

Resolution to Support On-ramp STEM Courses at Stanford University

Author: Cayla Withers (ASSU 23rd UGS Senator 2022).

Sponsors: Maryam Tsegaye & Sinna Nick (undergraduates), Dr. Paul Mitiguy (Physics/Mechanical Engineering), Emily Schell (GSC Co-Chair), Gurmenjit Bahia (UGS Senator, Faculty Senate Representative), Lawrence Berg (GSC)

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Action Requested: Approval of Stanford ASSU Undergraduate Senate, Graduate Student Council, Faculty Senate

Status Undergraduate Senate: **Passed Unanimously, January 12, 2023** (discussed May 15, 2022)

Status Graduate Student Council: **Passed Unanimously, December 6, 2022** (discussed Nov. 30, 2022)

Status Faculty Senate: **TBD**

Whereas: Stanford is strongly committed to DEI (Diversity, Equity, and Inclusion) initiatives and is actively recruiting highly capable first-generation students.

Whereas: The diverse backgrounds of a significant percentage of incoming students provides new challenges to on-ramp students to a major of their choice, particularly when students arrive from under resourced high schools (e.g., schools without a teacher in physics, or chemistry, or computer science or advanced mathematics) or for students whose prior instruction in a foundational course was significantly sub-optimal.

Whereas: There is a clear and present need to address disparate backgrounds in teaching and learning due to disrupted core instruction in many high schools (e.g., from Covid) and difficult academic and/or other barriers to students attempting to on-board to a major of their choice. For current and rising students, an iterative prototype solution has significantly more positive impact than delayed perfection.

Whereas: Students have systemic barriers to entry to a major of their choosing when they are expected to have foundational knowledge and skill in entry level STEM courses (e.g., Chemistry 31, Physics 41, CS 106A), particularly for entry-level courses populated by students who have 36 to 72 weeks of prior training (e.g., one or two years of prior advanced high school physics, chemistry, CS, advanced math, etc.).

Whereas: STEM students need high quality mathematically-oriented 3+ unit courses in which their assessment is based on effort and progress in developing skills for next-level courses.

Whereas: Academic advisors appreciate fully functional on-ramp STEM courses that are central to Stanford (not external or remedial), and which can be evaluated by individual university departments for appropriate degree progress. An “on-ramp STEM course” is defined as a Stanford course intended for students who are considering a STEM major and who have limited or no training in a course that is naturally part of a STEM major.

Whereas: Academic departments may struggle to fund, resource, and/or commit to on-ramp courses, particularly to serve students who may or may not become majors in that academic department.

Whereas: Stanford departments have prototyped new courses to address the on-ramp to STEM, e.g., Math 18 and Physics 40, 41A, 41E to train students who lacked the 36 to 72 weeks of math or physics preparation of their peers. Progress has been shown via data involving post-course evaluations, student interviews, and success in subsequent courses. Key faculty and staff are highly involved and supportive of DEI initiatives, e.g., the Vice Provost for Undergraduate Education Dr. Sarah Church and the Senior Associate Dean of Humanities Dr. Mary Beth Mudgett.

Therefore be it resolved:

That: We encourage Stanford University to provide reasonable multi-year initial funding specifically designated for on-ramp STEM courses, with funding used exclusively for the design, deployment, and instructors of those courses.

That: We encourage departments who receive initial funding to commit to dedicated multi-year support for their on-ramp STEM course, including, refining, enhancing, and evaluating their course’s effect on student outcomes (e.g., proficiency in next-level courses and freedom in choosing an academic major).

That: We encourage departments that accept on-ramp funding adopt evidence-based pedagogical practices that demonstrate lasting and meaningful impacts on student learning and community and that the departments gather,

report, and respond to student perspectives and feedback. We encourage departments to deploy committed instructors (professors and lecturers) who have demonstrated prior interest and ability in both teaching and student interaction, with courses and instructors evaluated on students' progress in subsequent follow-on courses.

That: We encourage all university departments to consider on-ramp STEM courses for degree-progress, as appropriate to the needs of the individual student and department.

That: We encourage the University to examine the efficacy, funding, and support of on-ramp courses with the goal to evolve as evidenced by the science and data.

That: During the natural evolution of a new initiative, we encourage new funding sources and opportunities to be made available to expand this initiative to additional non-STEM departments and/or for extended purposes, including pre-Frosh and Stanford's digital education initiative.

Note: it is understood that this aspirational **non-binding resolution** may only serve an advisory purpose. For example, the Senate may lack jurisdiction over: funding or budget issues; individual department decisions as to what courses to offer or how they plan/refine courses; or what the university administration may or may not take under advisement.