May 6, 2016

TO: Department Representatives of the Representative Assembly

RE: Update on Four Year Completion Initiative (FYCI) – Completion of Phase 3

Dear Department Representatives:

In my communication on April 18, 2016, I informed you that Phase Two of the Four Year Completion Initiative (FYCI), which identified factors that impede four-year undergraduate degree completion, was nearly complete and that we were moving quickly into Phase 3—a plan of action and implementation. This plan is now complete (see attached).

As you will see, this plan recommends a framework for analysis and action in response to the factors identified by the departments (Phase 1 and 2) as impediments to graduation in four years. This plan will:

- Further assess and quantify the relationship between the identified obstacles and the four-year graduation rate; and
- Identify and pursue actions to improve the four-year graduation rate.

This is a truly collaborative effort, and I would like to thank all who have worked with the Academic Senate to make it possible: the Office of the Vice Provost and Dean, Undergraduate Education; the Chair of Undergraduate Council; the Chair of the Council of Associate Deans; The Registrar; and Budget and Institutional Analysis.

The Academic Senate looks forward to working with the Departments, Faculty, and Administration as we begin to implement this plan of action. In fulfilling your role as Department Representatives to the Representative Assembly, I request that you share and discuss the attached report with the faculty members you represent.

Sincerely,

André Knoesen
Chair, Academic Senate
Professor: Electrical and Computer Engineering

Attachments: Undergraduate Student Progress to Degree: A Plan of Action to Address Obstacles to Four-Year Graduation

Undergraduate Student Progress to Degree
A Plan of Action to Address Obstacles to Four-Year Graduation

Davis Division—Academic Senate
Office of the Vice Provost and Dean—Undergraduate Education
Council of Associate Deans
Budget and Institutional Analysis

In October 2015 the Academic Senate Chair requested that all academic departments involve their faculty in identifying factors that impede four-year undergraduate degree completion for their major programs. Departments were asked to consider factors that may exist at the department, college, or campus level. By March 2016, as requested, departments submitted a wealth of information about factors that they view as impeding timely progress to undergraduate degrees.

Challenge: Establish a Plan for Action to Improve Undergraduate Student Time to Degree and Graduation Rate

This report, prepared under the direction of the Academic Senate Chair, recommends a framework for analysis and action in response to the factors identified by the departments as impediments to graduation in four years. It represents a collaborative effort by the Office of the Vice Provost and Dean, Undergraduate Education; the Chair of Undergraduate Council; the Chair of the Council of Associate Deans; The Registrar; and Budget and Institutional Analysis.

The report recommends a plan to:

- further assess and quantify the relationship between the identified obstacles and the four-year graduation rate; and

- identify and pursue actions to improve the four-year graduation rate.

Proposed Priorities to Guide Action and Analysis

In general terms, the recommended plan is guided by the principle that action and analysis are interdependent and need to proceed in close iteration.

- Priority 1: Identify and enable actions that are most likely to improve retention and graduation rates *in the near term*. Analysis is focused on implementation of actions that have been proven to work, either at UC Davis or elsewhere.

- Priority 2: Concurrent with priority 1 actions, begin or continue analytical work to address obstacles and suggest actions with *intermediate term payoff*; quantify the impact of specific curricular and co-curricular interventions already in progress with the

aim of improving them; implement systems that will provide new data on factors affecting graduation rates and enable new insights (prerequisite enforcement, Degree Works).

- Priority 3: *For the long term*, apply new data and analytical tools from systems currently under development to reconsider and investigate additional identified obstacles.

Proposed Actions and Analysis

Priority 1

Obstacle 1A: Classroom space constraints, including serious limitation of space for labs, studios and discussion sections. Some factors mentioned by the departments include:

- ***students can't find seats in courses they need to advance in their curriculum***

- ***lack of instructional lab space, studio space, and discussion section space is a limiting factor***

Ensuring the availability of courses, instructional labs, study and discussion sections required for regular academic progress is essential to maintaining and extending the recent gains UC Davis has made in its four-year graduation rate. It should be noted that challenges in the availability of classrooms of certain sizes have long been recognized. During consideration of the 2020 initiative, plans were made to address these challenges over time. However, the near-term space constraints will be exacerbated by the unexpectedly steep enrollment growth trajectory that the state has mandated over the coming two years – this coming at a time time when our new classroom construction efforts are one to two years away from fruition.

Capital construction efforts are underway to augment our complement of general use classrooms. For a summary of these capital construction efforts and their medium- to long-term impact on classroom capacity, please see the list of projects, attached. These projects will bring substantial relief starting in 2018-19. In order to bridge the gap over the coming two academic years Undergraduate Education is taking steps to work out arrangements with the deans that will temporarily add additional classroom space. In order to optimize these temporary measures, and prepare to more efficiently use classroom space in the future, the following are proposed:

1. ***Achieve an holistic understanding of critical curricular pathways to four-year graduation, major by major, and understand how specific courses advance or impede these pathways.***

   Students must be able to enroll in required courses in the specific sequence demanded by their major curriculum. It will be necessary to better define the specific required courses that are impeding four-year graduation (ranked by number of students affected). This should be addressed relative to students entering as freshmen, and those entering as transfers, as it may vary across these groups.

Fall 2016 – Spring 2017. While analysis of this issue will be greatly enhanced by coming software tools--Degree Works (Fall 2016) and prerequisite checking (Fall 2017)—important work can begin immediately with the department chairs and faculty to identify the intra- and cross-departmental dependencies that impact critical curricular paths, major by major. This work could be coordinated through focus groups with department chairs to identify what are perceived to be the most critical obstacles, and then through facilitated conversations about options for addressing the identified articulation issues. [UE/Academic Senate/CAD]

2. ***Improve seat demand projection by course and coordination of wait list management. Short-term (Fall 2016 and continuing)***

   April 2016: Analytical effort is underway to assess and inform dialog with the Associate Deans about what specific classes are likely to constitute bottlenecks in Fall 2016. Proposals will be developed to alleviate these projected bottlenecks in preparation for freshman seat release. [BIA/Registrar/CAD]

   July-December 2016: Develop an upper division seat demand prediction model by course, with emphasis on courses that are recognized as bottlenecks (for example, focus on upper division laboratory or studio courses). This will require communication and interaction among associate deans, department chairs, and department/campus space planners. [BIA/Registrar/CAD]

3. ***Improve wait list analysis and management/coordination of wait list response among UE/BIA/Associate Deans/Department Chairs. Short- and medium-term (Fall 2016 and continuing.)***

   May-December 2016: In this matter of organizational discipline and coordination, improved methods to view waitlists and compare them to historical trends will be very important:.

   There are a handful of IT solutions or systems improvements, commissioned by the Academic Senate and the administration, that will help with the four-year graduation rate. These systems will provide students with real-time information on their progress through their curriculum (Degree Works and prerequisites) and faculty with ways to streamline the curriculum and degree requirements (ICMS and transfer equivalency). Below are the implementation timelines:

   - Winter 2016 Transfer Equivalency and campus prerequisite cleanup
   - Spring 2016 New course approval system (ICMS)
   - Fall 2016 Degree Works for students and academic advisors
   - Winter 2017 Prerequisite Checking Pilot #1
   - Spring 2017 Prerequisite Checking Pilot #2 and Placement Exams
   - Fall 2017 Prerequisite Checking Campus

The colleges may need an experienced faculty member or group to regularly review wait lists and work with the associate deans and department chairs to address enrollment problems and leverage these new technologies. Undergraduate Education may need to dedicate program resources to facilitate this effort. [UE/BIA/Registrar/CAD]

4. ***Enable operations analysis of room scheduling and the optimization of schedules subject to multiple constraints.*** Course scheduling could be improved by the use of analytical software that interfaces with the existing course scheduling system to optimize room scheduling subject to multiple constraints (including prerequisites, co-requisites, courses from multiple departments commonly taken together or in a well-defined sequence).

   July 2016 through June 2017: In addition to monitoring waitlists, especially for bottleneck courses, that are available after pass 2 or about a month before the start of the quarter, the campus needs the analytical capacity to model the demand at the course level 3-4 months before the start of the quarter. Departments should know which courses will require additional seats or a larger classroom well in advance. Platinum Analytics (which will combine Degree Works and Ad Astra classroom scheduling data) is being considered by BIA, the Registrar, and UE. This will require participation from associate deans and department chairs to model known bottlenecks and test possible approaches. [UE/BIA/Registrar/CAD]

Obstacle 1B: Students consider factors other than time to completion in planning their course schedules, and may lack sufficient guidance to understand and weigh the consequences. Some factors mentioned by the departments include:

- ***students may take fewer units to optimize their grades***
- ***students take fewer courses/units to keep their schedule academically more flexible for other reasons—work, extracurricular activities, family demands, or because of a desire to enjoy the undergraduate experience***
- ***students make poor (time-costly) course choices—simply bad choices or advising-related issues (not enough advisors, not enough properly trained advisors)***
- ***Students do not have electronic degree planning reports and tools to help guide their curricular choices and pathways***
- ***Students may desire extra (not required) courses in order to obtain breadth in their undergraduate curriculum (e.g., adding language courses).***
- ***Students take time off for academic and/or other reasons (financial, personal)***

These issues must be approached with sensitivity to students' desires and individual circumstances and most likely in multiple stages. For example, many students have to work to pay fees and living expenses and they adjust their academic schedule accordingly. Changes in the University's financial aid and tuition practices may alleviate some of this in the longer term. However, it would seem that the short-term challenge is best addressed by helping such students make the best possible scheduling decisions through advising and co-curricular support. This might involve enhanced expectations/requirements for minimum/cumulative academic progress or more active enforcement of existing

expectations/requirements as well as a culture of required and frequent academic advising in combination with the full adoption of degree audit and planning software across campus (Degreeworks).

These are difficult issues but other UC campuses have addressed them. UC Davis should consult with sister campuses and determine how their practices might inform ours. We must avoid stigmatizing students that are successful but moving more slowly for good reasons to avoid creating self-fulfilling prophecies that inhibit success. We must be careful to avoid sacrificing desirable enrichment activities (study abroad, extended internships, meaningful work experience) to expediency in improving time to degree. UC Irvine and UC Santa Barbara, facing similar challenges, but with integrated student facing degree planning tools, seem to have met the many challenges and have achieved four-year graduation rates in the high 60 percent range. Therefore, we propose:

1. ***Learn what we can about minimum/cumulative progress policies and advising practices from UC Santa Barbara and UC Irvine.***

   Summer and Fall 2016. Discuss ways to improve four-year graduation with the academic and administrative leadership at UCI and UCSB, with a focus on their policies, use of electronic degree planning tools, and advising procedures. Bring appropriate policies and practices to UC Davis for discussion and possible implementation. A concerted, action-oriented partnership between Senate and Administration is required to realize any implementation of new policies or practices. [Academic Senate, UE, Student Affairs, BIA, CAD]

2. ***Assess: Does average number of units taken per quarter affect GPA? Fall 2016 [UE, BIA]***

Obstacle 1C: Additional work is needed to maximize the learning potential of discussion sections.

Fall 2016 – Spring 2017. Engage with department chairs and faculty through focus groups to better understand the variation of departmental practices with respect to discussion sections for large courses. What are the barriers to a pedagogically successful strategy in this regard? Not enough qualified graduate students? Suboptimal resource allocation strategies? Insufficient instructional training for graduate students? In collaboration with the department chairs and associate deans, develop and recommend strategies for improvement. (UE/CAD/Department Chairs).

Priority 2

Obstacle 2A: Students arrive at UC Davis with inadequate preparation for the curricula. Some factors mentioned by the departments include:

- **Students lose time or do not graduate because they lack adequate preparatory math, science, writing and other English communication skills, resulting in poor performance;**

- **Transfer students arrive missing key courses, or do not have enough experience in coursework that is core to their major**

1. ***Assess/quantify/understand impact of workload and ESL courses on freshman graduation rates. Provide information to advisors, chairs, associate deans about prevalence of workload and ESL course taking among their majors.***

   July 2016 – ongoing. Design and execute analysis to understand the correlation of workload and ESL with graduation rate. Determine how many freshman students and what proportion of freshman students participate in these courses, and how much participation in these courses affect graduate rates. Understand the admissions priorities and practices that result in admission of students with workload needs, and study pre-admission and post-admission alternatives to workload for meeting these needs. Such analyses should include review student progress patterns AND collection of insights from student focus groups. This should be done in a praxis loop with program development under item 2, below—the point of this analysis is to guide interventions. CAD, supported by BIA, has already begun this work. [BIA/UE/CAD/Student Affairs]

2. ***Continue to evolve alternative interventions for students with workload needs: Pre-enrollment (summer) academies? Adaptive self-learning (e.g. ALEKS) and similar preparatory systems? Co-curricular interventions (SASC, SA retention initiatives)? Summer strategies for continuing students? If catch up and acceleration are the aim—are we providing the right financial support, the right courses?***

   July 2016 – ongoing. Assure timely communication and interaction among advisors, student services professionals, faculty, and campus analytics personnel to produce guidelines and interventions that help students with workload needs succeed and make timely progress. This collaboration should include planning and design of new programs and evaluation of existing programs. [Student Affairs/UE/BIA].

   Summer 2016 – ongoing. UE has data that lead it to conclude that ALEKS works for chemistry, and ALEKS accordingly will be expanded to full scale for chemistry this summer. Math will begin to experiment with ALEKS this coming summer and fall.

3. ***Develop analytical approaches to identifying obstacles in transfer pathways and partner with practitioners to create approaches to addressing obstacles.***

   July 2016 – June 2017. Pursue Koret/Intel-sponsored study of California Community College to UC pathways for engineering students. UE will develop a generic model for students in other disciplines as part of this work. Continue ongoing work to indentify factors that cause students from some community colleges to do better at UC Davis than students from other community colleges. [UE, Student Affairs, BIA, CAD]

Obstacle 2B: Students need better advising earlier in their undergraduate years; have difficulty navigating the complex academic and non-academic advising structures on campus.

Summer 2016. Review data from L&S mandatory freshman advising to see if it has made a difference in first-year outcomes, particularly for students deemed to be "at risk." We will have to wait to see about a longer-term difference. Review data from College of Engineering and College of Biological Sciences mandatory advising programs. [UE/BIA]

Fall 2016 – Spring 2017: Develop an advising navigational "roadmap" for students utilizing newly implemented and developed tools to assist students in connecting with the appropriate advisors for the appropriate needs. The "roadmap" should stress the need for early engagement with academic advisors for advice about curricular pathways and particular needs for support. It will be very important to count the college and departmental cost of "roadmap" implementation.

Obstacle 2C: Academic difficulty and academic probation.

June 2016-July 2017. Define the factors that may lead to academic probation and develop a predictive tool to identify students likely to have academic difficulty before it happens (Fall 2016—UE has already created a predictive model). Develop early identification and intervention strategies for at-risk students and work with the Academic Senate, the advising community, and Student Affairs to develop acceptable means of early intervention. Assess the impact of academic probation on completion metrics. [UE/Student Affairs/BIA]

Obstacle 2D: Internships and programs abroad could be better integrated into the curriculum, allowing enrichment opportunities for more students while avoiding additional time to degree.

June 2016-July 2018. Define the net impact of these programs on graduation rate and the undergraduate experience, including time to degree, gpa, post-graduation employment and other education outcomes. Such experiences are highly valued by students and faculty, and need not necessarily increase a student's time to degree if appropriately planned and integrated with the curriculum. [UE/Global Affairs/ICC/Student Affairs/BIA/CAD]

Priority 3

Obstacle 3A: Late major changes and late declaration of a second major or minor

June 2016-December 2017. Some initial analytical work has been done by BIA and the CAD on the impact of timing of major declaration—follow up on and complete this work. UE will use its Department Diagnostic Tool to get metrics out to the departments by summer's end.

June 2017-July 2018. Assess whether the timing of declaring a second major or a minor has an impact on completion metrics. Essential to this work is the ability for students to declare minors in the Student Information System so we know who is pursuing a minor (currently students can only declare a minor the term prior to graduation).

Obstacles 3B: Socioeconomic distress and personal circumstances. Circumstances suggested by the departments include:

- **20-plus hours of work**
- **Commuting**
- **Health crises, both physical and mental**
- **Experiences of barriers to social or academic engagement, including experiences of exclusion**

June 2017-July 2018. Continue efforts in Student Affairs and Undergraduate Education to evaluate the effectiveness of co-curricular and other student support programs with respect to time to degree and other metrics of student success. Review data from UCUES and exit surveys to gain further insights from students about co-curricular support needs. [Student Affairs/UE/BIA]

Obstacle 3C: Prerequisite enforcement. Lack of a consistent approach to prerequisite enforcement will be addressed soon by Implementation of a prerequisite enforcement policy and evaluation of the outcome.

The campus advising community and the Academic Senate have identified lack of prerequisite enforcement as a significant issue. The impact on time to degree and dismissal due to unenforced prerequisites and the student behavior that ensues (retaking courses when not adequately prepared, taking a succeeding course with the current course, and so on)—particularly in STEM preparatory coursework—is viewed as significant.

Winter 2017 – Spring 2018. The Academic Senate and the Registrar are in the midst of working with the colleges and departments to establish prerequisite enforcement. An approach will be piloted during Academic Year 2016-17, and campuswide implementation is planned for Fall 2017 After implementation, the impact of this change on time to degree and student success more generally will be evaluated. [UE, Academic Senate; CAD]