**USC** Dornsife

**BISC 599, section 13599**

**Convergent Biosciences**

**Units: 4.0**

**Spring 9:30 -10:50 am Mondays and Wednesdays**

**Location:** TRF 113

**Instructor:** Raymond C. Stevens, Ph.D.

**Office**: TRF 114B

**Office Hours**: 11:00 –12:00 pm Mondays and Wednesdays

**Contact Info**: [stevens@usc.edu](file:///L%3A%5CUSC%5CAdmin%5CCourse%20syllabi%5CBISC-599%5CConvergent%20Biosciences%5Cstevens%40usc.edu)

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**Course Description**

This course will provide students with a unique transdisciplinary perspective on how the convergence of the Arts, Engineering and Sciences are necessary to enable innovation and to address complex, global problems in healthcare. Working on projects, pitching ideas, and discussions are all major components of the course, which will help students to learn why going beyond boundaries and disciplines is necessary for cutting edge research and futuristic technology development. Invited lecturers are an essential part of this course, as they will provide a variety of opinions from many different fields and perspectives.

**Learning Objectives**

● Students will have a better understanding about the convergence of Arts, Engineering and Sciences, including both how to create interdisciplinary collaborations and how to best utilize the strengths of each field. They will learn from various examples about the importance of these collaborations, not just within one’s own discipline, but across disciplines to expand to engineering, life and physical sciences, and cinematic arts.

● The course will help students learn the necessary skills for initiating and maintaining collaborations via projects and discussions with scientists and artists from both academia and industry.

● Students will understand the importance of the Arts to communicate scientific ideas and their own research in a more effective way.

**Prerequisite(s):** None

**Co-Requisite(s):** None

**Concurrent Enrollment:** None

**Recommended Preparation**: None

**Recommended Readings and Supplementary Materials**

“*The Third Revolution: The Convergence of the Life Sciences, Physical Sciences, and Engineering*”, report from MIT, published in January 2011 and updated in 2016.

Link: [*https://www.cimit.org/images/about/MIT-White-Paper-on-Convergence.pdf*](https://www.cimit.org/images/about/MIT-White-Paper-on-Convergence.pdf)

*http://www.convergencerevolution.net/2016-report/*

**Description and Assessment of Assignments**

**Projects** – Projects will be completed by groups of 2-3 students from distinctly different backgrounds depending on the composition of the student class. Ideally, each group will contain one student each from science, cinema, engineering, business, and/or medicine. The focus of the project presentations is tackling a scientific or societal issue through the convergence of arts, sciences, medicine, and business. Students will gain experience in pitching an idea about some research problem or tech-problem, its scope, feasibility study, potential solutions to the problem, methodology and capability to bring together diverse fields. Projects will be assessed on each of these points.

**Commentary -** The paper/commentary is focused on an important societal issue that can be helped through convergence and communication of the arts and sciences.

**Grading Breakdown**

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| **Assignment** | **Points** | **% of Grade** |
| Participation | 30 pts | 15 % |
| Initial Pitch Idea (Week 3) | 20 pts | 10 % |
| Project Presentations – 1 (Week 8) | 35 pts | 17.5 % |
| Project Presentations – 2(week 15) | 65 pts | 32.5% |
| 1 Journal Page Commentary | 50 pts | 25% |
| **Total** | **200 pts** | **100 %** |

**Grading Scale (Example)**

Course final grades will be determined using the following scale

A 85-100

A- 75-85

B+ 65-75

B 55-65

B- 45-55

C+ 35-45

**Assignment Submission Policy**

Pitching, Project presentations and Invited lectures will be scheduled during regular class timings. (Check schedule for dates).

Paper submission will be done via email or blackboard.

**Course Schedule: A Weekly Breakdown**

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|  |  | **Topics/Daily Activities** | **Readings** |
| Week 1 | 1/9 | Impact of Science and Arts | As assigned |
| 1/11 | Overview of Convergence | As assigned |
| Week 2 | 1/18 | Examples of Convergence | As assigned |
| Week 3 | 1/231/25 | Pitching Ideas for the Future | As assigned |
| As assigned |
| Week 4 | 1/30 | Collaborative Science | As assigned |
| 2/1 | Invited Lecture - Rick Loverd (Director, Science and Entertainment Exchange, Hollywood) | As assigned |
| Week 5 | 2/6 | Team Building Approach to Convergent Biosciences | As assigned |
| 2/8 | Invited Lecture - Arthur Toga (Director, USC Laboratory of Neuroimaging, Director, USC Institute of Neuroimaging and Informatics) | As assigned |
| Week 6 | 2/13 | Communicating Science - Hamed Mirzaei (Founder, Hamed Mirzaei Foundation for Arts and Sciences) | As assigned |
| 2/15 | Invited Lecture - Alex McDowell (Director, USC World BuildingMedia Lab) | As assigned |
| Week 7 | 2/22 | Invited Lecture - Marientina Gotsis (Director, USC Games for Health Initiative; Director, USC Creative Media and Behavioral Health Center) | As assigned |
| Week 8 | 2/273/1 | Project Presentations by all groups – 1 |  |
| Week 9 | 3/6 | Review of Presentations and plans for future presentations |  |
| 3/8 | Invited Lecture - Art Olson (Director, The Scripps Research Institute Molecular Graphics Laboratory) | As assigned |
| Week 10 | 3/20 | Pitching Ideas for Project Presentations 2 |  |
| 3/22 | Invited Lecture - EA Games (Call of Duty) | As assigned |
| Week 11 | 3/27 | Discussion on assignment |  |
| 3/29 | Invited Lecture - Andrew McMahon (Director, Broad Stem Cell Institute) | As assigned |
| Week 12 | 4/3 | Publication Quality Commentary Discussions 1 |  |
| 4/5 | Invited Lecture - Richard Weinberg (Director, USC Computer Animation Laboratory) | As assigned |
| Week 13 | 4/10 | Discussion on assignment |  |
| 4/12 | Invited Lecture - Scott Fraser (Director, USC Translational Imaging Laboratory, USC Director of Science Initiatives) | As assigned |
| Week 14 | 4/17 | Publication Quality Commentary Discussions 2 |  |
| 4/19 | Invited Lecture - MIT Media Lab | As assigned |
| Week 15 | 4/244/26 | Project Presentations by all groups – 2 |  |

**Statement on Academic Conduct and Support Systems**

**Academic Conduct**

Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences.  Please familiarize yourself with the discussion of plagiarism in *SCampus* in Section 11, *Behavior Violating University Standards*<https://scampus.usc.edu/1100-behavior-violating-university-standards-and-appropriate-sanctions/>.  Other forms of academic dishonesty are equally unacceptable.  See additional information in *SCampus* and university policies on scientific misconduct, <http://policy.usc.edu/scientific-misconduct/>.

Discrimination, sexual assault, and harassment are not tolerated by the university.  You are encouraged to report any incidents to the *Office of Equity and Diversity* <http://equity.usc.edu/> or to the *Department of Public Safety* <http://capsnet.usc.edu/department/department-public-safety/online-forms/contact-us>.  This is important for the safety whole USC community.  Another member of the university community – such as a friend, classmate, advisor, or faculty member – can help initiate the report, or can initiate the report on behalf of another person.  *The Center for Women and Men* <http://www.usc.edu/student-affairs/cwm/> provides 24/7 confidential support, and the sexual assault resource center webpage sarc@usc.edu describes reporting options and other resources.

## **Support Systems**

A number of USC’s schools provide support for students who need help with scholarly writing.  Check with your advisor or program staff to find out more.  Students whose primary language is not English should check with the *American Language Institute* <http://dornsife.usc.edu/ali>, which sponsors courses and workshops specifically for international graduate students.  *The Office of Disability Services and Programs* <http://sait.usc.edu/academicsupport/centerprograms/dsp/home_index.html>provides certification for students with disabilities and helps arrange the relevant accommodations.  If an officially  declared emergency makes travel to campus infeasible, *USC Emergency Information* [*http://emergency.usc.edu/*](http://emergency.usc.edu/)will provide safety and other updates, including ways in which instruction will be continued by means of blackboard, teleconferencing, and other technology.