<p>Students present information in the context of the methods used to develop that information. Students also will synthesize the implications, interpretations, and evaluations of prior methods into their critical argument.</p> <p>Students critically evaluate the viewpoints of experts, describe how evidence and processes of critical thinking have led an expert to their conclusion, and articulate why and on what basis the expert's viewpoint should or should not be accepted as support for the critical argument. Students will critique the assertions of experts</p>

			considering the evidence they present, the context of their statement, and the processes by which the experts reached their conclusion, and based on that evaluation, determine whether that expert's assertion is supported by evidence.
<b>Influence of context and assumptions</b>	Students identify relevant contexts when presenting a position and demonstrate awareness of own and others' assumptions represented in the stated position.	Students identify their own and others' assumptions and several relevant contexts when presenting a position.	Students thoroughly (systematically and methodically) analyze their own and others' assumptions and carefully evaluate the relevance of contexts when presenting a position.
<b>Student's position (perspective, thesis/ Hypothesis)</b>	Students articulate a specific position (perspective, thesis/hypothesis) and recognize some ways their own position guides information seeking and evaluation of evidence, methods, and arguments.	Students will articulate a specific position (perspective, thesis/hypothesis) that takes into account the complexities of an issue.  Students acknowledge others' points of view within the position (perspective, thesis/hypothesis).	Students will articulate a specific position (perspective, thesis/hypothesis) that is imaginative and creative and takes into account the complexities of an issue.  Students articulate the limits of the specific position (perspective, thesis/hypothesis), including an assessment of how their own goals and assumptions influenced the evidentiary methods and information sources chosen in the development of the critical argument.  Students synthesize others' points of view within their position (perspective, thesis/hypothesis).
<b>Conclusions and related outcomes</b>	Students articulate their conclusions [and make a logical, information-	Students articulate their conclusions and make a logical, information-based	Students articulate their conclusions (and related outcomes) and make a

<b>(implications and consequences)</b>	based argument for their position]. Students also identify some related outcomes, consequences, and implications of their argument.	argument for their position that acknowledges opposing viewpoints and conclusions reached by others. Students clearly identify related outcomes, consequences, and implications of their argument.	logical, information-based argument for their position in ways that reflect the student's informed understanding and evaluation of the strength of the evidence, the influence of bias and assumptions, and how their own position influences their conclusions, as well as by addressing counterpoints to their argument and conclusions.
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## Information Literacy Rubric

This rubric was developed by Rebekah Richert, Tara Yosso, Amy Litt, Robert Clare, and Mariam Salloum with reference to the *Framework for Information Literacy for Higher Education* by the Association of College & Research Libraries (2016). This rubric represents step-wise goals in students' development of the skills and abilities to be proficient in information literacy.

	<b>Introductory</b>	<b>Intermediate</b>	<b>Innovative</b>
<b>Credibility Is Constructed and Contextual</b>	<p>Acknowledge that there are different types of authority granted to individuals, such as subject expertise (e.g., scholarship), societal position (e.g., public office or title), or special experience (e.g., participating in a historic event) and that an individual's authority does not guarantee credibility.</p> <p>Recognize disciplinary practices of establishing credibility of information, including naming authorities, setting "standards" for establishing credibility, validity, and other practices of verifying information accuracy. Recognize scholarly practices of accountability for information, such as process of peer review.</p> <p>Acknowledge that information may be perceived differently based on the context in which it is presented and the format in which it is packaged, including the implications of formats that contain static or dynamic information.</p>	<p>Identify strengths and limitations of the various disciplinary practices of establishing credibility of information ways in and across disciplines.</p> <p>Articulate criteria included in scholarly practices of accountability for information, such as process of peer review.</p> <p>Critically evaluate the credibility of information based on the context in which it is presented and the format in which it is packaged, including the implications of formats that contain static or dynamic information.</p> <p>Demonstrate awareness of the dynamics of audience, context, and purpose as they shape how information is presented and received.</p>	<p>Utilize knowledge of the strengths and limitations of disciplinary practices of establishing credibility in and across disciplines when presenting information.</p> <p>Hold peers accountable using scholarly practices of accountability for information, such as the process of peer review.</p> <p>Demonstrate flexibility in presenting/sharing information to account for dynamics of audience, context, and purpose.</p> <p>Demonstrate the development of their own authoritative voice and embody the responsibilities this entails, including seeking accuracy and reliability, respecting intellectual property, and participating in information sharing and discourse.</p>

	<p>Acknowledge that their perspective and voice can add to the body of information on a particular topic.</p>		
<p><b>The Ways in Which Information is Valued is Socially Constructed</b></p>	<p>Recognizes intellectual property as a legal and social construct and articulates the purpose and distinguishing characteristics of copyright, fair use, open access, and the public domain. Credit the original ideas of others through proper attribution and citation and identifies how individuals bring predispositions and biases to interpreting and placing value on information.</p> <p>Acknowledge issues of access or lack of access to information sources.</p> <p>Identifies ethical practices associated with intellectual property.</p> <p>Acknowledges that some individuals and groups of individuals may be underrepresented or systematically marginalized within the systems that produce and disseminate information.</p> <p>Acknowledges that information possesses several dimensions of value, including as a commodity, as a means of education, as a means</p>	<p>Demonstrates an understanding of the cultural contradictions of knowledge being a collaboration and being claimed as property.</p> <p>Defines and describes ways in which individuals bring predispositions and biases to interpreting and placing value on information.</p> <p>Identifies how predispositions and biases relate to ethics involved in creating, contributing to, and preserving information systems.</p> <p>Describe how and why some individuals and groups of individuals may be underrepresented or systematically marginalized within the systems that produce and disseminate information.</p> <p>Identifies the ethical complications and personal implications of issues related to privacy and commodification of personal information.</p>	<p>Demonstrates reflexivity: an awareness of how they bring predispositions/biases to interpreting and placing value on information.</p> <p>Demonstrates ethical responsibility in creating, contributing to, and preserving information/knowledge systems.</p> <p>Actively seeks and utilizes information from individuals and groups of individuals that have been underrepresented or systematically marginalized within the systems that produce and disseminate information.</p> <p>Decides where and how their information is published and make informed decisions regarding their online actions in full awareness of issues related to privacy and the commodification of personal information.</p>

	to influence, and as a means of negotiation and understanding the world.		
<b>Searching as Strategic Exploration</b>	<p>Acknowledge that the goal of an information search will determine the type and scope of information needed</p> <p>Identify who are producers of knowledge about a given topic and then determine how to access that information. Describe how information systems (i.e., collections of recorded information) are organized in order to access relevant information and match information needs and search strategies to appropriate search tools.</p>	<p>Articulate the type and scope of information needed for a variety of information search goals and across multiple disciplines.</p> <p>Utilizes divergent (e.g., brainstorming) and convergent (e.g., selecting the best source) strategies when searching. Designs and refines needs and search strategies as necessary, based on search results.</p>	<p>Utilize information search strategies that are non-linear and iterative and reflect the understanding of scholarly inquiry as a process of discovery building on previous exploration.</p> <p>Employs skills necessary to engage in this often non-linear process, such as organizing an array of sources, and being flexible to follow alternate sources and analytical approaches as new understandings emerge.</p>
<b>Research as Inquiry</b>	<p>Articulates that research is iterative and depends upon asking increasingly complex or new questions whose answers develop additional questions or lines of inquiry in any field.</p> <p>Acknowledges that existing information on a topic will have gaps and weaknesses</p> <p>Separates a complex problem into simpler, constituent questions that limit the scope of investigation by naming the problem to be addressed/issue to be explored; identifying</p>	<p>Defines ways in which research is iterative and outlines processes for asking increasingly complex or new questions whose answers develop additional questions or lines of inquiry in multiple disciplines.</p> <p>Identifies areas where new information on a problem is needed by naming the problem to be addressed/issue to be explored; identifying sources relevant to exploring the problem/issue; organizing information in meaningful ways; drawing preliminary conclusions about the problem/issue based on</p>	<p>Understands that research is iterative and depends upon asking increasingly complex or new questions whose answers develop additional questions or lines of inquiry in any field.</p> <p>Produces new information/knowledge on a problem by naming the problem to be addressed/issue to be explored; identifying sources relevant to exploring the problem/issue; organizing information in meaningful ways; drawing preliminary conclusions about the problem/issue based on those sources; identifying gaps and weaknesses in existing information;</p>

	sources relevant to exploring the problem/issue; synthesizing information gathered from multiple sources; and drawing preliminary conclusions about the problem/issue based on those sources.	those sources; identifying gaps and weaknesses in existing information; and determining steps to further investigate the problem/issue.	determining steps to further investigate the problem/issue; engaging in further novel investigation; and reflecting on the entire process of naming and exploring sources, steps taken to determine new lines of inquiry, and process of developing new information/knowledge.
<b>Scholarship as Collaboration</b>	<p>Cite the contributing work of others in their own information production and identify the contribution that particular articles, books, and other scholarly pieces make to disciplinary knowledge. Acknowledge that a given scholarly work may not represent the only or even the majority perspective on the issue</p> <p>Identify barriers to entering scholarly conversation via various venues.</p>	<p>Articulates that there is sustained discourse within a community of scholars, researchers, or professionals, with new insights and discoveries occurring over time as a result of competing perspectives and interpretations.</p> <p>Articulate evaluative critiques of others' contributions when engaged in collaborative, scholarly interactions.</p>	<p>Summarize how the changes in a scholarly perspective have developed iteratively, as scholarship builds on the ideas of previous scholarship. Identify some of the continuities, contradictions, and changes across time of scholarly lines of inquiry.</p> <p>Engages in scholarly discourse in a way that positions their scholarly inquiry in conversation with other scholars, noting where their research aims to contribute new knowledge, and where they have identified new lines of inquiry open to further exploration.</p>

## Oral Communications Rubric

This rubric was developed by Amy Litt, Donatella Galella, and Greg Richey based on AAC&U oral communications framework, with numerous modifications and in consultation with Annika Speer. This rubric represents step-wise goals in students' development of the skills and abilities to be proficient in oral communications.

	<b>Introductory</b>	<b>Intermediate</b>	<b>Innovative</b>
<b>Organization</b>	The speech or presentation is organized into a specific introduction, body, and conclusion, and is of an appropriate length. The student demonstrated some preparation of the speech or presentation.	The speech or presentation is well organized into a clear introduction, body, and conclusion with smooth transitions, logical development, and laid out roadmap naming the speaker's purpose and pathway.	The speech or presentation is cohesive and well organized into a clear introduction that grabs attention, body that builds salient points, and memorable summary conclusion with smooth transitions, logical development, and laid out roadmap naming the speaker's purpose and pathway.
<b>Language</b>	The language choices provide some support towards the effectiveness of the presentation.	Language choices are thoughtful and support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Student demonstrates the ability to adjust language for different audiences, purposes, and topics.
<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident, with affect appropriate to the type of speech and topic. Student demonstrates the ability to speak extemporaneously, for instance, to answer questions.

<p><b>Supporting Material</b></p>	<p>Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that support elements of the presentation or establish the presenter's credibility/authority on the topic.</p>	<p>Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/authority on the topic.</p>	<p>A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation and establishes the presenter's credibility/authority on the topic.</p>
<p><b>Central Message</b></p>	<p>Central message is basically understandable.</p>	<p>Central message is clear and consistent with the supporting material and is reinforced appropriately during the talk.</p>	<p>Central message is compelling (precisely stated, appropriately repeated, original, clear, memorable, and strongly supported.)</p>

## Quantitative Reasoning Rubric

This rubric was developed by Richard Cardullo, Robert Clare, Hyle Park, Rebekah Richert, Stefano Vidussi and Steven Brint using a framework adapted from AAC&U. High-quality quantitative reasoning is characterized by the skillful use of the tools provided by mathematical sciences and statistics for the purpose of analyzing quantitative information both in research and daily life.

	<b>Introductory</b>	<b>Intermediate</b>	<b>Innovative</b>
<b>Interpretation</b> Ability to understand and explain quantitative information	<p>Students can extract and explain information presented in mathematical language (e.g., equations, graphs, diagrams, tables)</p> <p>Students can extract and explain quantitative information presented in context (which may or may not be in mathematical form)</p> <p>Students can identify dependent and independent variables, can make logical and qualitative deductions from quantitative information</p>	<p>Students can perform in-context statistical reasoning and understand the concepts of experiments, observational studies, surveys, distributions, means, median, standard deviation, correlation coefficients, hypothesis testing, t-tests</p> <p>Students can evaluate the validity and potential inconsistency in quantitative or mathematical information presented to them, or when such information is misleading (when enumerating only the countable and not the important, data cherry-picking, suppressed zeros)</p>	<p>Students can design methods to obtain relevant mathematical, statistical, or otherwise quantitative information through design of appropriate derivation, experiments, surveys, etc.</p>
<b>Representation</b> Ability to effectively convey relevant information into mathematical form	<p>Students can convert information into mathematical language (e.g., equations, graphs, diagrams, tables)</p>	<p>Students can select and identify an effective choice of mathematical language for a given set of information</p>	<p>Students can select and identify relevant information for conversion into mathematical language</p>
<b>Calculation</b>	<p>Students have command over basic</p>	<p>Students can select and identify an</p>	<p>Students can select, identify, and teach</p>

	<p>mathematical skills: arithmetic, percentages, graphs, estimation, symbolic operations, basic probability and statistics, basic geometry of measurement, and comprehension of basic growth patterns (linear vs exponential)</p>	<p>appropriate set of basic mathematical skills to solve a given problem</p>	<p>themselves an appropriate set of mathematical, statistical, or quantitative skills to solve a given problem</p>
<p><b>Application / Analysis</b> Ability to make judgements and draw appropriate conclusions based on quantitative analysis, while recognizing the limits of this analysis</p>	<p>Students understand conditional and syllogistic reasoning, probability theory, statistical inference, and diagnostic reasoning to information presented in mathematical or quantitative language</p> <p>Students can understand logical reasoning, mathematical and statistical techniques to produce predictions, identify optima (and other critical points), interpolate and extrapolate, and make inferences based on a given set of quantitative or mathematical information</p>	<p>Students can apply quantitative thinking to evaluate claims and information in unfamiliar contexts</p> <p>Students can judge the soundness and accuracy of conclusions derived from quantitative information, recognizing that mathematical and statistical methods have limits</p> <p>Students can discriminate between association and causation</p> <p>Students understand the limitations relevant to appropriate selection and application of mathematical, statistical, and other quantitative techniques and skills</p>	<p>Students can teach themselves adaptable reasoning (the ability to make judgements even in the absence of sufficient information or inconsistent evidence)</p> <p>Students can synthesize and/or create mathematical, quantitative, and other analytic skills and techniques</p>
<p><b>Assumptions</b> Ability to make and evaluate important assumptions in</p>	<p>Students can identify assumptions underlying quantitative or</p>	<p>Students can weigh the validity, relevance, and appropriateness of assumptions</p>	<p>Students can describe an appropriate set of assumptions relevant</p>

<p>estimation, modeling, and data analysis</p>	<p>mathematical information presented to them</p> <p>Students understand differences in scale and magnitude</p>	<p>Students can synthesize estimates to evaluate the reasonableness or validity of analysis of quantitative and mathematical information</p> <p>Students display quantitative intuition: sense of scale, order of magnitude estimates, and appropriate use of heuristics</p> <p>Students can make reasonable estimates of quantitative parameters</p>	<p>to an in-context quantitative question</p> <p>Students can create a model appropriate to an in-context question, and evaluate information acquired through that model</p> <p>Students can describe limitations inherent to the assumptions in estimation, modeling, and data analysis</p>
<p><b>Communication</b> Expressing quantitative evidence in support of the argument or purpose of the work (in terms of what evidence is used and how it is formatted, presented, and contextualized)</p>	<p>Students can understand mathematical information symbolically, visually, numerically, and verbally</p> <p>Students can articulate what they don't understand in mathematical information</p>	<p>Students can identify and select appropriate methods to communicate mathematical or quantitative information</p>	<p>Students can effectively incorporate quantitative evidence of their selection in support of the argument or purpose of the work</p> <p>Students can use mathematical information to create an advanced or novel form of communication in support of their argument or purpose of their work</p>

## Written Communications Rubric

This rubric was developed by Steven Brint and Michelle Raheja, based on the AAC&U written communications rubric, with numerous modifications, and following consultation with Prof. John C. Briggs, Dr. Goldberry Long, and the writing staff at the UC Riverside Academic Resources Center. This rubric represents step-wise goals in students' development of the skills and abilities to be proficient in written communications.

	<b>Beginning</b>	<b>Intermediate</b>	<b>Innovative</b>
<b>Context &amp; Purpose</b>	Demonstrates awareness of context, audience, purpose and assigned tasks. Can address an informal audience to inform about a topic. Student is aware of the different expectations of peers and professional audiences.	Demonstrates adequate consideration of context, audience, and purpose and a clear focus on the assigned task. Can address a class of peers to inform about a topic. Student is beginning to understand how to shape content for different audiences.	Demonstrates a thorough understanding of context, audience, and purpose that is responsive to the assigned task and focuses all elements of the work. Can address a professional audience to inform about a topic. Student can shape content effectively for different audiences.
<b>Content Development</b>	Uses appropriate and relevant content to develop and explore ideas through most of the work. Most paragraphs flow logically and include topic sentences. Transitions are sometimes effective. Student's use of logic and evidence in support of a position is sometimes effective and sometimes less effective. Most writing is based on summary and paraphrasing of others.	Uses appropriate, relevant, and compelling content to explore ideas within the context of the discipline to shape much of the work. All paragraphs flow logically and include topic sentences. Transitions are capably handled. Student shows the capacity to take a position and to defend it effectively with logic and evidence. Student shows capacity to go beyond summary and paraphrasing to develop a distinctive argument that draws on a variety of sources.	Uses appropriate, relevant, and compelling content to illustrate mastery of the subject, conveying the writer's understanding and shaping the whole work. Paragraphs are artfully constructed to convey meaning more effectively. Elegant choices are made about how best to express meaning. Student is capable of using different narrative strategies depending on the intent of the writing. Transitions are handled with style. Student can anticipate objections to an argument and can skillfully rebut them.

<p><b>Genre &amp; Disciplinary Conventions</b></p>	<p>Follows expectations appropriate to a specific discipline and/or writing task for organization, content, and presentation. Begins to make genre distinctions between expository writing, commentary and opinion, satire, and other genres.</p>	<p>Demonstrates consistent use of important conventions for a specific discipline and writing task, including organization, content, presentation, and stylistic choices. Can make accurate genre distinctions between expository writing, commentary and opinion, satire, and other genres. Is beginning to be aware of disciplinary expectations regarding written expression.</p>	<p>Demonstrates detailed attention to and successful execution of a wide range of conventions, particular to a specific writing task, including organization, content, presentation, and stylistic choices. Can employ distinctive genre conventions, including expository writing, lab report, commentary and opinion, satire, and other genres. Is fully aware of disciplinary expectations regarding written expression and can meet them.</p>
<p><b>Sources &amp; Evidence</b></p>	<p>Demonstrates an attempt to use credible and/or relevant sources to support ideas that are appropriate to the discipline and style of writing. Can begin to identify reasons why some sources are more reliable than others. Can begin to identify strengths and flaws in evidence in a piece of writing. Citations will include errors.</p>	<p>Demonstrates a consistent use of credible and relevant sources to support ideas that are appropriate to the discipline and genre of writing. Can identify reasons why some sources are more reliable than others. Can identify strengths and flaws in evidence in a piece of writing. Standard citation practices are followed with few exceptions.</p>	<p>Demonstrates skillful use of high quality, credible, and relevant sources. Can explain in detail why specific sources are preferred as opposed to others. Has expert sense of strength and flaws in evidence in a piece of writing. Standard citation practices are followed.</p>

<b>Control of Syntax &amp; Mechanics</b>	Uses language that generally conveys meaning to readers with clarity, though with some errors in punctuation and spelling. Student is still learning the rules of grammar. Writing includes imprecise word use at times.	Uses straightforward language that conveys meaning to readers with few errors in punctuation and spelling. Student has learned the rules of grammar. Students can produce writing that shows some variety in syntax and vocabulary. Student is gaining capacity to use words precisely. Overall style and voice are cohesive and clear.	Uses graceful language that conveys meaning to readers with clarity and fluency, and contains no errors in punctuation, spelling or grammar. Student has excellent vocabulary that is used precisely. Idiomatic expressions are used effectively to enhance meaning. Overall style and voice are distinctive and capable of arousing the experienced reader's interest.
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