UCDAVIS
COLLEGE OF ENGINEERING

COE Annual Faculty Meeting
May 19, 2016

MEETING MINUTES

- UNIVERSITY OF CALIFORNIA, DAVIS
  VOLUME XXXVIII, NO. 3
- ACADEMIC SENATE
- MINUTES (posted to COE Intranet)
- REGULAR MEETING
- FACULTY OF THE COLLEGE OF ENGINEERING (DAVIS)
- May 19, 2016, 3:00 p.m., Room 1065 Kemper Hall

Order of Business

1. Announcements by the President, Janet Napolitano (none)

2. Announcements by the Chair, Mark Grismer

Executive Committee Activities

- Four-Year Initiative Program
- COE Distance Learning Program – Faculty Oversight
- Proposal Regarding Undergraduate Research Units
- Review of Request for Increased Enrollment Targets
- Reviewed Metrics for Distributing Graduate Program Funds
- Review of COE Security Network
- Review of Transfer Pathways for Community College Students

Executive Committee Activities continued…

- Cap on Courses
- Course Materials Fees – 5 renewals, 1 revised
- Two Student Petitions
- Undergraduate Curriculum Changes – BME, CHMS, CS, ECE and MAE
- Numerous Requests for Comment (RFCs) from Senate Office

Order of Business continued…

3. Announcements by Dean, Jennifer S. Curtis
    - Slides to follow

College of Engineering Budget Briefing

Presented to:

Faculty Executive Committee – May 12, 2016
Provost and Executive Vice Chancellor – May 13, 2016
Department Chair – May 18, 2016
Annual Faculty Meeting – May 19, 2016

UCDAVIS COLLEGE OF ENGINEERING

College Overview

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College Overview

- Undergraduate majors: 4,510
  - 40% growth since 2010, ½ of total campus growth has been in COE
  - 1.7% international for Fall 2010; 12.6% international for Fall 2015
  - Strategic targeting of transfer students
    - 20% of entering students in Fall 2015
- Graduate students: 1,099
  - Includes 719 PhD students
  - 41% international
- Senate faculty headcount (Fall 2015): 206
  - 14 new hired to date in 2015-16
  - 12 open recruitments, including 2 LSOE/LPSOE

Data updated May 2016

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Faculty Hiring – 14 hired to date

- Alyssa Panitch, BME, Department Chair
- Mert Sabuncu, BME
- Coleman Kronawitter, CHE
- Priya Shah, CHE
- Roopali Kukreja, MSE
- Holly Oldroyd, CEE
- Maureen Kinyua, CEE, URM
- Alejandro Martinez, CEE, URM
- Alex Forrest, CEE
- Sabbie Miller, CEE, PPFP
- Heather Bischel, CEE
- Srabanti Choudhury, ECE
- Robert Cui, ECE
- Lifeng Lai, ECE

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Robert Cui | *Heather Bischel* | *Srabanti Chowdhury* | *Alex Forrest* | *Maureen Kinyua* | *Coleman Kronawitter* | *Roopali Kukreja*

Sabbie Miller | *Lifeng Lai* | *Alejandro Martinez* | *Holly Oldroyd* | *Alyssa Panitch* | *Mert Sabuncu* | *Priya Shah*

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Faculty Hiring

- 12 new searches in 2016-2017
- 15 searches in 2017-2018
- Startup funds of $3M in 2016-2017
  - Approximate actual cost - $10M
- Startup funds of $3.5M in 2017-2018

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Leadership and Support Investments

- Facilities – Director of Small Projects
- Associate Dean for Facilities and Space
- Director of Safety
- Front Desk Assistant – Dean's Office

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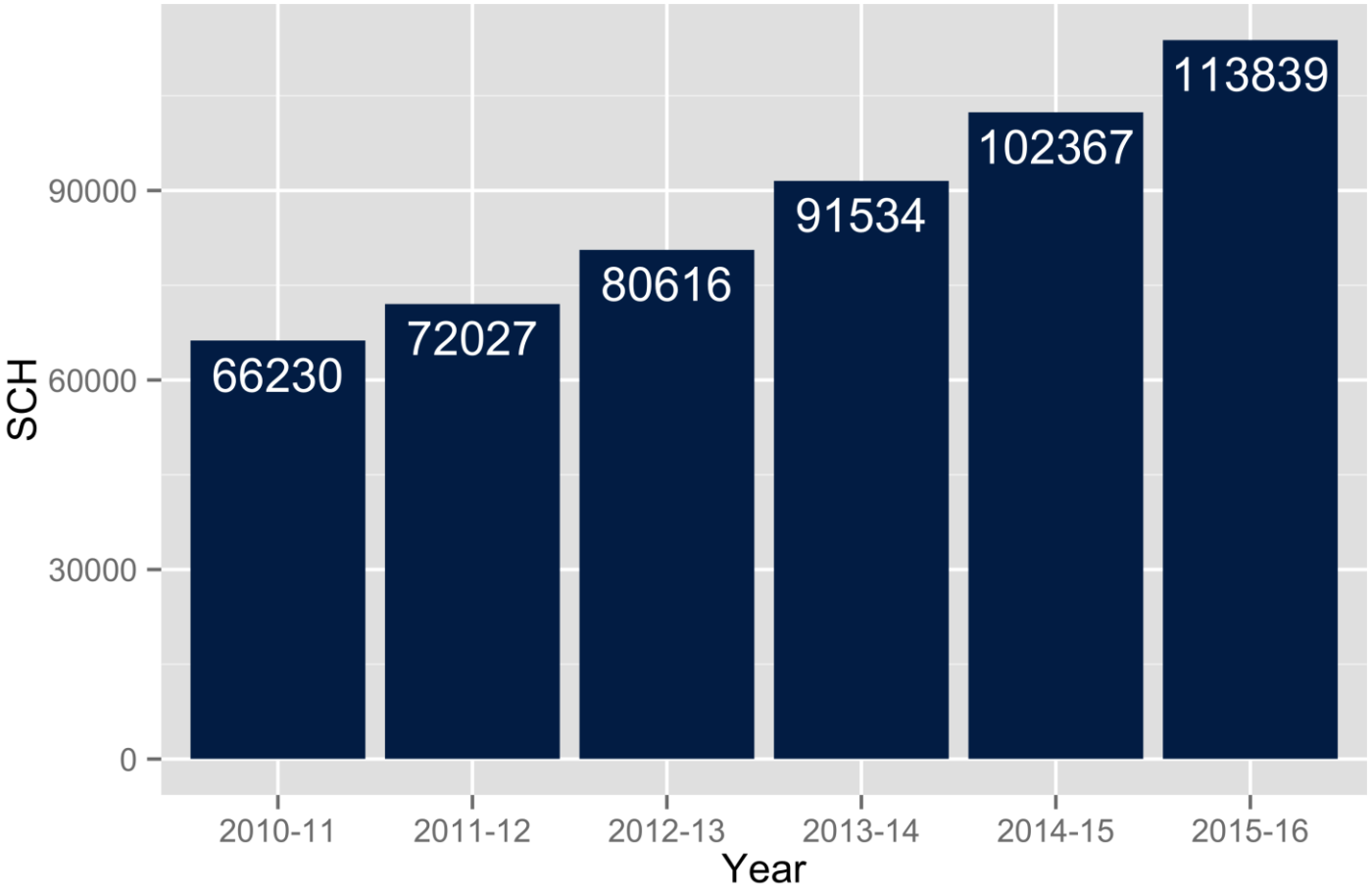
Undergraduate Student Credit Hours



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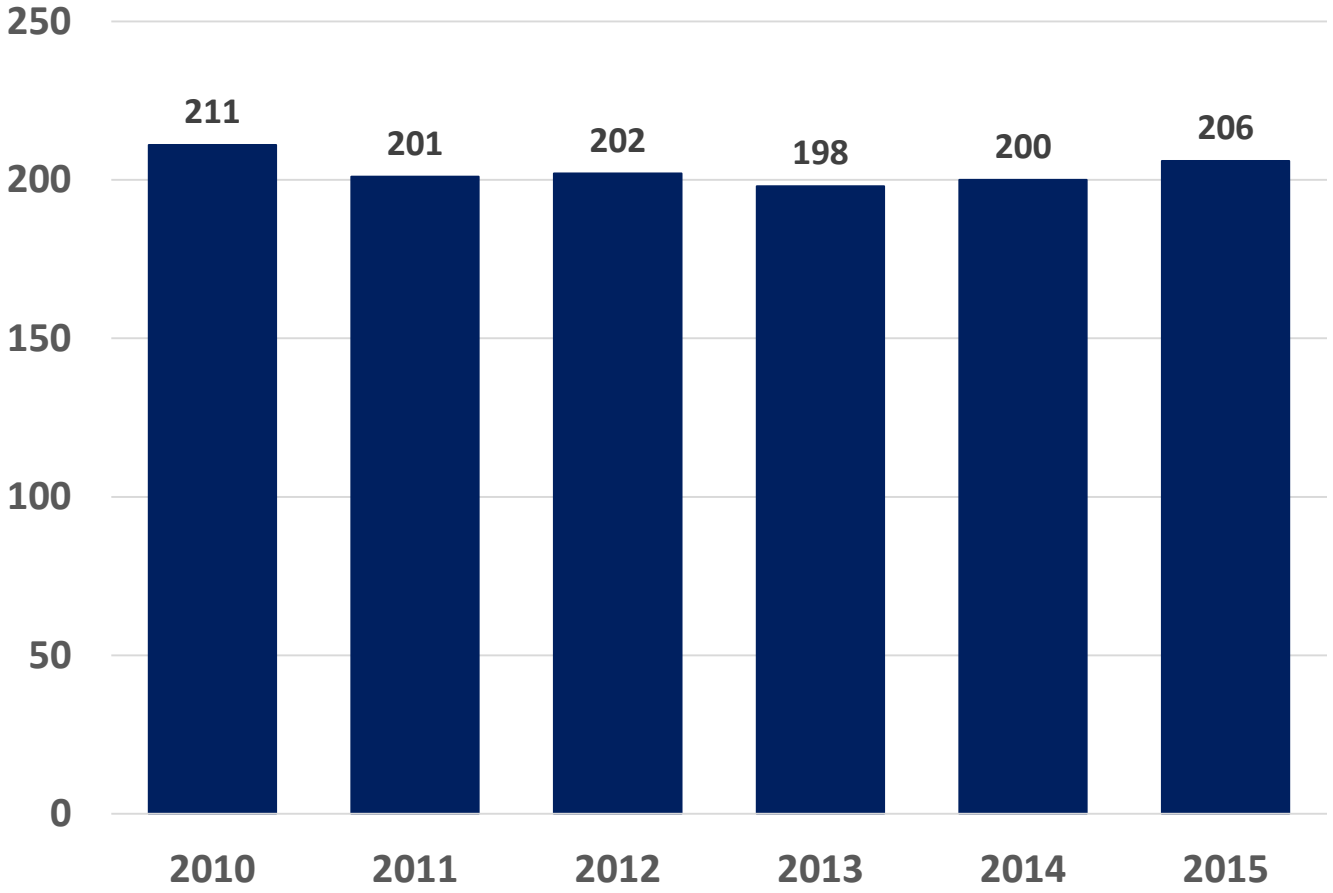
Faculty Head Count



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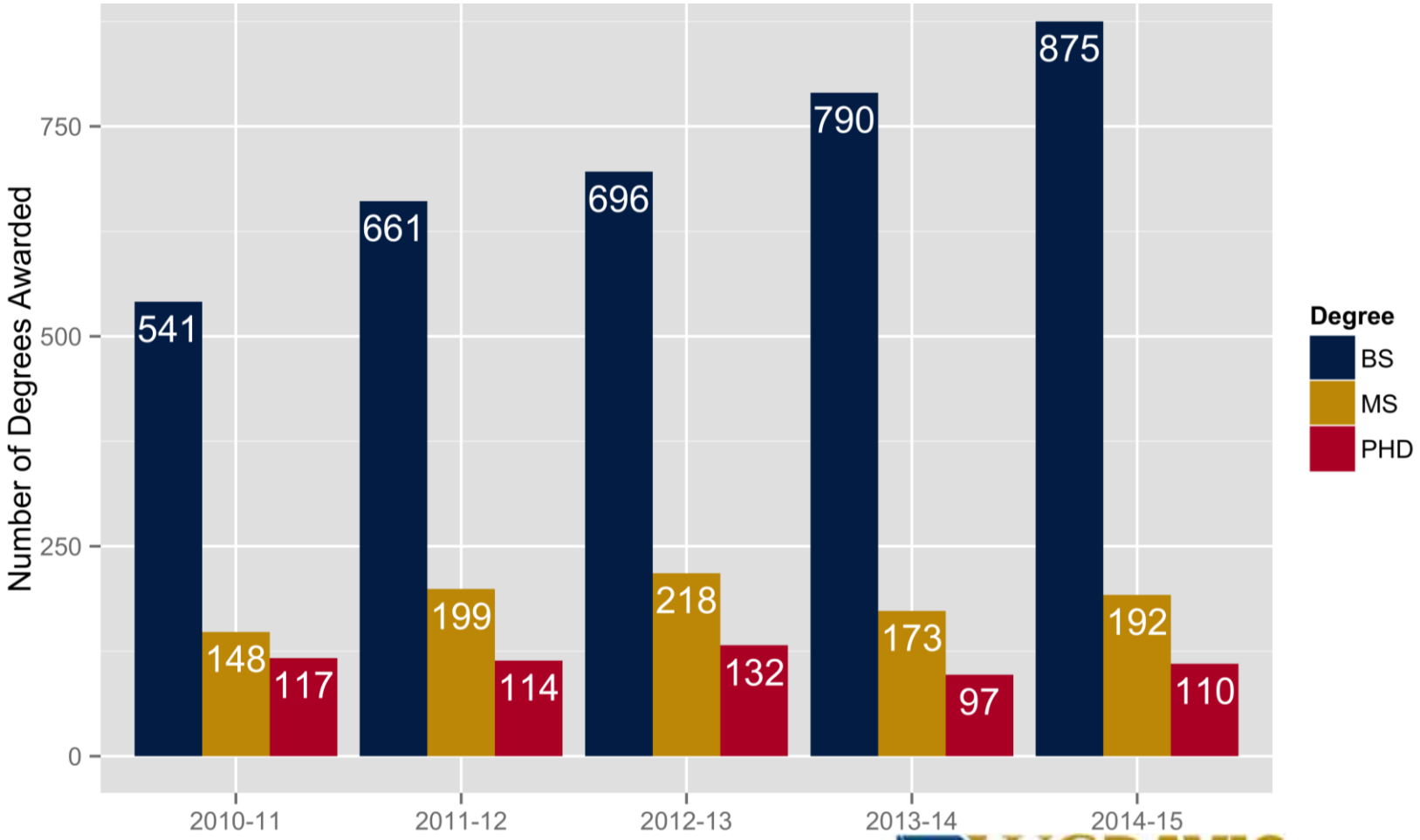
Degrees Awarded



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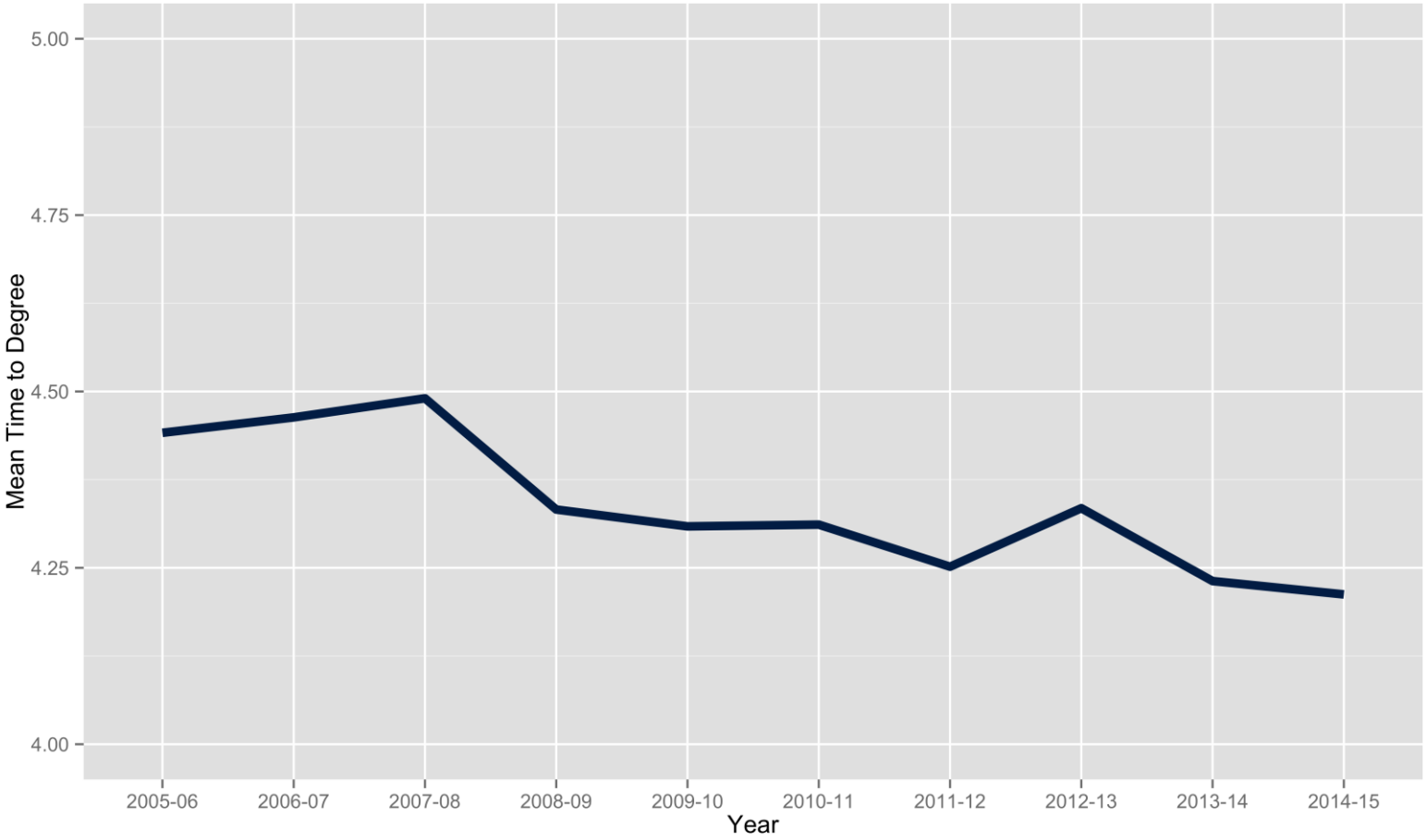
Mean Time to Degree - Freshmen



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Time to Degree

Four years and one quarter

- High number of units to meet degree requirements - meet accreditation standards
- Heavy dependence on prerequisites and the need for students to progress through program in a well-designed fashion
- Lack of preparedness of some of our students
- Changing major into our college can delay graduation
- Some programs offering courses only once a year

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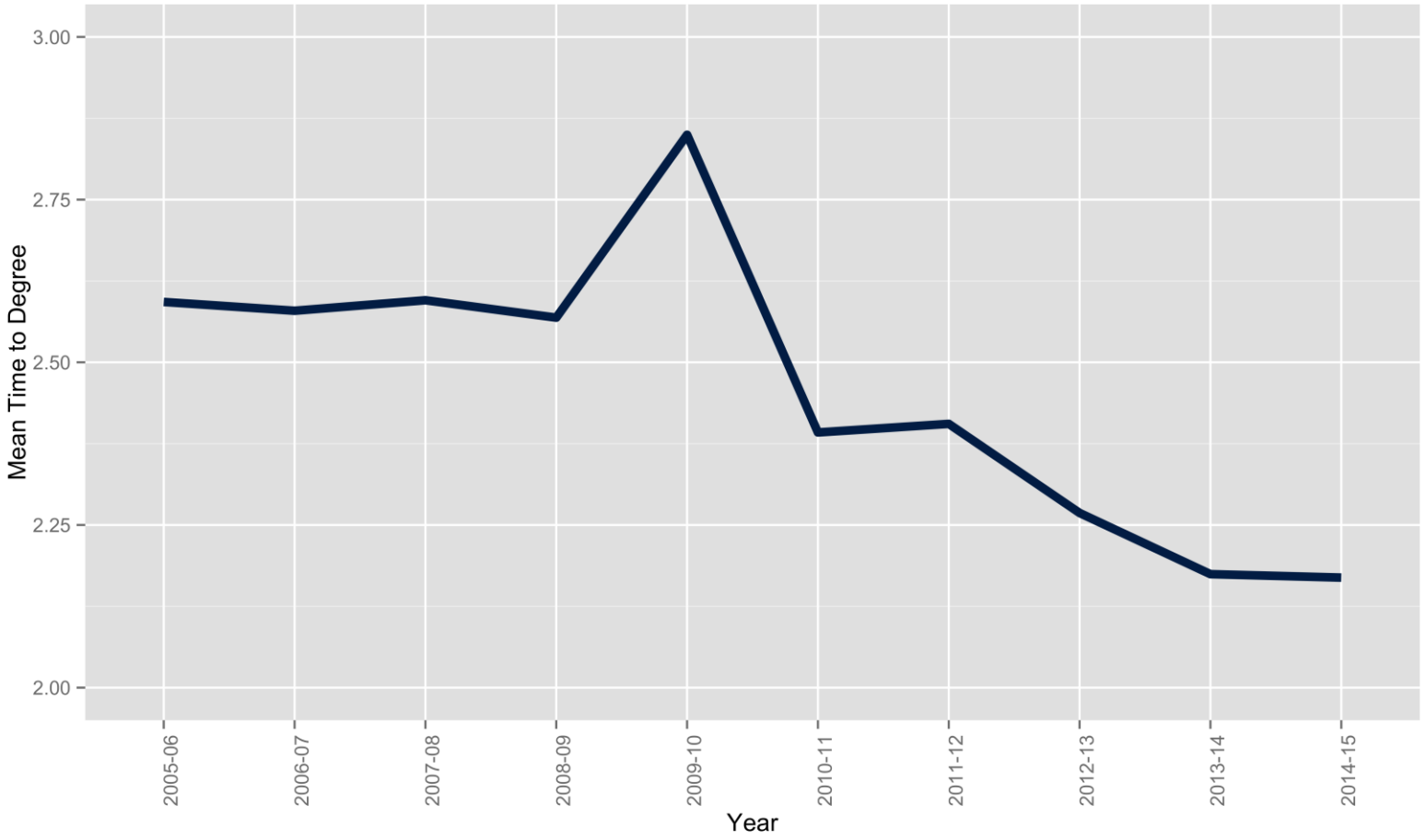
Mean Time to Degree – Transfer



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Diversity

- Diversity at undergraduate levels exceed national average
  - 29% female (20% average) and 23% URM (14% average)
  - Engineering Pathways (Community College) Program
    - $1M Koret Foundation
    - Pending proposals to Chevron and Intel

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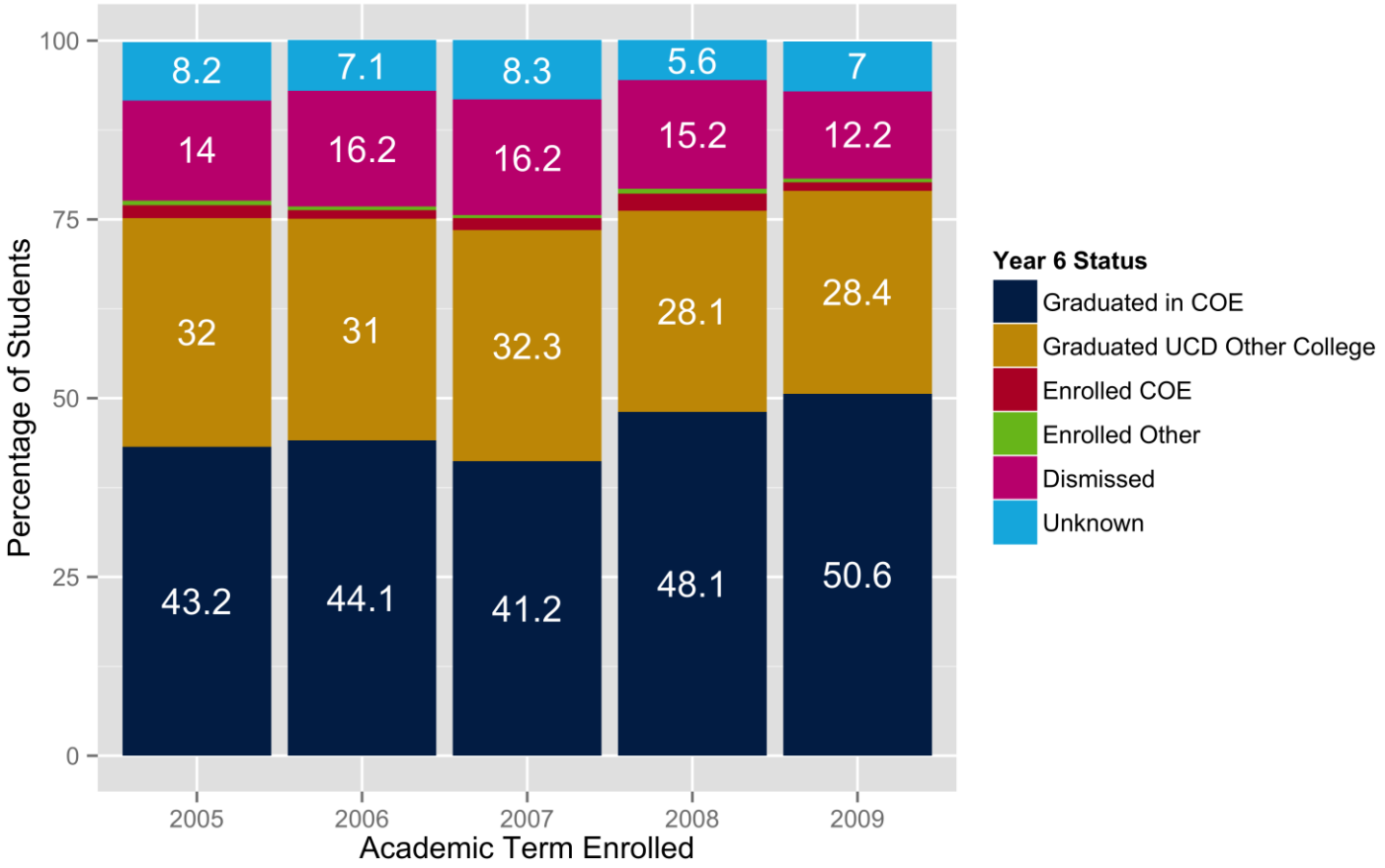
6-Year Freshmen Retention



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Research

- $88M expenditures – up 10% from last year, $83K increase in ICR
- College will hire proposal consultants to assist faculty in preparation of large, center-level proposals
- Currently collecting data (researchers, space, research awards and expenditures) for each faculty researcher for college-wide space audit
- Space is particularly tight in BME - GBSF and Tupper Hall
  - Acting Chancellor Ralph Hexter indicated he will entertain proposal for rental space for BME

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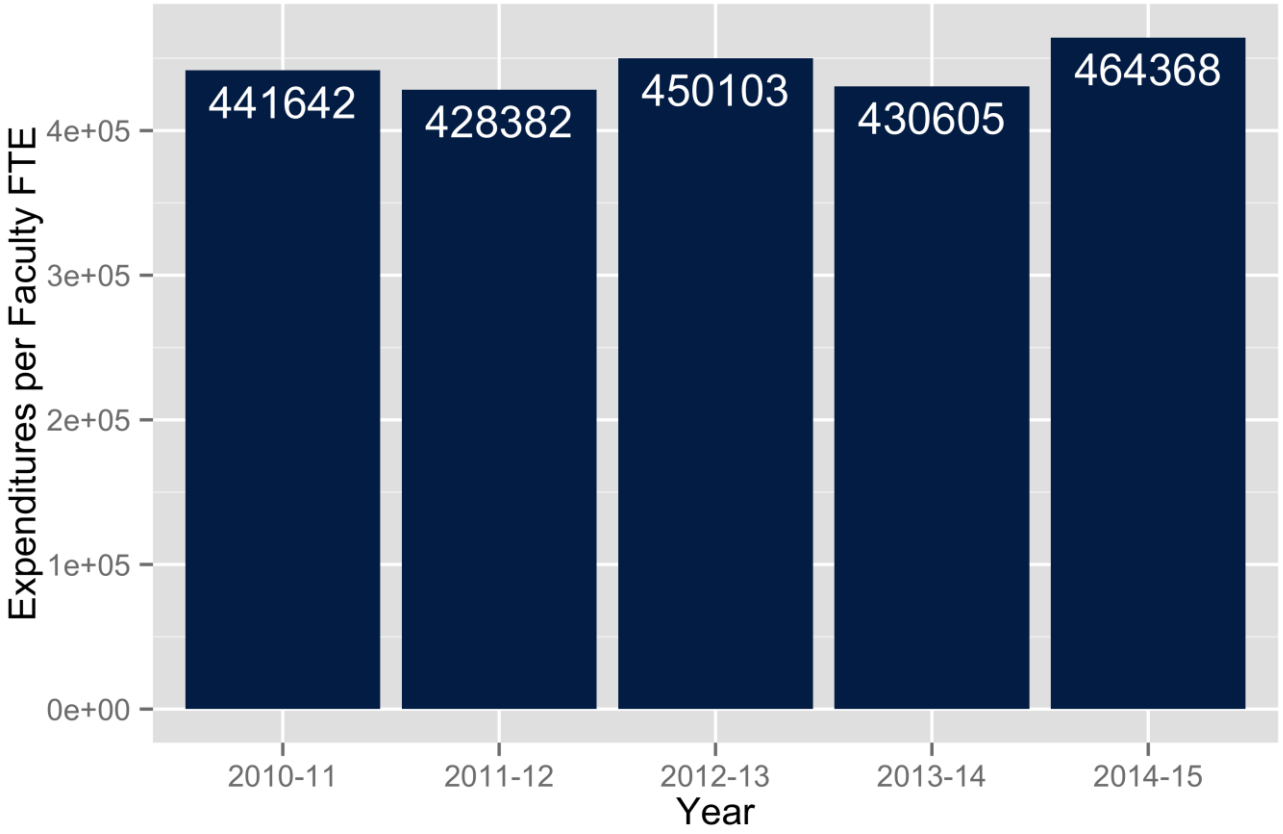
Research Expenditures per Faculty FTE



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Departments

- ABET Review in 2018
  - Engaged a consultant
  - Mock review in 2017
- CHMS Department has split
  - Chemical Engineering
  - Materials Science and Engineering
  - Shared Staff

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Development

- Four current staff
  - Ramsey
  - Wright
  - Gibbs – Corporate giving
  - Tsang – Administrative assistance
- Four open positions – 2 of these are new positions from Dean startup

Development Goals:

- Chaired Professorships and Graduate Fellowships
- Undergraduate Laboratory Upgrades

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Development – Building Projects

- Computational/Data Innovation Center
  - White paper to prospective lead donor
  - Follow up visit in May
  - $50M, 62,500 sq. ft.

- Engineering Student Design Center
  - Instructional lab that supports multiple departments
  - Undergraduate courses, including senior capstone projects
  - Student club team competitions
  - Engineering Student Startup Center
  - Bainer Hall - Expansion from 9000 sq ft to 22,000 sq ft
  - Marketing/communication materials for donor visits
  - Naming opportunities to be finalized

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Strategic Planning

- College-wide strategic planning process in Fall 2016
- Plan will be finalized by Spring 2017
- Plan - visionary but realistic, actionable and measurable
- All college stakeholders will be involved in the strategic planning process
- External strategic planning facilitator will be engaged

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Funding Requests

- Support for CNM2 (Class 100 Electronics Clean Room) upgrade and support for setting up the Growth Lab (MOCVDs) in Spafford
  - Support broader array of campus research programs in electronics, optoelectronics and MEMS fabrication, microfluidics, biomedical devices, and materials research
  - $16.5M total project cost
  - Allocation of up to 10 faculty lines in next several years for faculty who will significantly utilize what will be an outstanding CNM2 and Growth Lab facility
  - Appointed Half-time Faculty Director for CNM2; Hiring two-fulltime development engineers
  - Will submit proposal to be a Campus Core Research Facility
- Allocation of remainder of space in Spafford to COE – rental costs continue to be covered by university
- Rental space for BME – more faculty hires in next several years

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Staff Support

- Explore possible shared service model to improve efficiency (e.g. IT)
- Will be assessing needs for additional department staff to support growth in students and faculty
  - Advisors and grant officers

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Budget Overview

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Carryforward Balances

(excluding FINA accts)

- COE Total: July 1, 2015 = $39.6M
  - Dean's office CF = $11.9M (30%)
    - Obligations: Committed start-ups = $6.1M (existing hires)
    - Obligations: Committed retentions = $1.1M
    - Obligations: Kemper rewiring project= $350K
    - Commitment: research (proposed) cost sharing = $600K
    - Engineering Student Design Center (formerly - Engineering Fabrication lab) project= $1M (2nd and final year of $2.5M investment)
  - Departmental accounts CF = $9.3M (23%)
    - Obligations: $4.0M - $6.0M (estimate range)
    - Committed start-ups, recruitments, grad students, equipment, renovations

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Carryforward Balances

(excluding FINA accts)

- Faculty accounts CF = $18.4M (47%)
  - Salary cost recovery on grants
  - Summer teaching compensation directed to research
  - Start-up funds (recent offer letters allows three years); retentions
  - Administrative provisions; awards

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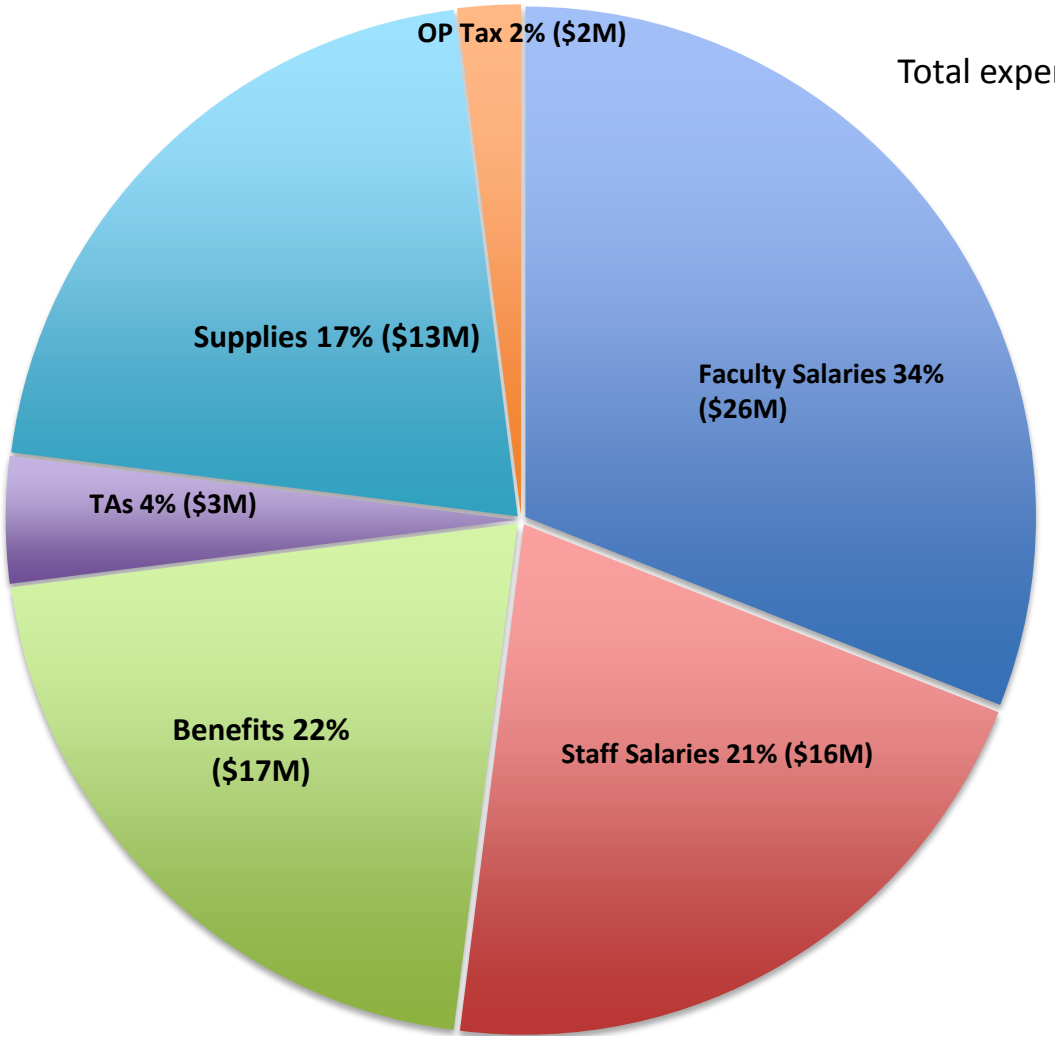
COE Operational Budget 2016-17

Unrestricted Funds



Total expenditures = $77M

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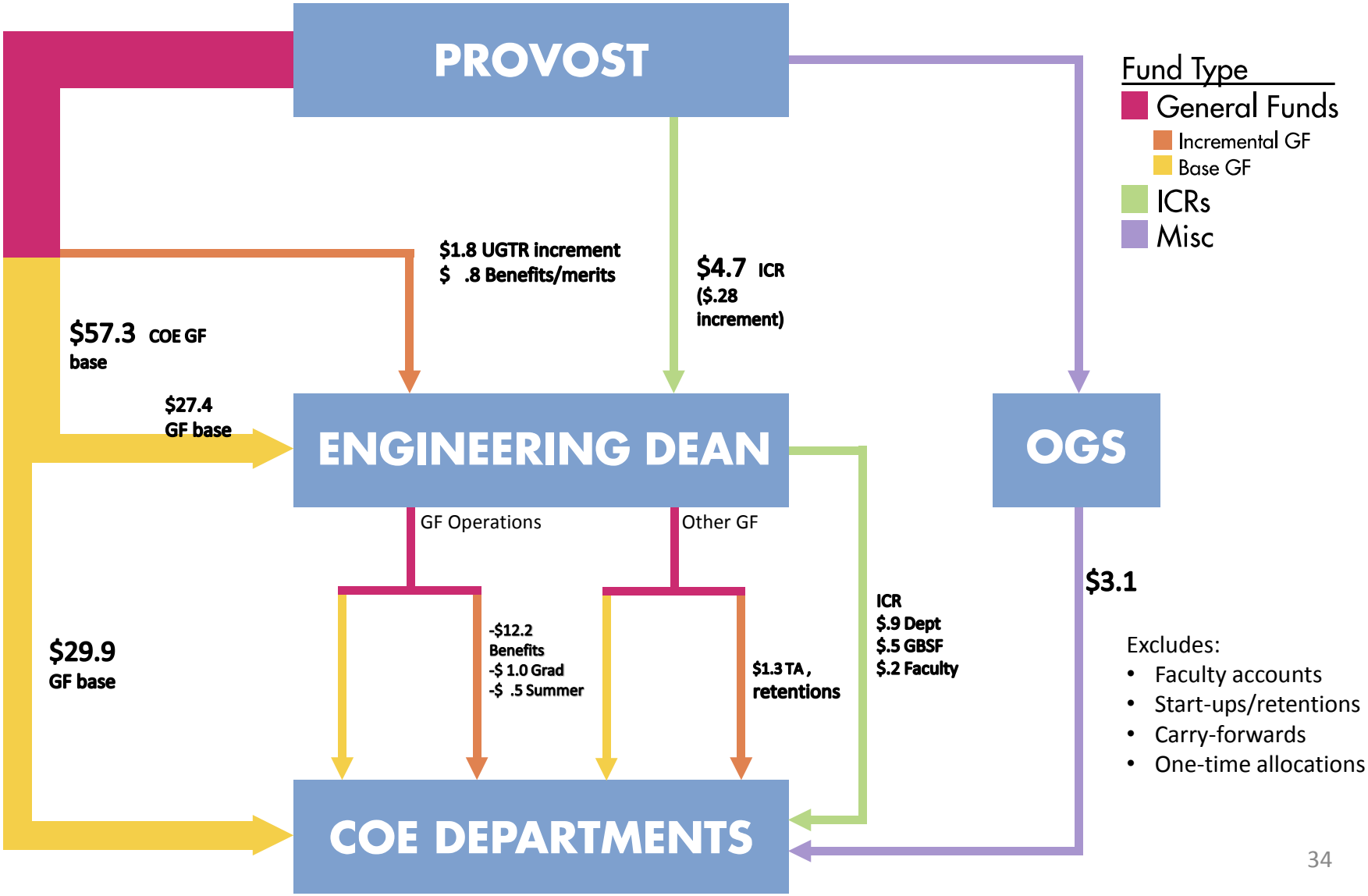
COE Major Flows of Funds, 2016-17

($ Millions)



Excludes:

- Faculty accounts
- Start-ups/retentions
- Carry-forwards
- One-time allocations

2016-17 Proposed Budget

- Strategic Changes
  1. New COE policy of transferring startups commitments up upfront ($6.1M as of today) to home department of faculty member. This will reduce overall workload within COE but no net change to carry forward. Plan in place to provide oversight.
  2. Chemical and Material Science has split (financially effective 7/1/16) to create Chemical Engineering and Materials Science and Engineering.
  3. Budget for each Dean's Office unit will be created. New organization chart within the financial system (see slide below) will improve efficiency and effectiveness in reporting.
  4. Dean and assistant dean will meet with each department to discuss their budget in detail by December 2016.

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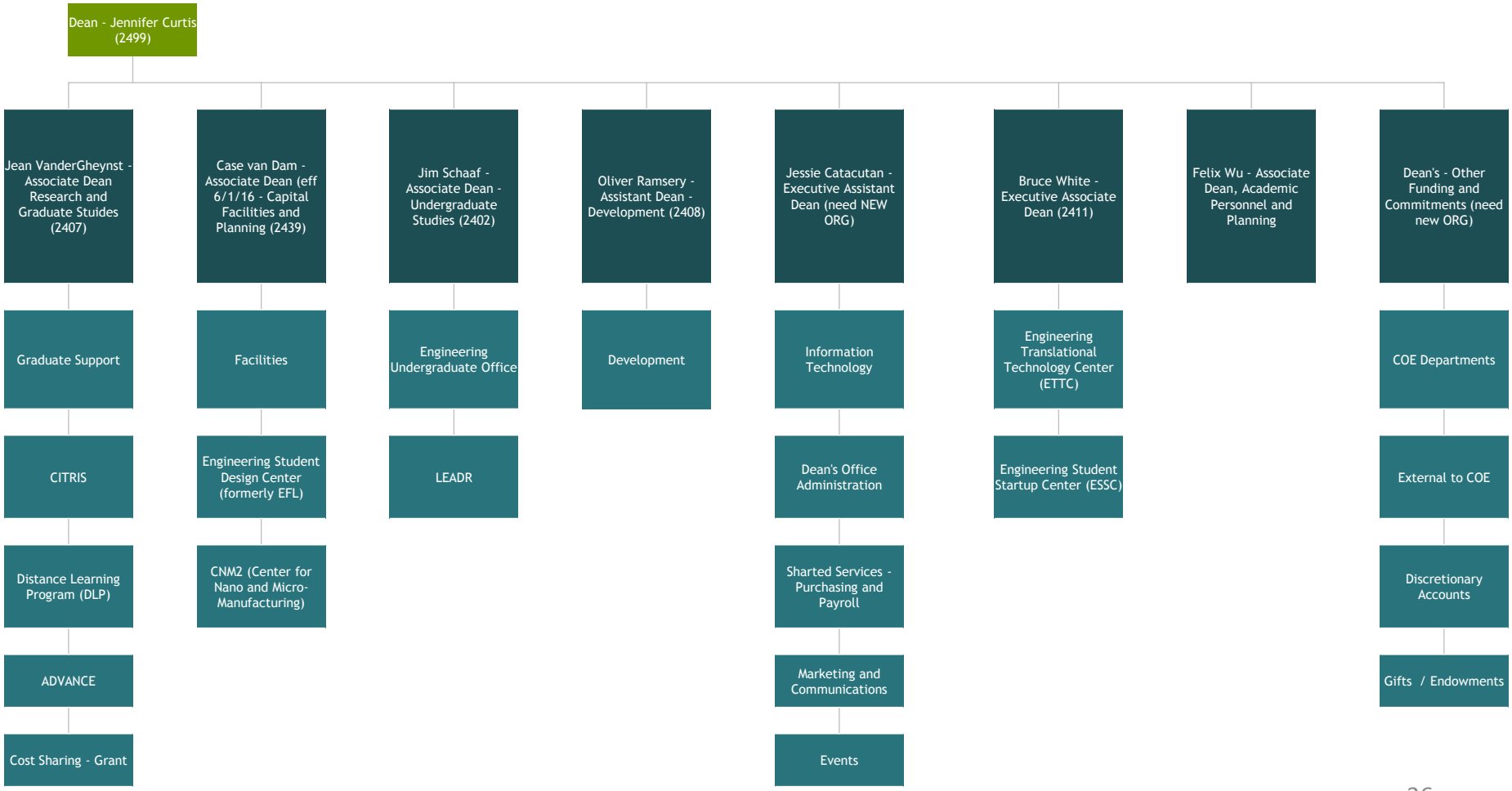
College of Engineering

(As of 7/1/16)

Financial Organization Chart



2016-17 Proposed Budget

- Deficits - CNM2 annual subsidy of $761K (FY 16-17). (excludes campus investment of $16.5M)|

- Projected general fund balance decrease of $365K and ICR balance of $843K but overall carry forward increase of $704K. We are projecting $1.8M surplus from All Other Funds (mostly from gifts and endowments and also from patent and UNEX income).

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Investments

- Use of New/Increased Sources from UGTR tuition of $1.845M

  1. Increase in TA allocation of $270K,
  2. Startups totaling $1.540M for up to 16 new hires
  3. New faculty support $35K

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Investments

- Use of $280K increase in ICR.
  1. Increase of OP tax = $79K (total OP for COE = $1.626M)
  2. Prior year NSF deficit of $100K (funding year 2 of 5 in FY 16-17)
  3. Startups totaling $102K for up to 16 new hires

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One-Time Investments (from carry forward funds)

- Engineering Student Design Center (formerly Engineering Fabrication Lab – EFL) investment of $1M (2nd and final commitment totaling $2.5M
- Dean's Office relocation and renovation $450K (several units) including Academic Surge and Kemper Hall. Free up lab space in Kemper Hall.
- Cloud computing $168K and Kemper rewiring of $350K
- $2M would be COE's normal funding of transferring startup commitments to departments for FY 16-17 if we don't transfer $6.1M by June 2016
- $1.82M is COE's estimate for existing faculty spending from their startup accounts in FY 16-17
- $820K total retention commitment – existing and new

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Closing Comments

- We have increased student growth and retention in the COE and diversity.
- We have increased faculty numbers to meet demands for teaching and research.
- We have increased faculty diversity.
- We are raising funds to meet the needs for infrastructure and education.

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New Faculty since July 1, 2015

Juliana de Moura Bell – BAE

Alyssa Panitch – BME (new Department Chair)

Jamal Lewis – BME

Mert Sabuncu – BME

Colleen Bronner, LPSOE – CEE

Alexander Forrest – CEE

Jonathan Herman – CEE

Holly Oldroyd – CEE

Maureen Kinyua – CEE

New Faculty since July 1, 2015 continued…

Sarah (Sabbie) Miller – CEE

Heather Bischel – CEE

Alejandro Martinez – CEE

Katerina Ziotopoulou – CEE

Veronica Morales – CEE

Coleman Kronawitter – ChE

Jason White, LPSOE – ChE

Priya Shah – ChE

David Doty – CS

New Faculty since July 1, 2015 continued…

Kurt Eiselt, LSOE – CS

Cho-Jui Hsieh – CS/Statistics (home department)

Lifeng Lai – ECE

Srabanti Chowdhury – ECE

Robert Cui – ECE

Seongkyu Lee – MAE

Jason Moore, LPSOE – MAE

Roopali Kukreja – MSE

Susan Gentry, LPSOE – MSE

Faculty Searches in Progress

- Irrigation/Water Mgmt Engineering – BAE/CAES
- Mechanization and Robotics – BAE/ MAE
- Instructional Innovation (LPSOE) – BAE
- MRI Imaging – BME
- Instructional Innovation (LPSOE) – ECE
- MM-Wave/TeraHertz – ECE
- Systems – ECE
- Brain/Computer Interface – BME/MAE
- Databases – CS
- Natural Language Processing – CS
- Higher Performance/Distributed Computing - CS

Reports from Standing Committees

Committee on Graduate Study
Shrini Upadhyaya, Chair
Presented by: Chris Cappa

Committee on Student Recruitment, Development, and Welfare
Erkin Seker, Chair

Committee on Undergraduate Educational Policy
Ben Shaw, Chair

Reports from Standing Committees continued…

Awards Committee
Karl Levitt, Chair

Committee on Information Technology and Innovation Services
Mike Kleeman, Chair

Research and Library Committee
Saif Islam, Chair

Order of Business continued…

4. Special orders (none)

5. Petitions of students (none)

6. Unfinished business (none)

7. New business (none)

COE Standing Committees 2016/17

EXECUTIVE COMMITTEE

Ken Giles	BAE
Scott Simon	BME
Greg Miller	ChE
Jason DeJong	CEE
Zhendong Su	CS
Anh-Vu Pham, Chair	ECE
Nesrin Sarigul-Klijn	MAE
Jeff Gibeling	MSE

COE Standing Committees 2016/17

COMMITTEE ON STUDENT RECRUITMENT, DEVELOPMENT & WELFARE

Julia Fan	BAE
Marc Facciotti	BME
Jason White	ChE
Dawn Cheng	CEE
Norm Matloff	CS
Josh Hihath	ECE
Barbara Linke	MAE
Susan Gentry	MSE

COE Standing Committees 2016/17

COMMITTEE ON UNDERGRADUATE EDUCATIONAL POLICY

Tina Jeoh	BAE
Tony Passerini	BME
Nael El-Farra	ChE
Jeannie Darby	CEE
Phil Rogaway	CS
TBD	ECE
Ben Shaw	MAE
Denise Krol	MSE

COE Standing Committees 2016/17

AWARDS COMMITTEE

Jean VanderGheynst	BAE
Simon Cherry	BME
Spyros Tseregounis	ChE
Michael Zhang	CEE
Karl Levitt	CS
Jerry Woodall	ECE
Vinod Narayanan	MAE
Denise Krol	MSE

COE Standing Committees 2016/17

RESEARCH & LIBRARY COMMITTEE

Stavros Vougioukas	BAE
Angie Louie	BME
Bill Ristenpart	ChE
Boris Jeremic	CEE
Yong Jae Lee	CS
Jane Gu	ECE
Masa Soshi	MAE
Susan Gentry	MSE

COE Standing Committees 2016/17

COMMITTEE ON GRADUATE STUDY

Niels Jensen	DAS
Shrini Upadhyaya	BAE
Kent Leach	BME
Ahmet Palazoglu	ChE
Chris Cappa	CEE
John Harvey	TTP
Kwan-Liu Ma	CS
Raj Amirtharajah	ECE
Roger Davis	MAE
Yayoi Takamura	MSE

COE Standing Committees 2016/17

COMMITTEE FOR INFORMATION TECHNOLOGY & INNOVATION SERVICES

David Slaughter	BAE
Yong Duan	BME
Roland Faller	ChE
Michael Kleeman	CEE
Matt Bishop	CS
John Owens	ECE
Seongkyu Lee	MAE
Klaus van Benthem	MSE

Meeting Minutes

- Annual Faculty meeting began at 3:10 p.m. and adjourned at 4:50 p.m.
- 36 COE Faculty members attended the meeting.

Graduate Study Committee

Report to the Faculty

AY 2015-2016

Committee Members: Raj Amitharajah, Roger Davis, Susan Handy, Niels Jensen, Kent Leach, Chris Cappa, Kwan-Liu Ma, Yayoi Takamura, Shrini Upadhyaya (Chair), Jean VanderGheynst (*ex-officio*).

The Graduate Study Committee met and discussed the following items:

USNWR Ranking: Received information from Amy Smith on elements of the USNWR rankings. (Appendix A)

Graduate Program Fellowship Allocation metrics The committed discussed the impacts of the incentive-based budget model and drafted a letter to the Faculty Executive Committee. Concerns were expressed about the potential for unforeseen bias against engineering students with the current GPFA metrics and requested this issue be brought to the attention of Graduate Council. (Appendix B)

MS Pilot Funds Allocation: The committee recommended a continuation of prior years' allocation method for MS Pilot funds ($608,000). Dean Curtis approved this allocation model for 2015-16 and 2016-17 but charged the committee to provide advice and counsel about guidelines for allocation of these funds beginning in 2017-18 in a manner that benefits all graduate programs in the College. (Appendix C)

Filing Fee Status Forms: Programs may now decide if they wish to require the CoE Filing Fee Status form. Biological Systems Engineering has opted to no longer require the form. Graduate Studies asks that they be notified when a program opts out of the requirement.

Report on Graduate Enrollment Statistics: Four-year summary of enrollment statistics. (Appendix D)

Graduate Council Time to Degree Policy: Doctoral students will have four calendar years after the date they pass their qualifying examination to submit their dissertation. The clock is "set" from the date of passage of the Qualifying Examination, not the time the student officially advances to candidacy through submission of the form to Graduate Studies. This prevents a student from delaying submission of the form to Graduate Studies when they have, in fact, advanced.

Distance Learning Program Received a presentation about the Distance Learning Program (DLP). Committee members were asked to solicit feedback from program faculty about the value of the DLP. Feedback was positive and no negatives were expressed. (Appendix E)

Designated Emphasis in Engineering Education: A proposal for a new Designated Emphasis in Engineering Education was introduced. The proposal is out for feedback and approval from the faculty. (Appendix F)

Graduate Student Admissions Survey. Examined 2015 Graduate Admissions survey and recommended changes for the 2016 survey. In 2016 the survey will be administered in May and July. (Appendix G)

Appendix A:
USNWR rankings weighted components

US News Ranking Categories

US News Weight	College of Engineering Criteria	ANNUAL DATA 2014	2013	2012	2011	2010	2009
	Ranking	33	31	33	31	31	32
	Overall Score	52	51	50	52	52	52
25%	Peer Assessment (1-5)	3.4	3.5	3.4	3.4	3.4	3.5
15%	Recruiter Assessment (1-5)	3.7	3.8	3.7	3.6	3.7	3.7
15%	Total Expenditures (millions)	73.5	$78.3	$74.2	$79.5	$87.1	$86.3
10%	Expenditures/faculty (thousands)	417.8	$434.9	$414.3	$422.7	$448.9	$461.6
7.50%	FT PHD Student Faculty Ratio	4.2	4.1	4.3	4.4	4.2	4.1
7.50%	Faculty NAE members (% of FT)	6.3	6.8%	6.6%	6.7%	6.4%	5.7%
6.75%	Mean GRE Quantitative*	162	163	161	758	746	749
6.25%	Doctoral Degrees Awarded	97	132	114	117	103	99
3.75%	FT MS Student Faculty Ratio	2.4	2.1	1.9	2.3	1.8	1.6
2.25%	Admissions Acceptance Rate	21.2	24.2%	22.2%	24.4%	28.8%	29.4%

Appendix B:
GPFA Metrics letter to Faculty Executive Committee

December 10, 2015

TO: Mark Grismer, Chair
Faculty Executive Committee
College of Engineering

FR: Shrinivas Upadhyaya, Chair
Graduate Studies Committee
College of Engineering

RE: The use of performance-based metrics in disbursing GPFA funds

Starting in AY15-16, a portion of the GPFA funds disbursed to programs is determined using performance-based metrics. These metrics include the following:

- 2-year completion rate for MS degrees
- Advancement to candidacy within 3 years
- 6-year completion rate for PhD degrees

In all instances, these normative times are calculated based on the first quarter of enrollment of a given student. This puts many programs within the College of Engineering at a disadvantage for academically-legitimate reasons. As a few examples:

1. Within CoE, it is exceptionally common for students who are working towards their PhD to get a "MS along the way" within either their home program or within another CoE program. The time at which students do so is highly variable, and not necessarily linked to the actual time of completion of the MS degree requirements. This artificially pushes up the 2-year MS completion rate for many CoE programs. The metric as implemented by Graduate Studies creates a disincentive for programs to allow students to take advantage of this opportunity. This is especially the case as it relates to allowing students doing PhDs in one program to obtain an MS degree in other programs.
2. Many CoE programs allow students to do either an exam-based MS or a thesis-based MS. Students doing a thesis-based MS degree often choose to extend their time to degree to take advantage of the research opportunities afforded to them. By using the same metric for exam-based MS students as for thesis-based MS creates a disincentive for programs to offer meaningful research opportunities to MS students.
3. In an effort to embody the University's value of interdisciplinary collaboration, some CoE programs encourage students who did not matriculate with a BS degree in an engineering field to enroll in their program. Such programs typically require that these students complete additional prerequisite courses that are separate from the primary MS course requirements. The metric in place regarding the MS completion rate creates a disincentive for such programs to allow students with non-engineering backgrounds to enroll in their program, possibly negatively impacting program diversity.
4. Many students enrolled in CoE programs begin graduate school intending to obtain a terminal MS degree, but subsequently decide to pursue a PhD. Often, these students have not planned

they are able to take their QE and advance to candidacy. For many of these students, it is not feasible to advance to candidacy within three years of their original admission date. The metric in place regarding PhD completion rates creates a disincentive for programs to allow students to transition from MS to PhD within their programs and incentivizes bringing in students who have obtained MS degrees at other institutions.

5. Many CoE programs have course requirements that exceed greatly those in other programs. If a PhD student wishes to engage in meaningful research before finishing course requirements, this necessitates that he/she take fewer courses per quarter so as to make time for research activities. The metric in place regarding time to advancement to candidacy creates a disincentive for students to begin research at an earlier stage in their academic career. Additionally, the metric implicitly favors programs with fewer course requirements.

For the above reasons, many programs in CoE appear to perform poorly with respect to the metrics in place. This is illustrated in Fig. 1 below (from here). However, it is apparent that this is a consequence of the way in which the metrics are calculated and not an accurate reflection of CoE programs quality or performance. Graduate Studies has indicated that the use of first enrollment date as the start point is more a matter of convenience than a matter of best practice. Although the idea of using performance-based metrics to apportion some percentage of the GPFA funds is laudable, the metrics must be calculated in such a way that particular programs are not adversely affected for legitimate academic reasons. Furthermore, the metrics should be calculated in a way that promotes the positive academic practices that encourage meaningful student success. As one example, programs should not be penalized if students choose to leave prior to completing their degree due to career-based opportunities, as occurs, for example, regularly in fields for which Silicon Valley is a draw. Nor should programs be penalized for providing good advice to their students in terms of whether continuing in graduate school is the right decision for that individual. Finally, we think it is important to at least ask the question as to whether the GPFA metrics should be aligned to a greater extent with factors considered in national program rankings (e.g. US News and World Report).

For the current academic year, only ~7% of the GPFA funds are apportioned based on the performance metrics. As such, the extent to which many CoE programs received less funds when compared to a purely enrollment-based apportionment is relatively small. However, as the fraction of GPFA funds determined based on performance metrics is expected to increase over time the penalty for many CoE programs will increase if the same metrics continue to be used. It is suggested that the current performance-based metrics be revised prior to the 16-17 academic year and that Graduate Studies take into account programmatic differences when developing and implementing any future metrics.

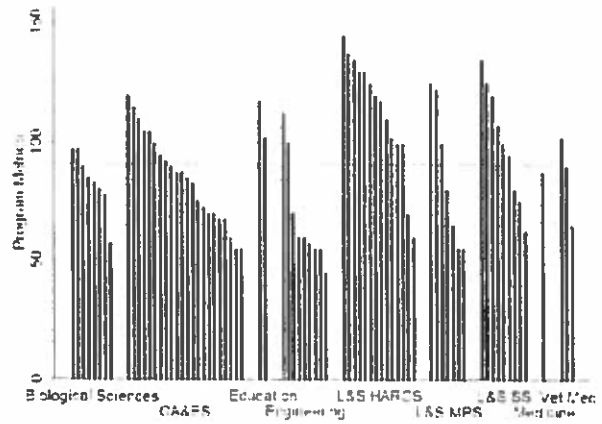


Fig.1. Distribution of "quality points" for graduate programs, grouped according to College. Note that in CoE all but two programs are well below the average.

Appendix C:
Charge Letter regarding MS Pilot funds allocation

UNIVERSITY OF CALIFORNIA, DAVIS

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

JENNIFER SINCLAIR CURTIS, DEAN
PHONE: (530) 752-0554
FAX: (530) 752-8058
EMAIL: jscurtis@ucdavis.edu

COLLEGE OF ENGINEERING
OFFICE OF THE DEAN
ONE SHIELDS AVENUE
DAVIS, CA 95616-5294

April 7, 2016

GRADUATE STUDIES COMMITTEE MEMBERS
College of Engineering

RE: Charge to the Graduate Studies Committee on the Allocation of MS Pilot Revenue

Dear Colleagues,

I am aware of the discussions by the Graduate Studies Committee (GSC) this year regarding the distribution of the MS Pilot program funds. I have agreed to the current GSC-recommended distribution plan for academic year 2015-2016 and 2016-2017 which provides a fixed allocation to each program that participated in the pilot.

To understand the MS Pilot program, I have read through all the existing original documents regarding the program. Associate Dean VanderGheynst has met with representatives from Budget and Institutional Analysis for their historical perspective and corresponded directly with former Graduate Studies Dean Gibeling in an attempt to determine the original intent of the program. It is evident that the funds generated by this program were intended to benefit graduate education, however the College has no metrics or guidelines for their allocation. I wish to develop a clear set of guidelines for the allocation of these funds and believe that all graduate programs in the College should benefit from future allocations.

I would very much appreciate your advice and counsel in the form of written recommendations that will assist me in the establishment of these guidelines. I would appreciate receiving this advice in the form of a short report no later than June 30th.

I appreciate in advance your willingness to accept this assignment, welcome any questions, and look forward to your report.

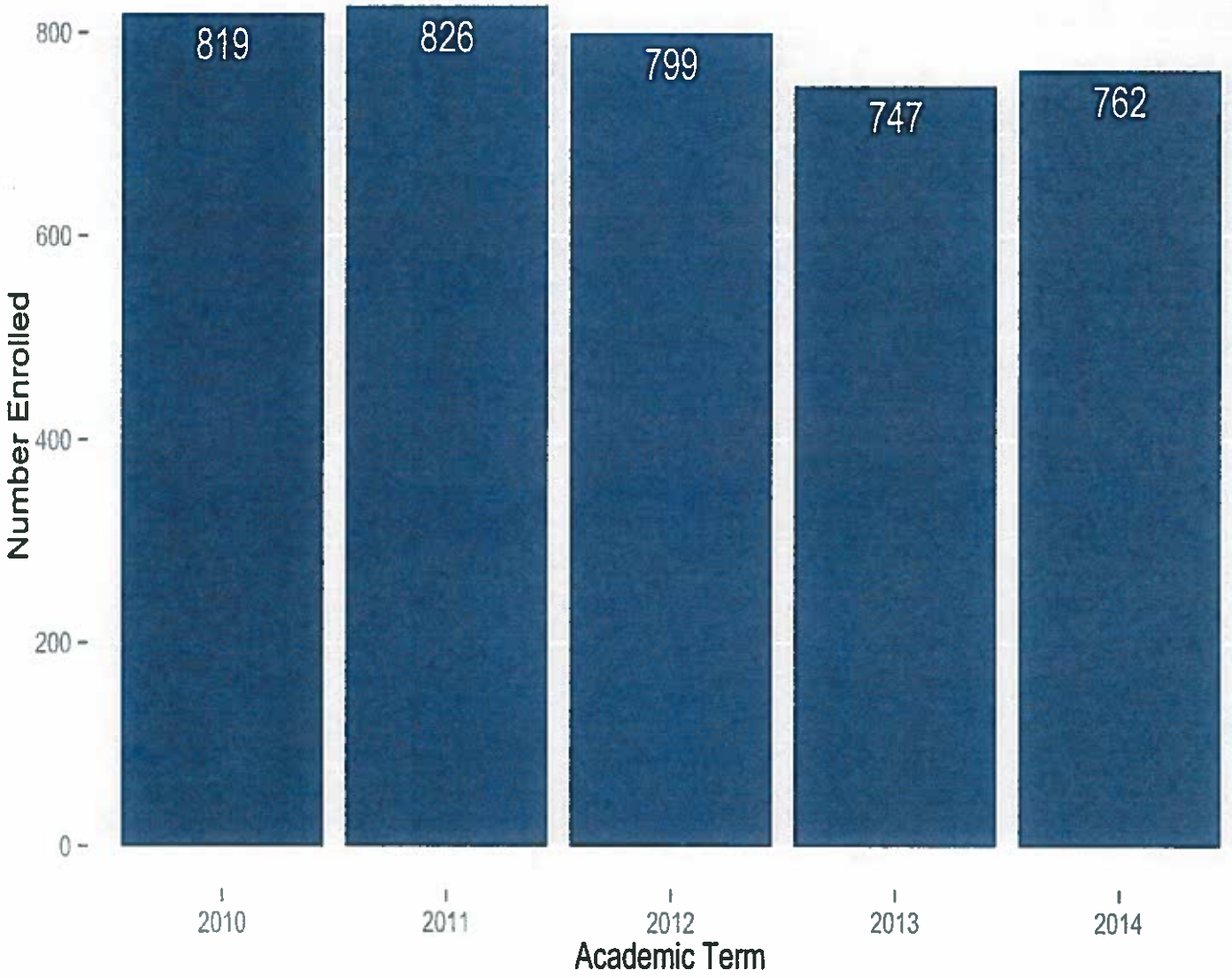
Sincerely,

Jennifer Sinclair Curtis

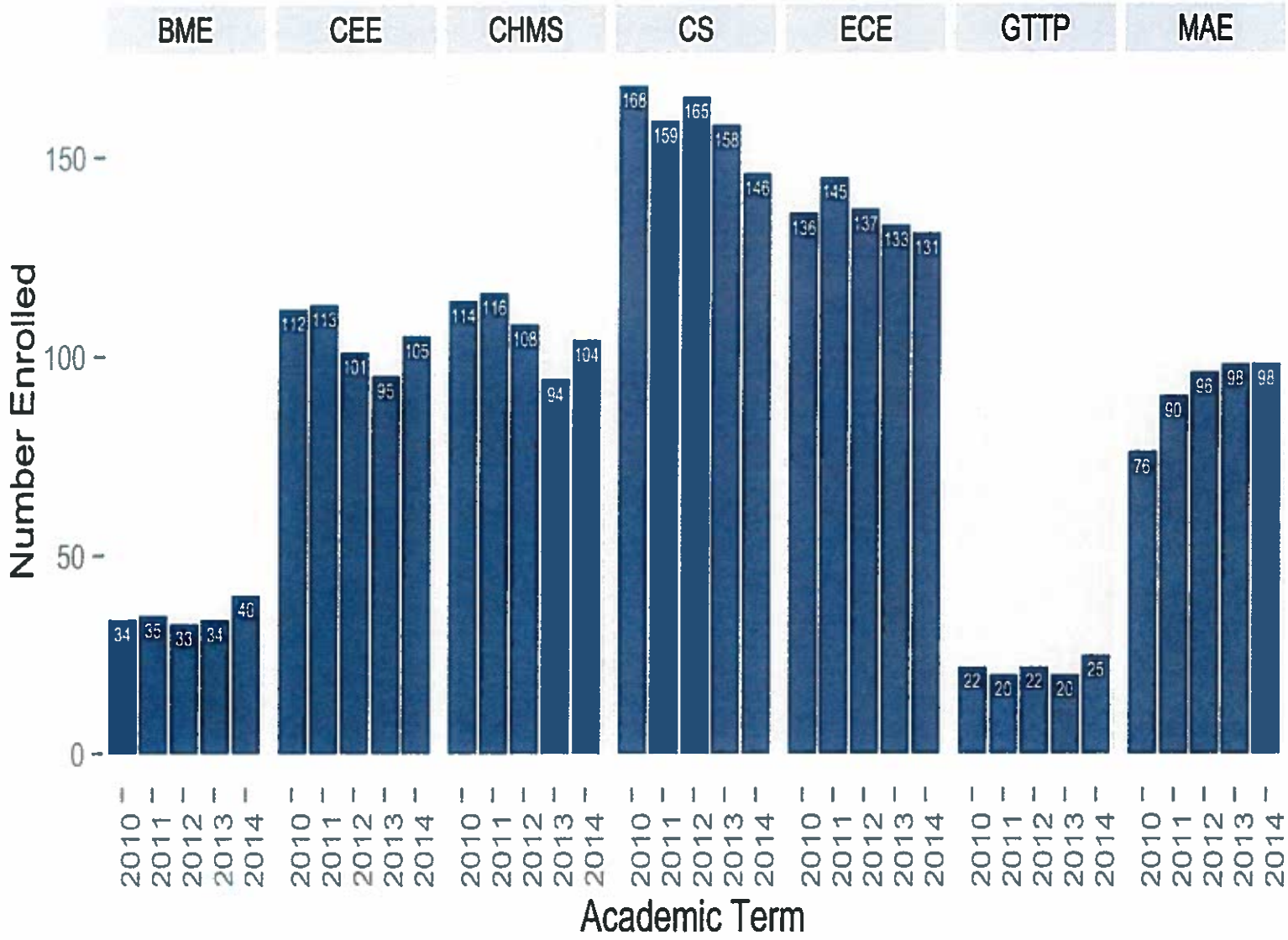
Jennifer Sinclair Curtis
Dean, College of Engineering

Appendix D:
Graduate Enrollment Statistics

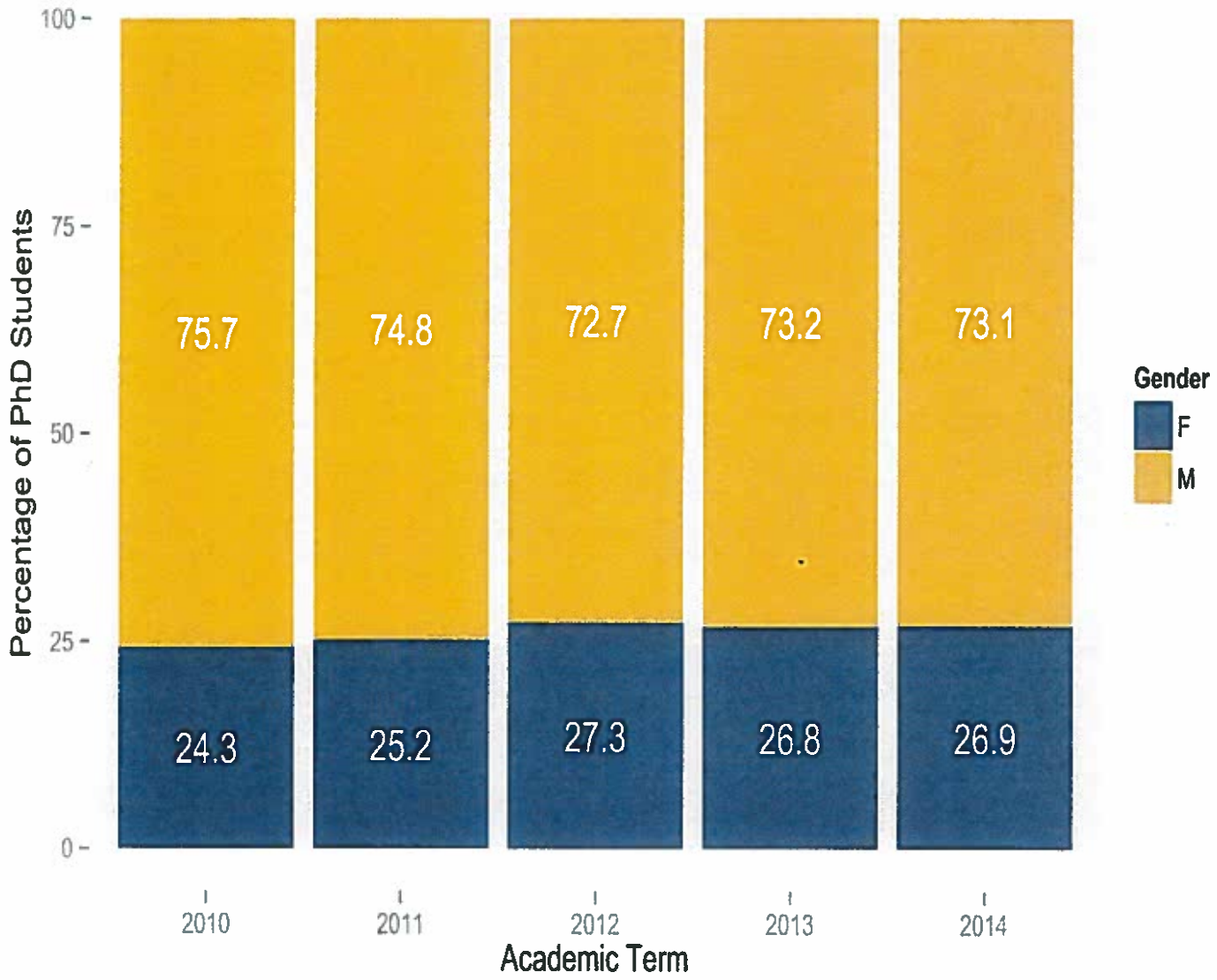
Number of PhD Students (enrollment)



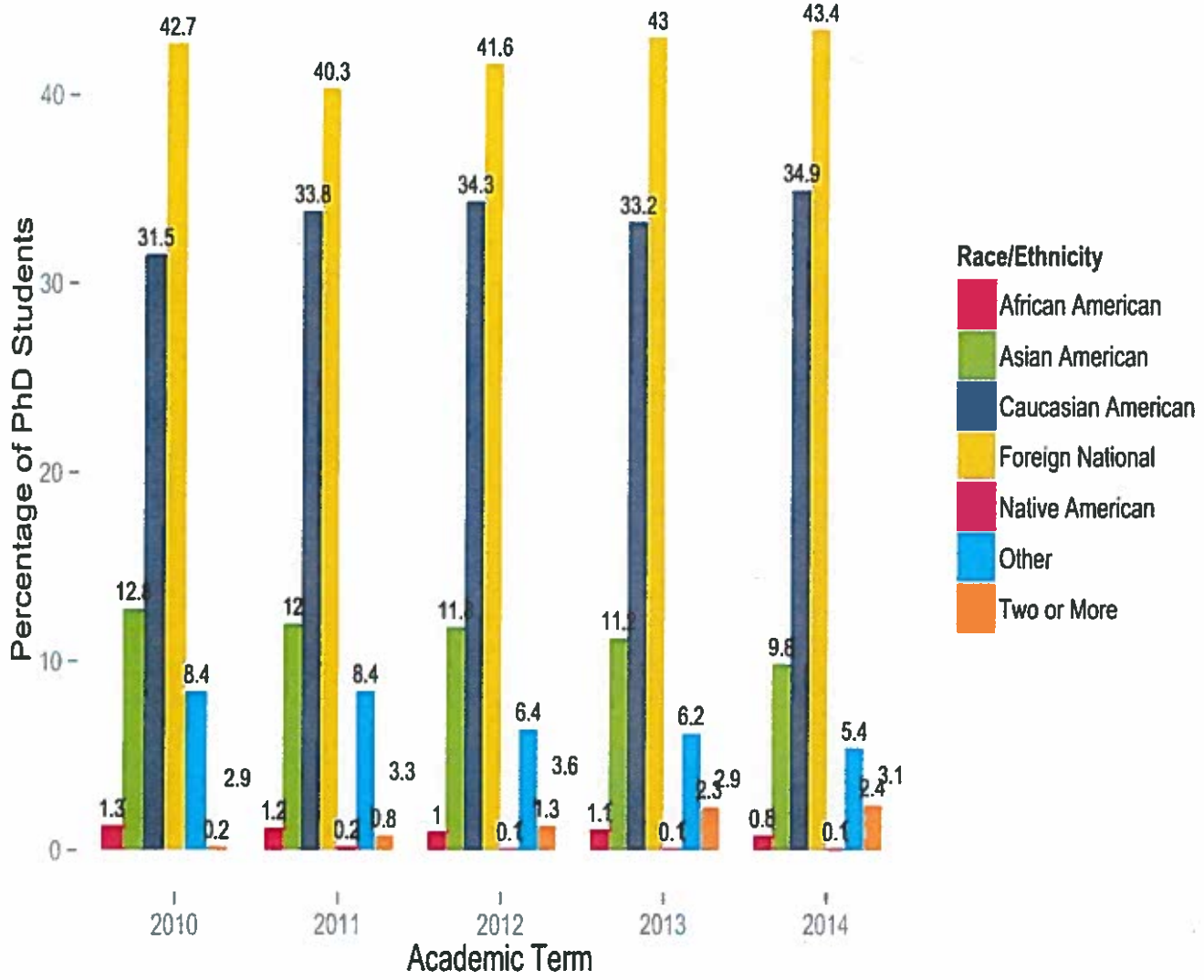
PhD Enrollment by Department



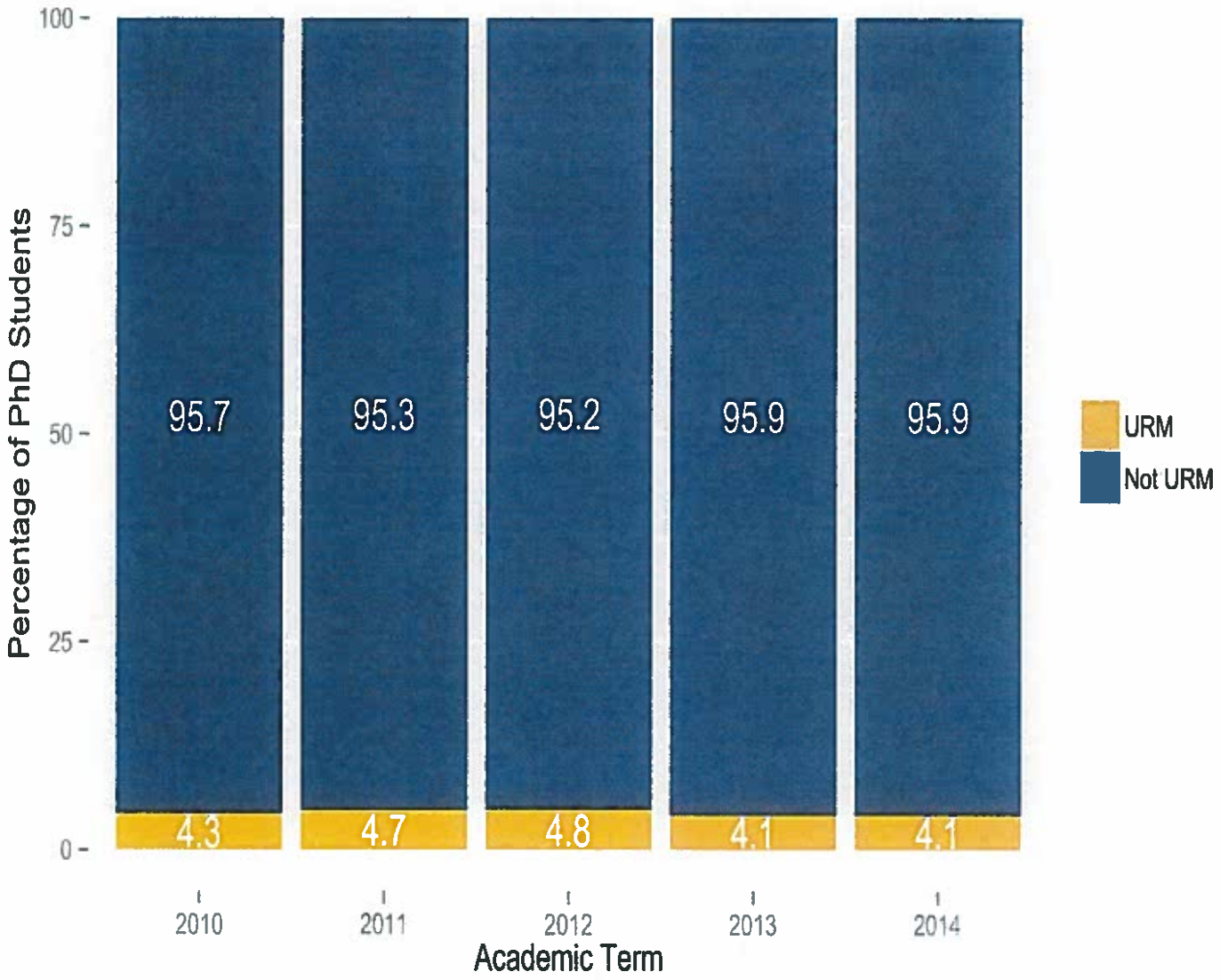
% Female


100
75
50
25
0
Percentage of PhD Students
75.7
74.8
72.7
73.2
73.1
24.3
25.2
27.3
26.8
26.9
2010
2011
2012
2013
2014
Academic Term
Gender
F
M

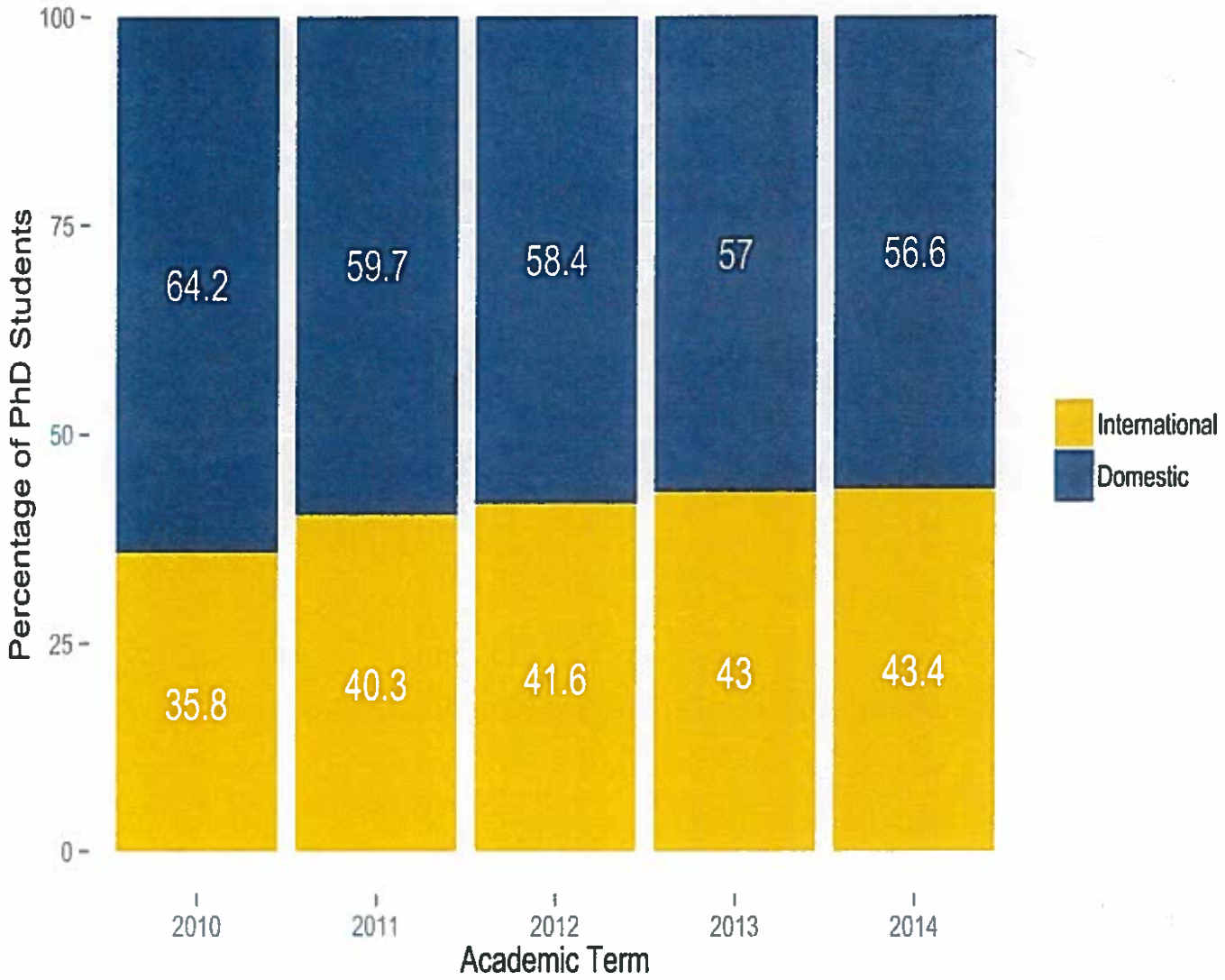
% Hispanic
% Black or African American



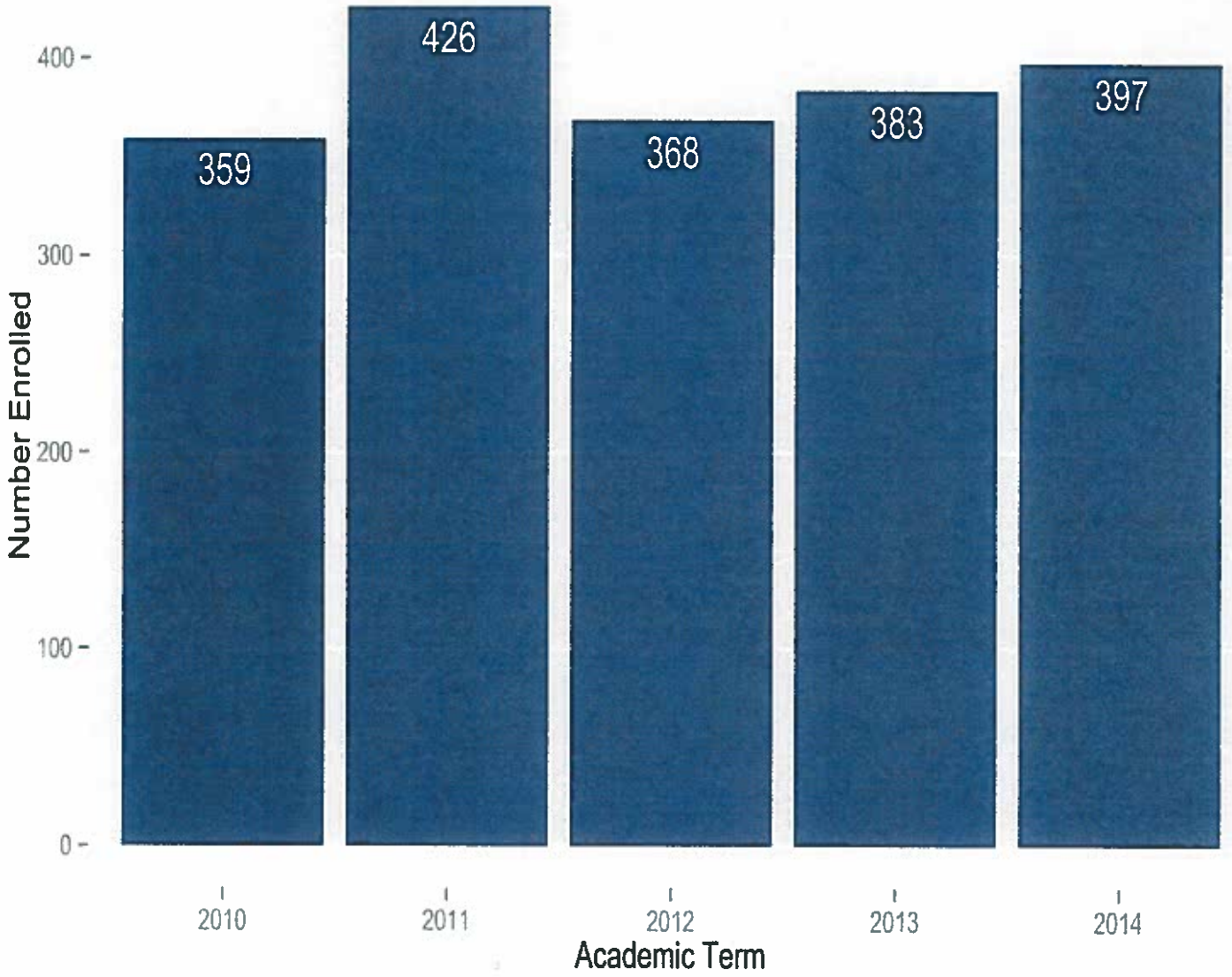
% Underrepresented Minority



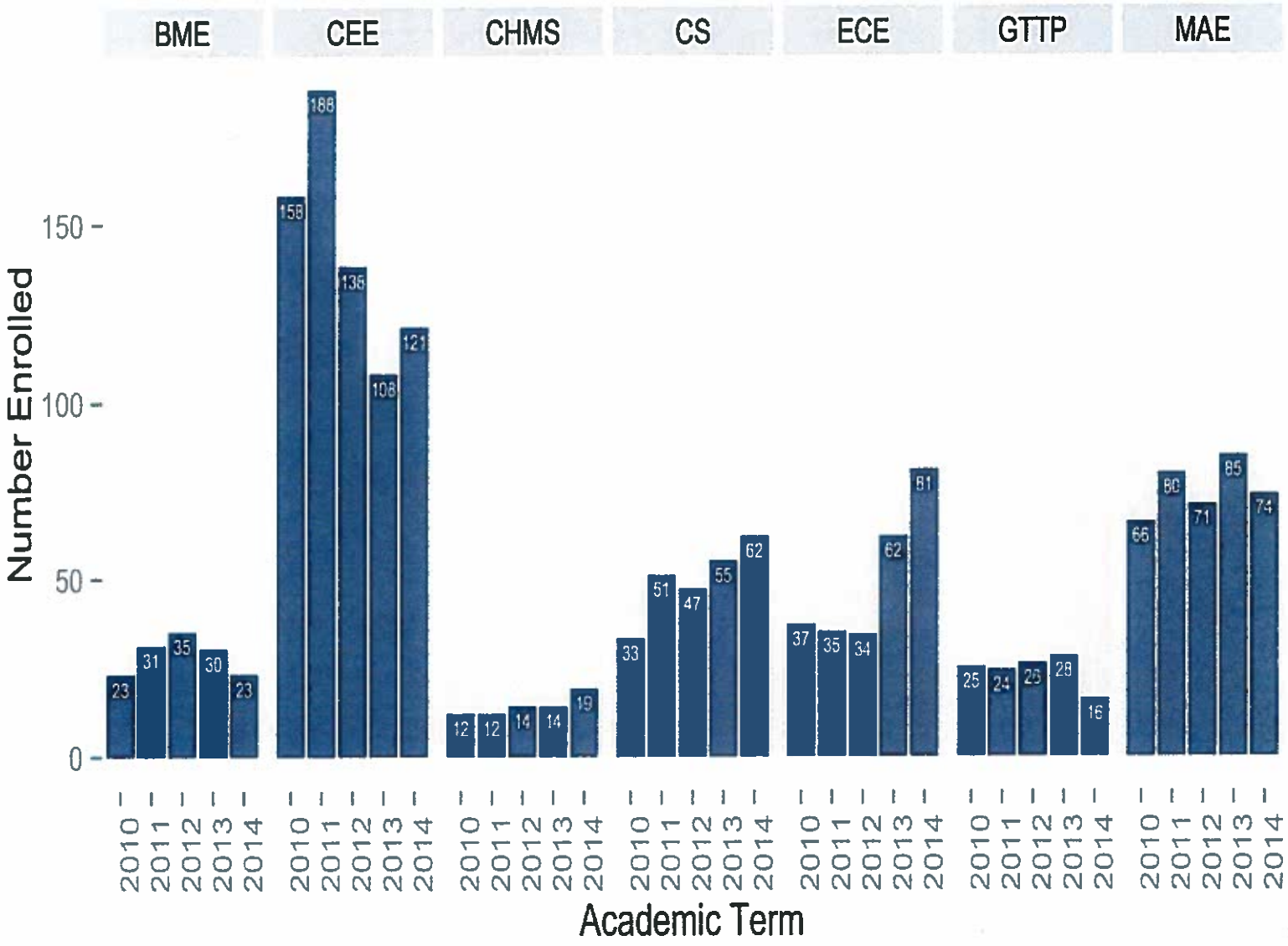
% International



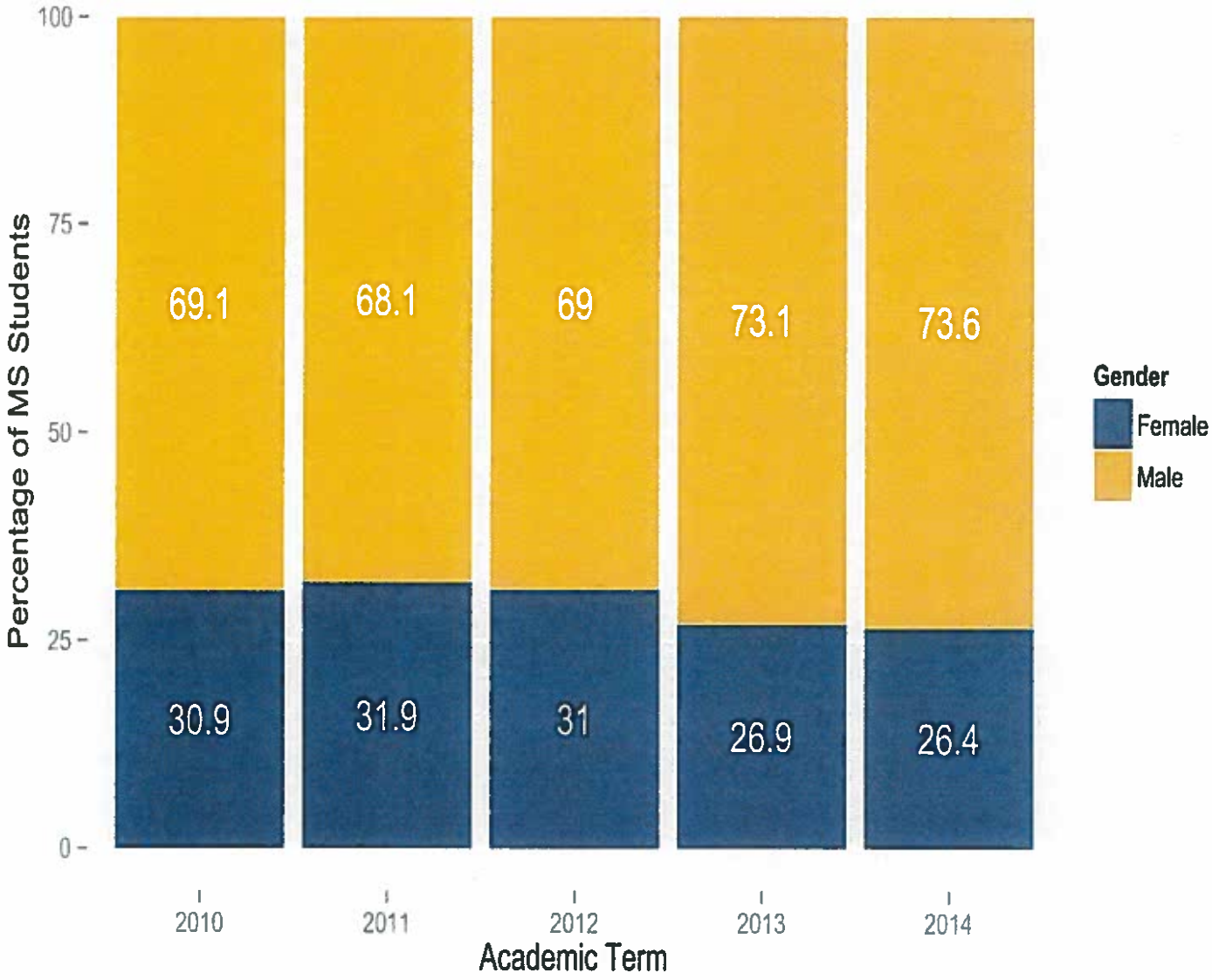
MS Enrollment



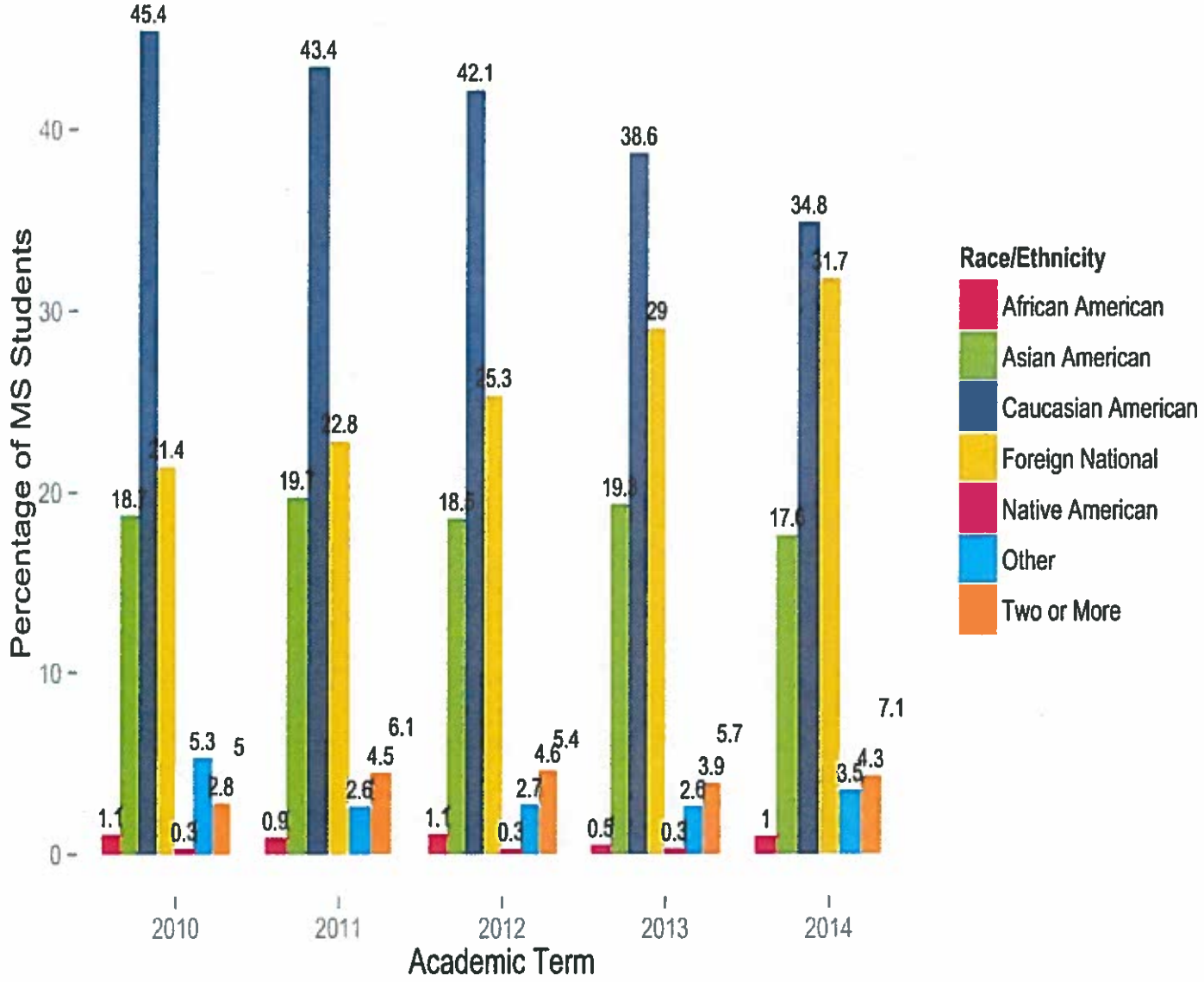
MS Enrollment by Department



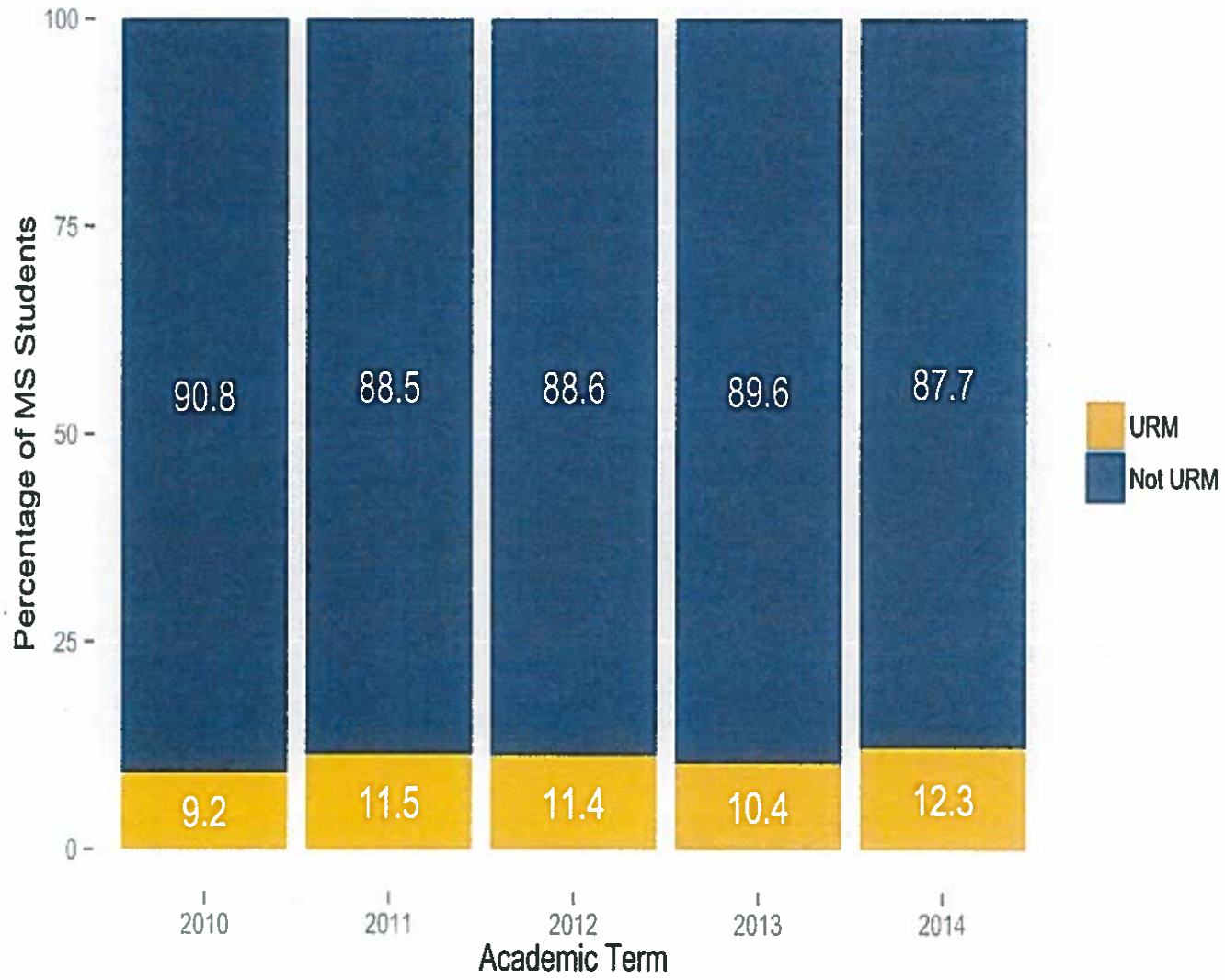
MS Enrollment by Gender



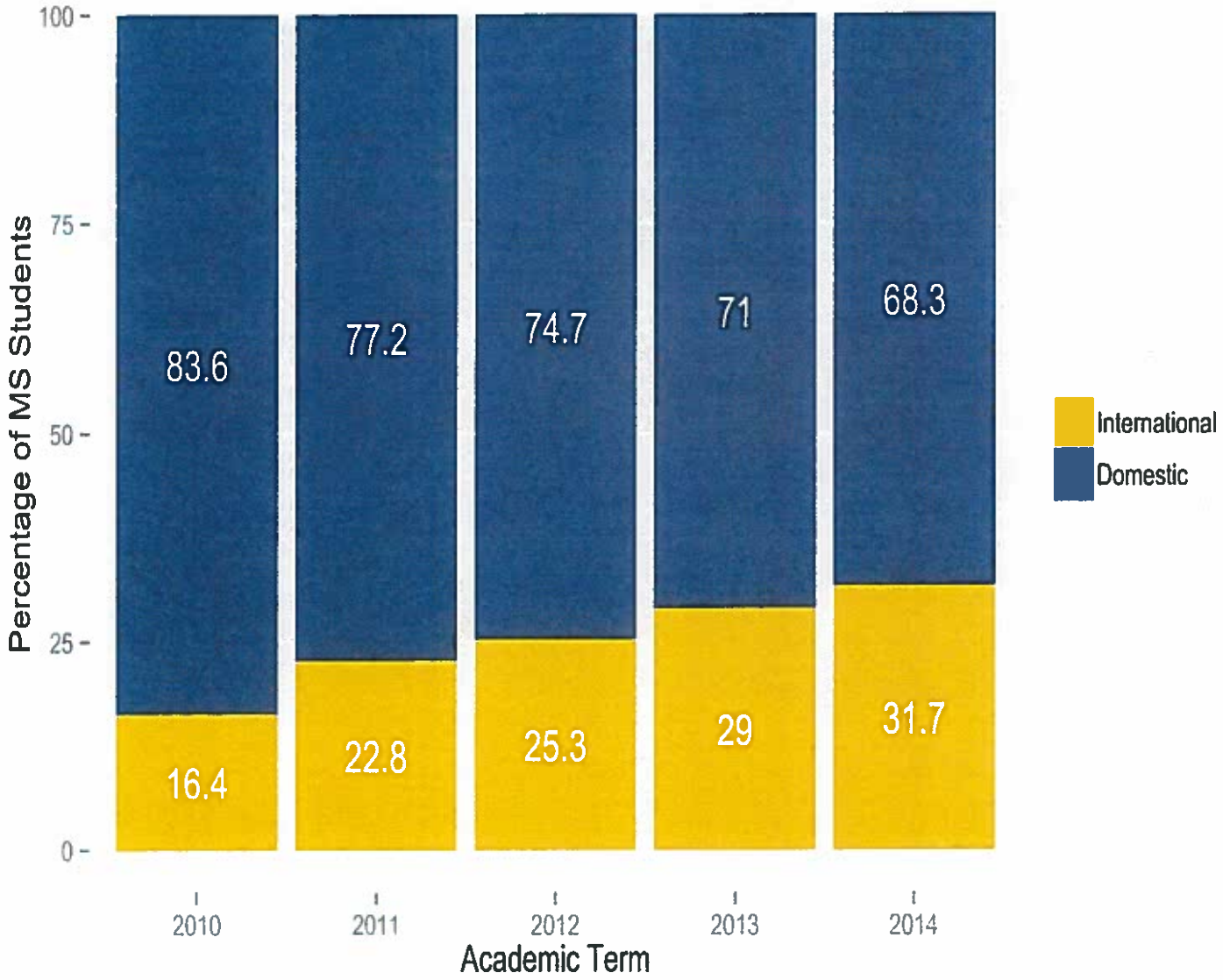
MS Enrollment by Race/Ethnicity



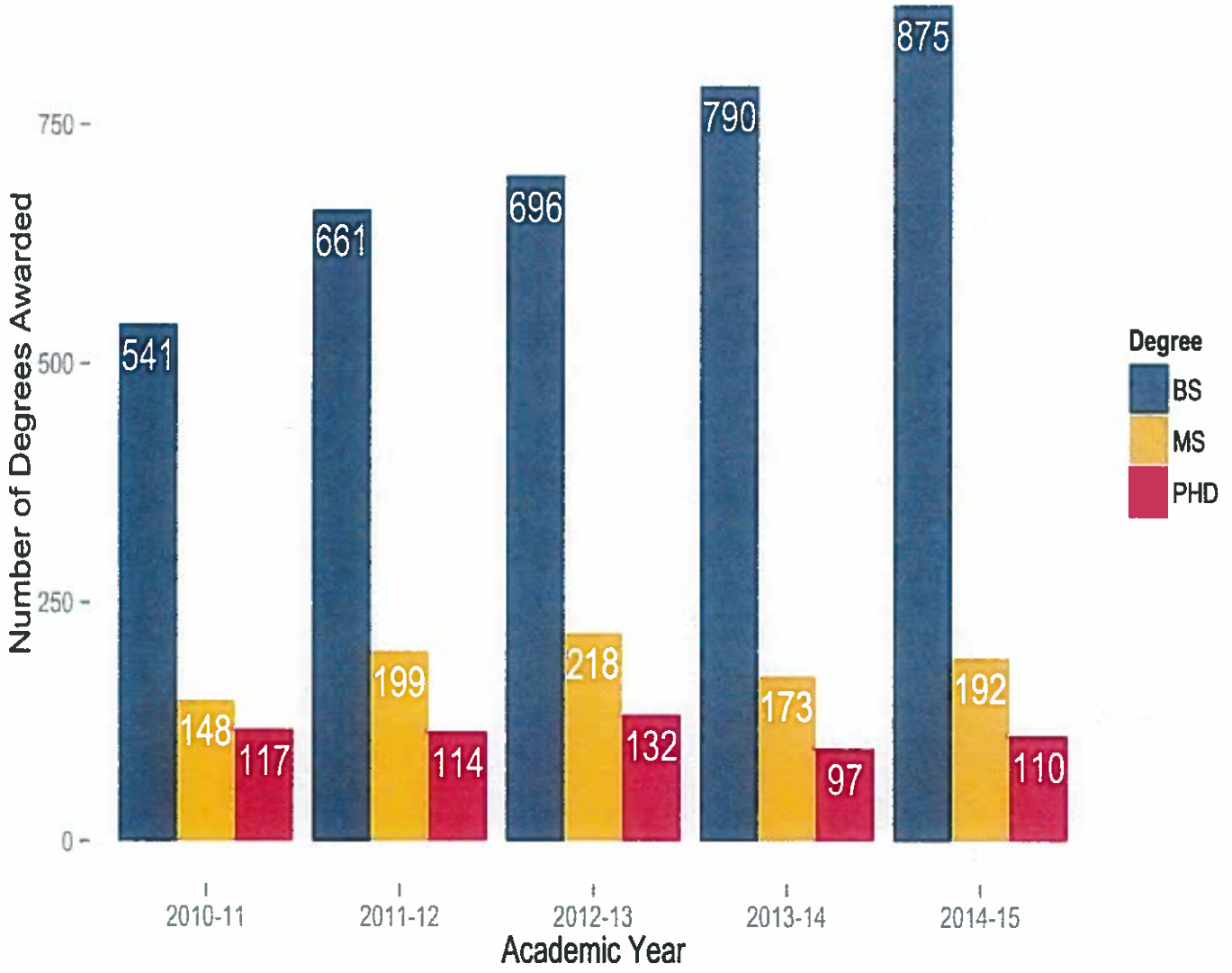
MS Enrollment by Underrepresented Minority



MS Enrollment by International



Number of Degrees Awarded (BS, MS, PhD)



Appendix E:
Distance Learning Program Presentation

UCDAVIS
COLLEGE OF ENGINEERING

COE On-line Learning Facilities and Distance Learning Program

December 2015

Jean VanderGheynst

Overview

- On-line learning facilities
- Introduction to distance learning program
- Data on facility use
- Video recording
- Contract with LLNL

On-Line Learning Facilities

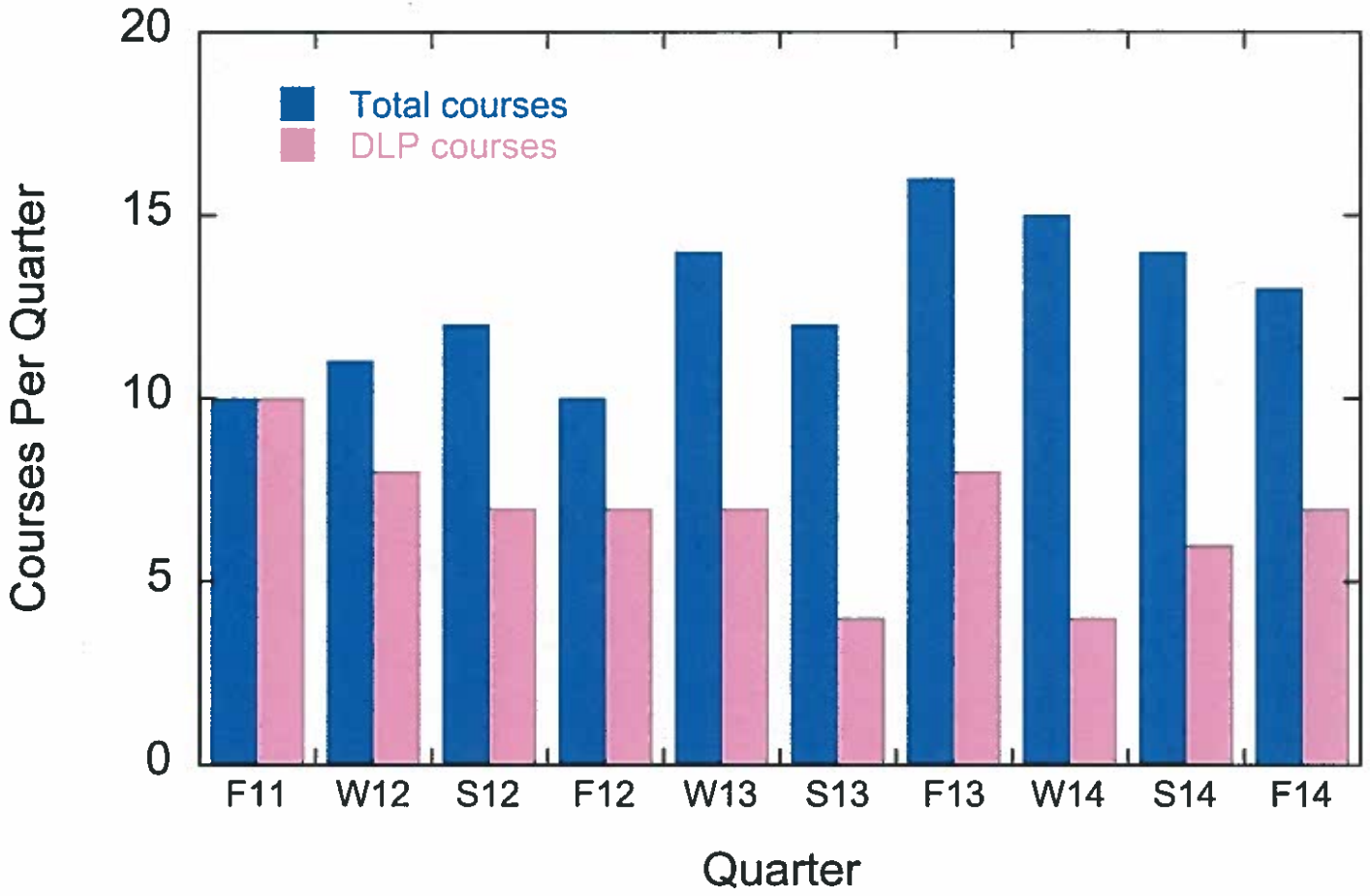
On-Line Learning Facilities

- Located in 1062 and 1070 Bainer Hall
  - Seating capacity in 1062: 70 fixed
  - Seating capacity in 1070: 30 fixed + 10 floating desks
- Configured for video recording of lectures
- Used for
  - Classes offered as part of Distance Learning Program (DLP)
  - Activities that further the educational and research missions of the college
- Rooms are administered by COE

On-Line Learning Facilities – Prioritized Activities

1. Classes that are requested by DLP students
   - Supported by contract from LLNL (~$60k per year)
2. Recorded courses for non-degree seeking students, such as short courses and professional certification programs
   - The reimbursement rate is $60 per hour to cover the full cost of staff time and equipment usage
3. Regular curriculum courses that are recorded
   - The reimbursement rate is $20 per hour to cover the cost of staff time
4. Non-recorded seminars, classes, and other events
   - no charge

Use of on-line learning facilities: Fall 2011-Fall 2014



Enrollments in courses offered in on-line learning facilities: Fall 2011-Fall 2014

Department	Total number of course offerings	Number of undergraduate courses	Total enrollment	Number of DLP students in courses
Applied Science	3	1	27	1
Biomedical	2	0	47	2
Chemical/Materials	3	0	53	1
Civil	12	0	243	15
Computer Science	30	3	819	34
Electrical	9	2	168	0
Mathematics	9	3	334	9
Mechanical	58	15	1800	39
Physics	1	0	13	1
TOTAL	**127**	**24**	**3504**	**102**

Lecture recording

- Currently one video stream recorded
- The facility uses a streaming only technology from Mediasite
  - Viewers (a.k.a. students) do not have access to download the media onto their local computers.
- The Mediasite system requires authentication to access recorded lectures
- The Mediasite lectures can be delivered via anonymous access or through an authenticated session such as SmartSite
- If using an authenticated session, only students enrolled in the SmartSite course would have access to view the lectures

Distance Learning Program

- Originally established for students and staff at LLNL and Sandia
  - 2,000+ classes have been broadcast for students and staff at LLNL and Sandia over the past 40 years
  - 145+ degrees awarded to students who took most or all of their courses through DLP
- Provides a way for our students and full time employees at LLNL to take course work needed for their graduate programs
  - For some participants, it would be difficult for them to complete required course work without program

Course selection and enrollment in DLP

- Courses offered through DLP are determined by student requests
  - Students decide what courses to take in consultation with faculty advisor and/or supervisor at LLNL or Sandia
  - Regularly enrolled students: students must get consent from Department Chair and faculty adviser to participate
  - Open Enrollment students: students must get consent from course instructor and chair of department administering course
    - Usually advised by graduate coordinator on course selection
- Assistance with UC Davis administrative paperwork is provided by DLP staff (currently Jan Neff)

Homework, class handouts, exams

- Communication
  - Email with the UC Davis DLP staff, instructor, or TA
- Course materials and link to videos through Smartsite and/or Mediasite
- In-class exams are taken at UC Davis or LLNL and are proctored

Agreements with LLNL

- Agreement with LLNL (~$60k per year) provides salary for staff to maintain facility and stream video
- See handouts
  - Subcontract
  - Statement of Work
  - Agreement for Course Instruction

Summary

- The on-line learning facilities are a college resource
  - While priority is for DLP teaching, there are other opportunities to
    - Increase use for distance learning
      - Summer session and/or regular session courses for prospective transfer students
      - Courses for multi-institution training grants
    - Improve access to students with disabilities
- Guidance is needed on contracts with LLNL

Appendix F:
Proposal for Designated Emphasis in Engineering Education

Proposal: Designated Emphasis in Engineering Education

1. Description of the Designated Emphasis

The Designated Emphasis (DE) in Engineering Education offers Ph.D. students in affiliated programs the opportunity to prepare for educational roles in research, teaching, and program administration at various academic institutions (including K-12 schools, universities, colleges, and community colleges); educational and government agencies; research foundations; and industries that are looking for engineers who are highly competent in their specific discipline but with an added emphasis in engineering education.

This designated emphasis will provide engineering doctoral students the following benefits:

- Theoretical background and practical experience in engineering education;
- Knowledge and awareness of the benefits and opportunities for diversifying the engineering profession to be more inclusive;
- Improvement in instructional skills through mentored teaching experiences;
- Experience in developing pedagogical strategies and assessment programs that respond to specific needs;
- Practical and mentored experience on their path to becoming effective educators;
- Experience in disseminating discipline specific research to a broader audience;
- Preparation for writing and/or leading engineering research proposals that have an educational component.
- Preparation for writing and/or leading educational proposals focused on engineering.

Description of existing Ph.D. programs in engineering at Davis

There are currently six departmentally based graduate programs and three interdisciplinary graduate groups with administrative homes in the College of Engineering awarding doctoral degrees. The number of graduate degrees granted recently and the current enrollments are presented on Table 1. Each program is highly discipline-specific and graduates take many different career paths, including faculty and post doctoral positions as well as positions in consulting, government agencies, and industry. One common theme amongst these different fields is that each of these graduate programs has a subset of doctoral students for whom engineering education will comprise some or a majority of their career.

Rational for a Designated Emphasis in Engineering Education

Increasing the number and diversity of students pursuing engineering degrees is critical for meeting the workforce demands and for addressing complex challenges facing California, the nation, and the world. Undergraduate enrollment in the UC Davis College of Engineering has increased dramatically over the past five years, expanding from 3,200 to 4,300 students and further growth is anticipated. Concomitant with the need to educate a greater number of

engineering students, colleges of engineering nationwide recognize that we need to recruit, retain, and educate inclusive communities of students from a wide range of backgrounds. Full inclusion of persons from groups historically

Table 1. Summary of Graduate Programs in Engineering at UC Davis

Program Name	Ph.D. awarded 2014/15	Ph.D. awarded 2013/14	Ph.D. awarded 2012/13	Current Enrollment
Biological Systems Engineering	6	1	6	37
Biomedical Engineering	14	15	17	84
Chemical Engineering	7	10	16	48
Civil & Environmental Engineering	17	9	17	106
Computer Science	27	22	25	149
Electrical & Computer Engineering	21	13	18	126
Material Science & Engineering	2	7	11	56
Mechanical & Aerospace Engineering	12	9	11	83

Program Name	M.S. awarded 2014/15	M.S. awarded 2013/14	M.S. awarded 2012/13	Current Enrollment
Biological Systems Engineering	5	3	11	9
Biomedical Engineering	7	12	8	8
Chemical Engineering	4	4	4	9
Civil & Environmental Engineering	56	51	96	96
Computer Science	32	33	27	75
Electrical & Computer Engineering	44	24	25	91
Material Science & Engineering	4	3	3	8
Mechanical & Aerospace Engineering	28	29	36	58

Note: the M.S. numbers are provided because a significant number of the M.S. students continue on for a Ph.D.

underrepresented in engineering remains an elusive goal in our profession. Furthermore, many institutions of higher education are beginning or accelerating efforts to incorporate new hands-on design experiences and adapt new technology into the engineering curriculum. As engineering disciplines become more specialized, requiring ever increasing depth of knowledge in sub-disciplines, undergraduate students sometimes find it hard to make the connection between their ultimate goal of "solving important problems in the world" and the high work load and fast-paced, rigorous series of courses that form the foundation of all engineering disciplines. The

desired growth in engineering enrollments and concomitant diversity and the need for new approaches to educating engineering students motivates this proposal for a Designated Emphasis in Engineering Education.

National Science Foundation. The National Science Foundation has recently launched three initiatives directed at improving how engineers are being prepared for their careers as well as addressing the unacceptable low percentage of underrepresented groups entering the profession. The launching of these initiatives (Professional Formation of Engineers (PFE), Improving Undergraduate STEM Education (IUSE), and Revolutionizing Engineering Departments (RED)) indicates the recognition of a national need to provide graduate students in engineering with explicit opportunities to improve their chances of becoming effective and successful educators and researchers. Even for our doctoral students who intend to largely focus on research in their careers, having an emphasis in engineering education will be beneficial. All successful NSF research proposals must contain a section labeled "Broader Impacts of the Proposed Work".

> *"Broader impacts may be accomplished through the research itself, through the activities that are directly related to specific research projects, or through activities that are supported by, but are complementary to the project. NSF values the advancement of scientific knowledge and activities that contribute to the achievement of societally relevant outcomes. Such outcomes include, but are not limited to: full participation of women, persons with disabilities, and underrepresented minorities in science, technology, engineering, and mathematics (STEM); improved STEM education and educator development at any level; increased public scientific literacy and public engagement with science and technology; improved well-being of individuals in society; development of a diverse, globally competitive STEM workforce; increased partnerships between academia, industry, and others; improved national security; increased economic competitiveness of the United States; and enhanced infrastructure for research and education."* (taken from NSF proposal guidelines)

Although many of our doctoral students do gain experience in writing research proposals during their graduate work, few if any are given guidance in how to translate their technical expertise into the broader impact on society, which is increasingly required in successful research proposals.

National Academy of Engineering. In addition to preparing our doctoral students for professorial roles in colleges and universities, there is a need to mentor graduate students on teaching pedagogy and assessment and in the translation of engineering research and fundamentals into the K-12 curriculum. The National Academy of Engineering's Fall 2009 publication (The Bridge: Linking Engineering and Society) was devoted to the topic of K-12 Engineering Education. In the lead article (The Status and Nature of K-12 Engineering Education in the U.S. by Linda Katehi, Greg Pearson and Michael Feder), the authors state *"Although many questions about K–12 engineering education remain unanswered, engineering is being taught in K–12 schools around the country, and it appears that the trend is upward. Thus it is imperative that we begin thinking about ways to guide and support engineering education in the future. An underlying question for policy makers is how engineering concepts, skills, and habits of mind should be introduced into the school curriculum."*

Even more recently the NAE began a new project entitled Guiding Implementation of PreK-12 Engineering in the United States. The goal of this three-year project is to provide guidance to key stakeholders in U.S. K-12 education regarding effective engineering education. Thus there is clearly a growing need to support effective translation of engineering into the K-12 curriculum.

ABET Engineering Accreditation. Another potential benefit expected to occur from a DE in Engineering Education is better training of future educators in providing a continuous, consistent and sustainable focus on evaluation and assessment of the engineering curriculum. Every six years, the accreditation board for engineering (ABET) conducts a rigorous review of all accredited engineering undergraduate degree programs across the country. The requirements for a successful review create an enormous workload and the vast majority of faculty are not well prepared to lead their departments through a successful review. Providing our graduates with an understanding of evaluation and assessment practices, particularly in the context of ABET requirements, will allow an improved demonstration of reflective practice, including the informed use of data to monitor and assess student learning. This understanding of program evaluation and assessment gained by our graduates is also likely to be valuable to them when submitting proposals for graduate training grants such as provided by the Department of Education (GAANN or Graduate Assistance in Areas of National Need) and other government agencies.

Purdue University School of Engineering Education (ENE). In 2004, Purdue established the world's first engineering education doctoral program. The program remains today the best known in the U.S. for its focus on rigorous fundamental research on engineering learning and connecting that research into practice. Our DE in Engineering Education is not meant to be nearly as in depth but is considered a significant step in improving the preparation of our engineering doctoral students for careers that have an education component.

The *Journal of Engineering Education* (JEE) is the research journal for engineering education and will provide a useful avenue for dissemination of any innovative work done in the DE. JEE is a peer-reviewed international journal published quarterly by the American Society for Engineering Education (ASEE) in partnership with a global community of engineering education societies and associations. JEE is listed in the Science Citation Index (categories: Education, Scientific Disciplines; Engineering, Multidisciplinary), and the Social Sciences Citation Index (category: Education, Education Research) by Thomson-Reuters and the Institute of Scientific Information (ISI) and the tables of contents are reproduced in ISI's Current Contents/Engineering, Computing and Technology and Current Contents/Social and Behavioral Sciences. JEE is also listed in the EBSCOhost research databases (Education Research Complete™ and Academic Search Complete™) and the Elsevier bibliographic research database, Scopus. JEE is a founding member of the International Federation of Engineering Education Societies, and the journal is rated A* by the Australian Research Council. The existence and strength of JEE and ASEE indicate that our Designated Emphasis in Engineering Education will have a national and international framework in which to grow.

UC Davis College of Engineering. In the past five years, there has been a major shift in engineering curricula and pedagogy to improve student-learning experiences and retention and increase student engagement in courses using, for instance, design-centric, project-based learning. To meet this shift, the College of Engineering has, in the past year, hired a cohort of faculty specifically selected on the basis of their focus on, and potential for, enriching our

undergraduate engineering program. These new faculty will also play an important advising role for graduate students interested in engineering education. A significant number of our doctoral students do pursue a teaching career and these future faculty are likely to make transformational changes in the engineering curriculum. We can not continue to rely on only traditional research focused graduate programs to prepare these future engineering educators. We need to provide additional and explicit opportunities for our graduate students to become effective leaders in engineering education.

Center for Educational Effectiveness. The Center for Educational Effectiveness (CEE) at UC Davis is anticipated to be a valuable partner in this DE. Currently the Center staff provide "*consultative support to faculty, post-doctorate scholars, and graduate students who are interested in applying research-based best practices that promote student learning; deepening their understanding of how students learn; and promoting excellence in education for UC Davis students*". In particular, the Center has the capability to provide individualized mid-quarter interviews, video recordings and subsequent feedback, and classroom observations as well as workshops and consultations on teaching skills for graduate students.

As one example of how the Center has begun partnering with the College of Engineering in developing this Designated Emphasis, Dr. Kem Saichaie, an Educational Specialist in the Center, is working with us to establish a professional learning community to support on-going inquiry about teaching and learning. To this end, Dr. Saichaie has met with ten of the newest tenure track faculty in the College of Engineering to facilitate the development of an Engineering Education Learning Community (EELC). This faculty group (or EELC) has chosen to meet regularly this year to explore the culture of teaching and learning at UC Davis and in the College of Engineering; identify goals for professional development related to evidence-based and innovative approaches to engineering education; and build capacity for positively impacting the education of undergraduate students. These faculty will participate in regular seminar-style meetings facilitated by content-area experts from Undergraduate Education, senior engineering faculty, and guest speakers from the UC Davis campus. Some of the more specific self-stated goals of this EELC include supporting fellow participants; addressing specific campus needs; reading and discussing articles and books on education, learning, teaching; observing one another's classes, viewing and discussing videos and webinars on teaching; implementing selected teaching methods in their own classes; and conducting informal classroom research or formal (and possibly funded) educational research. These faculty will also play an influential role in this Designated Emphasis.

Examples of Currently Posted Relevant Positions. As an example of the demand for this type of emphasis, the October 1, 2015 job announcements in the American Society of Engineering Education journal included the following. In addition, and not listed below, there are numerous regular engineering faculty positions available that do not explicitly specify "education" but routinely require both a research and teaching statement as part of the application/interview process.

- Multiple Positions: Engineering Education Research Faculty Positions, All Ranks, University of Michigan
- Post-Doctoral Scholar Position in Engineering Education Research at Oregon State University
- Postdoctoral Research Fellow in Engineering Education Research at University of Michigan

- Post-Doctoral Research Position in Professional Development of Engineering Graduate Students, University of Tulsa
- Assistant/Associate Professor in Engineering Fundamentals Department at Embry Riddle Aeronautical University, Daytona Beach
- Assistant/Associate Professor "Teacher-Scholars" in Multiple Departments, Cal State Los Angeles
- Research Assistant Professor with a Focus in Engineering Education Research, University of Pittsburgh, Department of Industrial Engineering
- Assistant/Associate Professor of K-12 Technology & Engineering Education, The College of New Jersey
- Director of PreK-12 Engineering Education and Outreach, Texas A&M Engineering

2. *Description of the Academic Nature of the Designated Emphasis*

A. Affiliated Ph.D. Programs List and Chairs' Letters

A list of the existing Ph.D. programs that will be contacted initially to offer affiliated status with the DE in Engineering Education is as follows:

1. Biological Systems Engineering
2. Biomedical Engineering
3. Chemical Engineering
4. Civil and Environmental Engineering
5. Computer Science
6. Electrical and Computer Engineering
7. Material Science & Engineering
8. Mechanical and Aerospace Engineering

A letter from each of the chairs of Ph.D. programs that intend to be affiliated is attached to this proposal. In the future, to establish a new affiliation with the Designated Emphasis in Engineering Education, the Chair of the Ph.D. program will write a letter to the DE Chair requesting affiliation and will provide the following information:

1. Declare the intent of the Ph.D. program to be affiliated with the DEEE
2. Describe the impact of the DEEE curriculum on the normative time to degree for students in the Ph.D. program, including commentary on whether any courses in the DEEE curriculum may be used to satisfy requirements of the Ph.D. program.
3. Describe how the Ph.D. program Chair assessed the level of support for the Ph.D. program's affiliation with the DEEE (e.g., a meeting vote or an e-mail ballot).

If the DEEE's Executive Committee approves the request for affiliation, then the DEEE Chair will forward the materials supplied by the Ph.D. program, plus a cover letter, to the Chair of Graduate Council, requesting approval of the affiliation. Graduate Council will vote on the request and provide written notification of the vote to the DEEE Chair with a copy to the Ph.D. program Chair.

B. Dean's Letter

A letter of support from College of Engineering Dean Jennifer Curtis is attached and indicates the resources available to support the DEEE.

C. Affiliated Faculty

A roster of faculty who intend to participate in the DEEE is attached. Because of the number of faculty requesting participation, they have written and signed a common letter. The letter indicates each faculty member's intent and agreement to participate in DEEE functions such as teaching, advising, administration, and qualifying examinations and dissertation committee service. In the future, faculty who want to join the DEEE will apply for membership to the Membership Committee of the DEEE (see proposed DEEE bylaws). Although the initial roster of DEEE faculty all have appointments in the College of Engineering, the DEEE's future faculty may include faculty outside of the College of Engineering affiliated Ph.D. programs who meet the membership criteria described in the bylaws. These faculty would have expertise in the area of the DE but might be housed in a department or program that does not offer a Ph.D. or might not be a member of a graduate program/group.

D. Admissions Criteria

Students interested in applying to the Designated Emphasis in Engineering Education need to be admitted through one of the affiliated Ph.D. programs. These Ph.D. programs serve as the students' home departments during their graduate studies. Once students are enrolled in one of the affiliated Ph.D. programs, they need to complete a Designated Emphasis Application Form. Students will be encouraged to complete their application process to the DE during their first year of graduate study; students must apply to the DE before taking their qualifying exams. Students also need to submit a letter of application to the Designated Emphasis in Engineering Education membership committee explaining their interests in and preparation for the Designated Emphasis.

E. Curriculum

1. Two quarters of ENG 390 (S/U grading only, 1 unit each time) I, II, III. The Teaching of Engineering.
   Currently all departments in the College of Engineering have a 390 course that teaching assistants (TA) register for while serving as TA. The students in the DEEE must serve as a TA a minimum of two quarters and will enroll in ENG 390 during those quarters. The participants each quarter will meet together one hour weekly with the instructor, a faculty member of the DEEE. Weekly reading assignments will include review of chapters from Doug Lemov's *Teach Like a Champion*[1]. Each chapter focuses on skills necessary for effective teaching. Reading assignments and discussions in seminar will guide instructor coaching and student practice, and help students understand the range of skills they need to achieve learning outcomes in an engineering lecture, laboratory or discussion setting.

[1] Lemov, D., Teach Like a Champion. 2010, San Francisco: Jossey-Bass.

The vast majority of doctoral students interested in becoming professors or having a teaching component in their career already serve as a TA at least once during their doctoral studies. This requirement will provide greater structure and will enable the TA to derive greater value from the teaching experience.

2. One quarter of ENG 295 (letter grading only, 2 units) III. Development of Discipline-Specific Education Module.
   We are proposing this new course to prepare graduate students to communicate their research area to a broad audience, fast track research developments into engineering curriculum, and develop lessons and activities in engineering science and design for K-12 and undergraduate learners. Lectures and associated assignments for this class will include (1) communication of engineering topics to a broad audience, (2) development and measurement of learning outcomes for engineering topics, and (3) development of an engineering lesson or activity for K-12 or undergraduate audiences. One optimal (but not required) product of this class would be an engineering education peer-reviewed paper, lesson or a conference presentation. At a minimum, the student will gain experience in translating their discipline specific research into the broader society.

3. One quarter of ENG 290C (S/U grading only, 1 unit) II. Seminar in Engineering Education. Students will participate in this seminar once during their doctoral studies. The seminar will consist of both campus and external speakers. The seminars will promote evidence-based, active learning strategies and practices and connect students with disciplinary peers to share ideas on learning theories and pedagogies, both seminal and emerging. This seminar, to be held weekly throughout the academic year, is intended to build a coalition of educators committed to student success who will act as change agents.

Changes in these requirements must be approved by Graduate Council.

Qualifying Examination

The student's qualifying examination committee will include at least one member of the affiliated faculty in the DE in Engineering Education. The DE member of the qualifying exam committee will be recommended by the Executive Committee of the DE. The chair of the DE and the student's Ph.D. program graduate adviser must co-sign the Qualifying Examination Committee form, which is submitted to Graduate Studies for approval by the Dean of Graduate Studies.

The qualifying examination will assess the student's level of knowledge within the area of the DE, as well as in the Ph.D. program. Satisfactory performance on the qualifying examination for the Ph.D. will be judged independently from performance on the DE. Thus, an allowable outcome of the qualifying examination is that the student's performance may be "passing" for the Ph.D. but "not passing" for the DE.

In the event that a student passes the PhD qualifying exam, but receives a "not pass" for the DE, the Executive Committee of the DE will define a plan for remediation. The plan may include, but is not limited to re-examination by the DE Executive Committee, coursework, teaching, or preparation of a paper. If the student is re-examined, the outcome is limited to "pass" or "fail". If

the student receives a "fail", the student is disqualified from the DE.

Dissertation Requirements

The student's dissertation committee shall be selected in accordance with the regulations of the Ph.D. program, but must include at least one member of the DE in Engineering Education. The DE member may be the dissertation committee chair.

Degree Conferral Process

The Designated Emphasis will be awarded solely in conjunction with the Ph.D. and will be signified by the degree designation "Ph.D. in X with an Emphasis in Engineering Education" where X will be one of the affiliated Ph.D. programs.

F. Student Advising

Working with the graduate advisers in the affiliated Ph.D. programs, the DE in Engineering Education graduate adviser will oversee students' academic progress towards fulfilling the DE requirements. Students will be expected to meet with the DE adviser as necessary to satisfy DE requirements. The DE graduate adviser will be responsible for informing both Graduate Studies and the student's Ph.D. program that the student has fulfilled all DE requirements prior to graduation.

2. Administrative Matters

The DE will have Bylaws, a Chair, Executive Committee, curriculum, admissions policy, and its faculty will participate in Qualifying Examinations and as Chairs or members of Dissertation Committees. If no faculty from an affiliated program join the DE, then the affiliation of that Ph.D. program will end. The Chair of the DE will notify the Graduate Council Chair when an affiliation ends. If no Ph.D. programs are affiliated with the DE, the DE will suspend admissions, and notify the Chair of Graduate Council.

A. Bylaws

The DE will be governed by bylaws that will be used to direct the administration of the DE and define the requirements for faculty participation in the program. The bylaws for the DE have been prepared as outlined in the *Bylaws Guidelines for Designated Emphasis Programs.* The proposed bylaws define the administrative structure of the group, the requirements for DE faculty membership and renewal, and regular meetings of the DE Chair and affiliated Ph.D. program Chairs, at a minimum of once a year to discuss administrative, instructional, and research resource needs. In addition, there will be an annual meeting of the DE Chair and participating faculty. The proposed bylaws are attached to this proposal. The bylaws, and any subsequent changes to the bylaws, must be approved by Graduate Council.

B. Resources

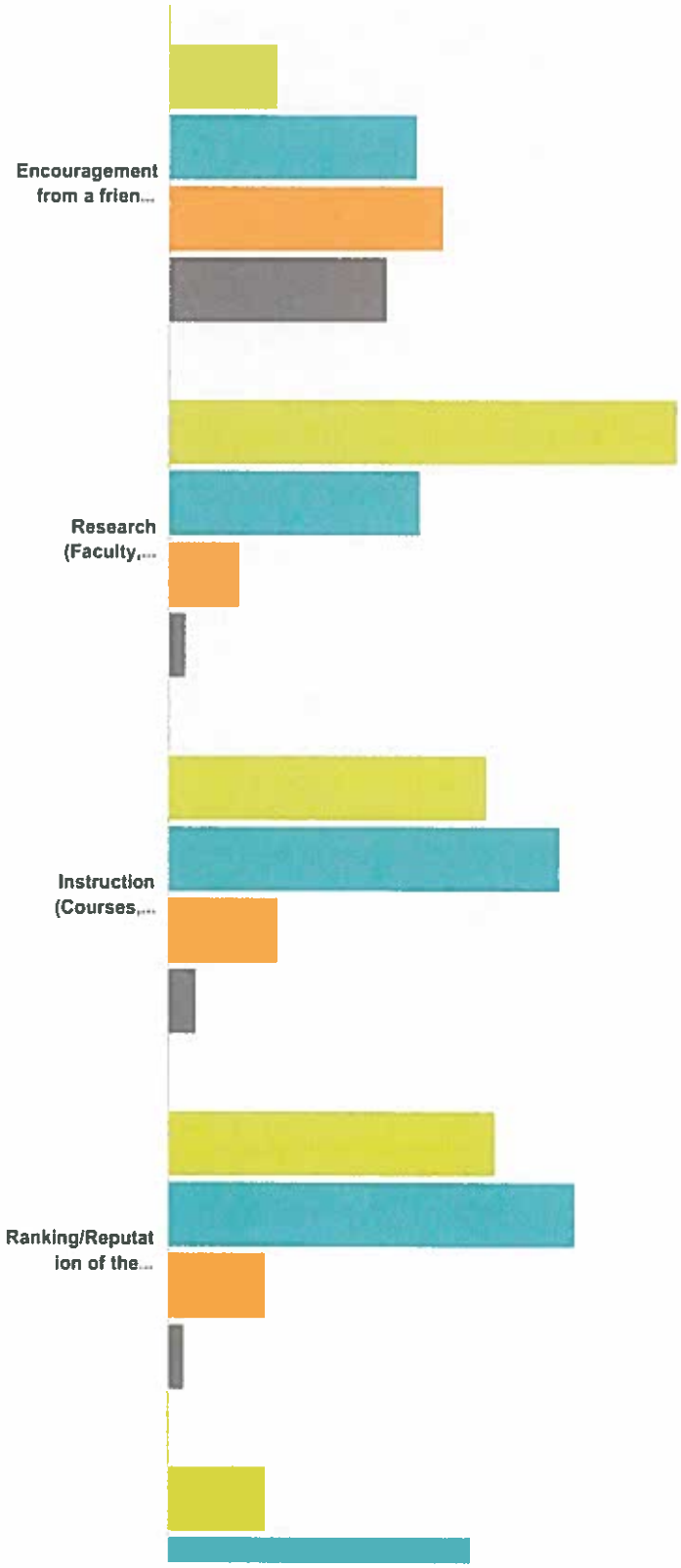
The DE will be housed in the College of Engineering Dean's Office. Existing staff within the Dean's office will provide administrative support for record keeping (e.g., lists of current and former students and current faculty members) and will assist DE program faculty with preparation of materials required for the periodic reviews by the Graduate Council's Program

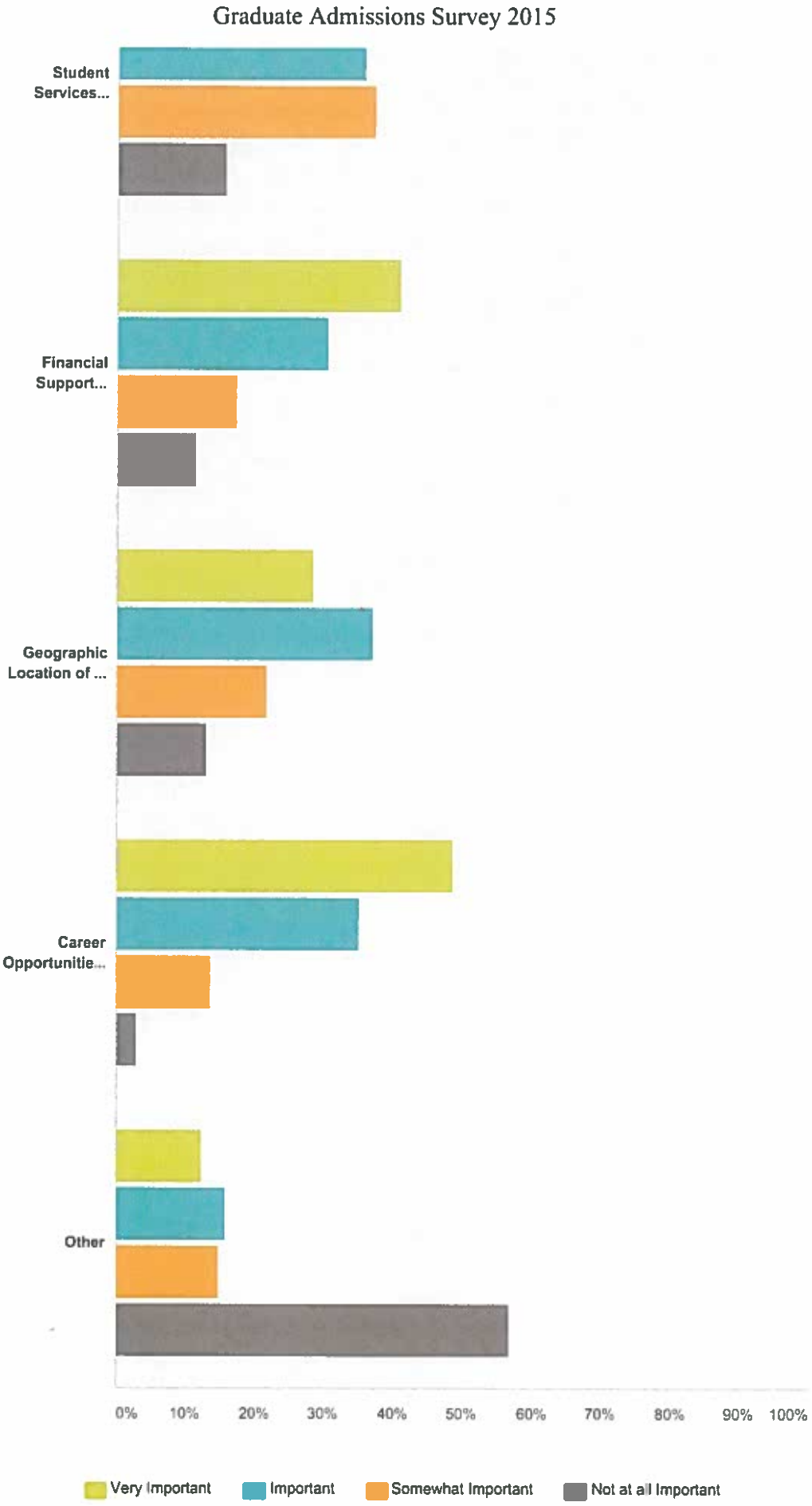
Review Committee. The Dean's Office will also provide technical support for developing and maintaining a web page for the DEEE and for appropriate outreach to potential graduate students. Support for the required curriculum will also be provided.

APPENDIX G:
Graduate Student Admissions Survey

Q1 Why did you apply to UC Davis for graduate study? Please indicate the importance of the following factors in your decision to apply to UC Davis.

Answered: 445 Skipped: 0

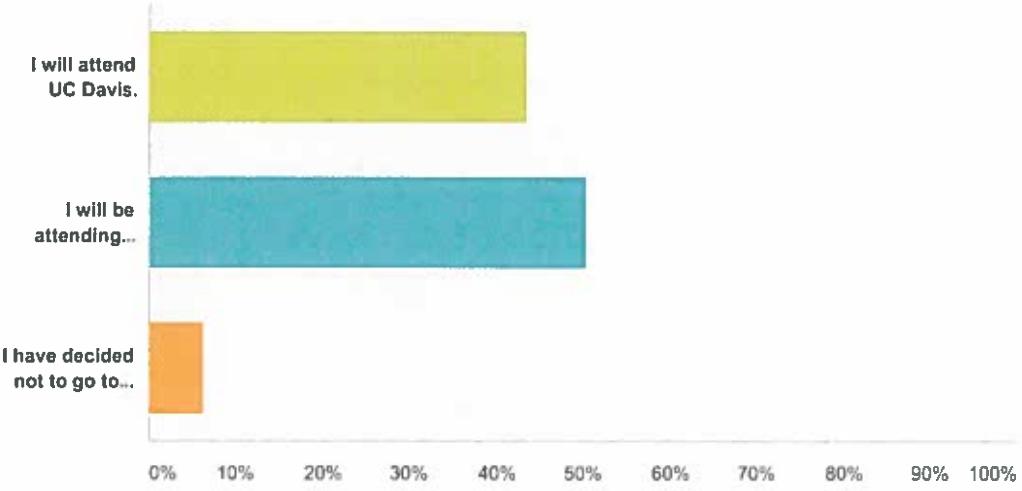



Graduate Admissions Survey 2015
Student Services...
Financial Support...
Geographic Location of ...
Career Opportunitie...
Other
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Very Important
Important
Somewhat Important
Not at all Important

	Very Important	Important	Somewhat Important	Not at all Important	Total
Encouragement from a friend or colleague	**12.81%** 57	**29.21%** 130	**32.36%** 144	**25.62%** 114	445
Research (Faculty, facilities, etc.)	**60.00%** 267	**29.66%** 132	**8.31%** 37	**2.02%** 9	445
Instruction (Courses, curriculum, training program, etc.)	**37.53%** 167	**46.07%** 205	**13.03%** 58	**3.37%** 15	445
Ranking/Reputation of the program and university	**38.65%** 172	**48.09%** 214	**11.46%** 51	**1.80%** 8	445
Student Services (Campus services, engineering services, mentoring)	**11.46%** 51	**35.73%** 159	**37.08%** 165	**15.73%** 70	445
Financial Support (Stipend, Fellowship, Employment)	**40.90%** 182	**30.56%** 136	**17.30%** 77	**11.24%** 50	445
Geographic Location of the city of Davis	**28.31%** 126	**36.85%** 164	**21.80%** 97	**13.03%** 58	445
Career Opportunities after Graduation	**48.54%** 216	**35.06%** 156	**13.48%** 60	**2.92%** 13	445
Other	**12.36%** 55	**15.96%** 71	**14.83%** 66	**56.85%** 253	445

Q2 Please choose which of the following statements applies to you.

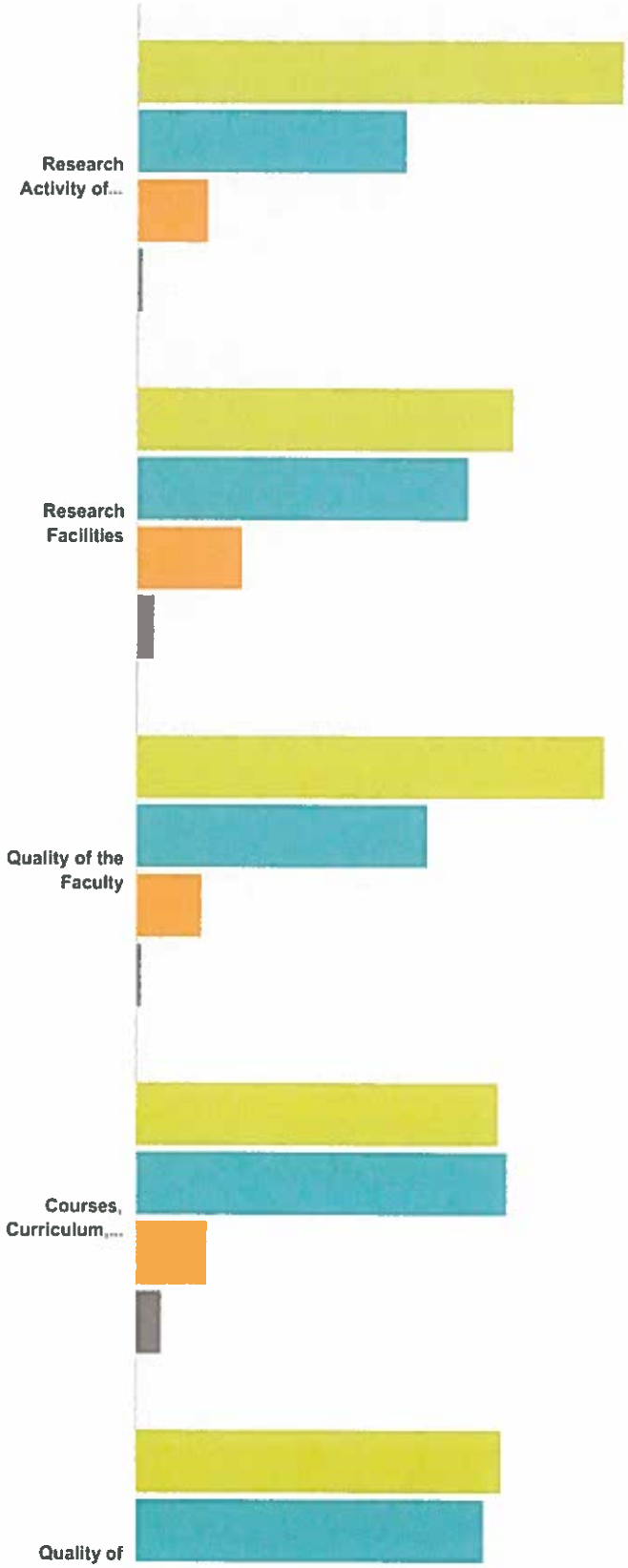
Answered: 445 Skipped: 0

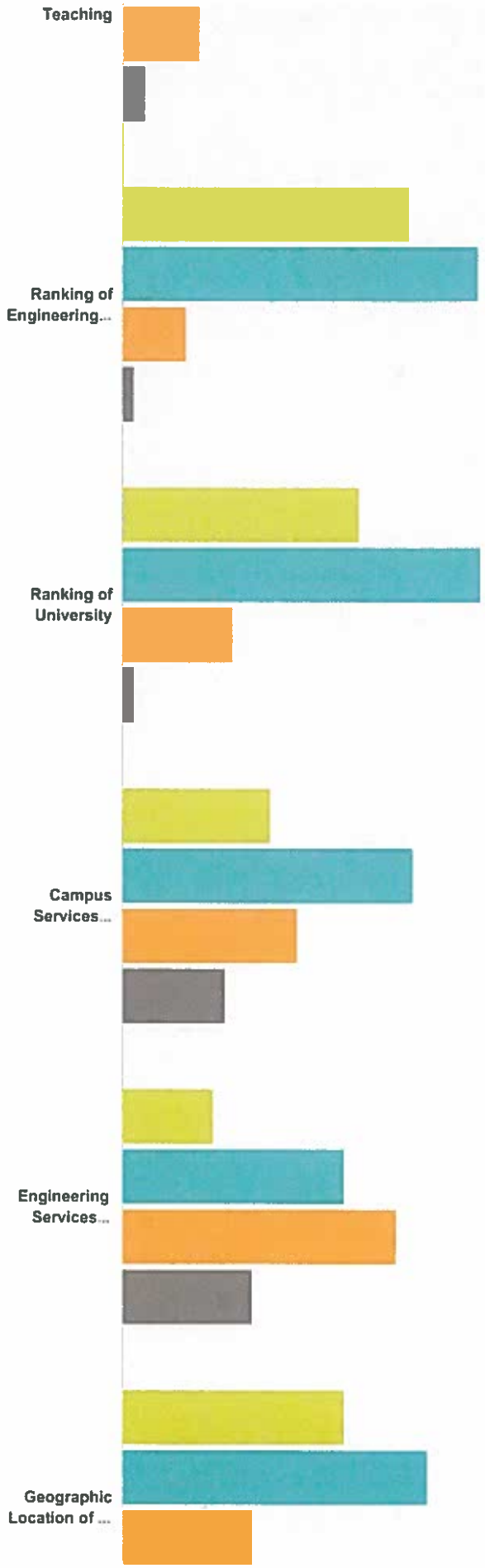


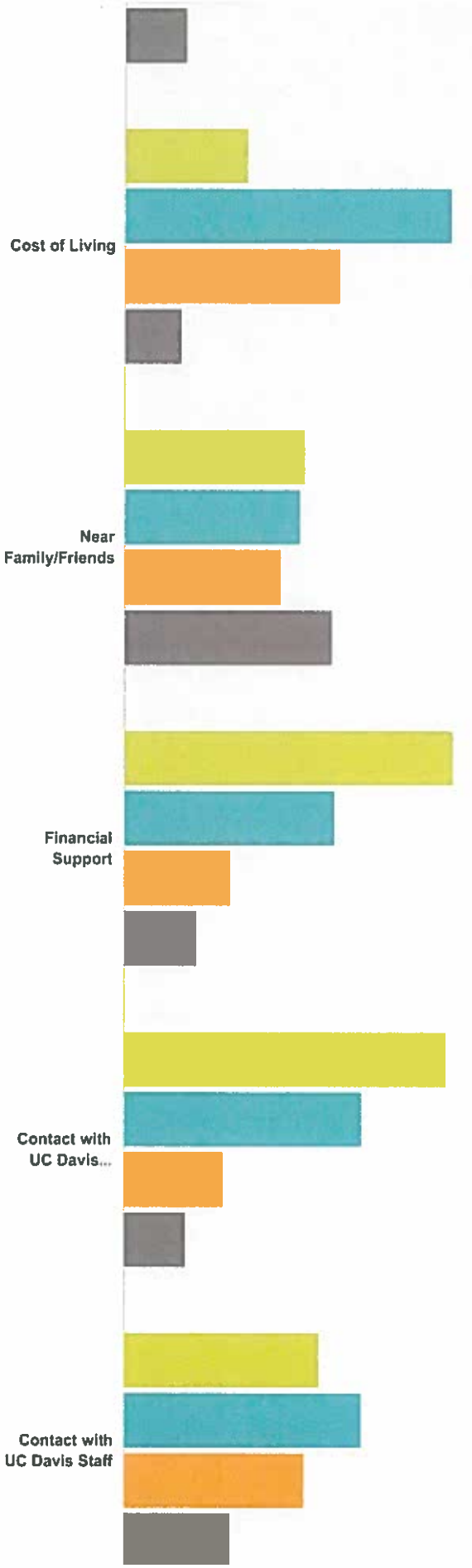
Answer Choices	Responses	
I will attend UC Davis.	**43.37%**	193
I will be attending another institution.	**50.34%**	224
I have decided not to go to graduate school at this time.	**6.29%**	28
Total		**445**

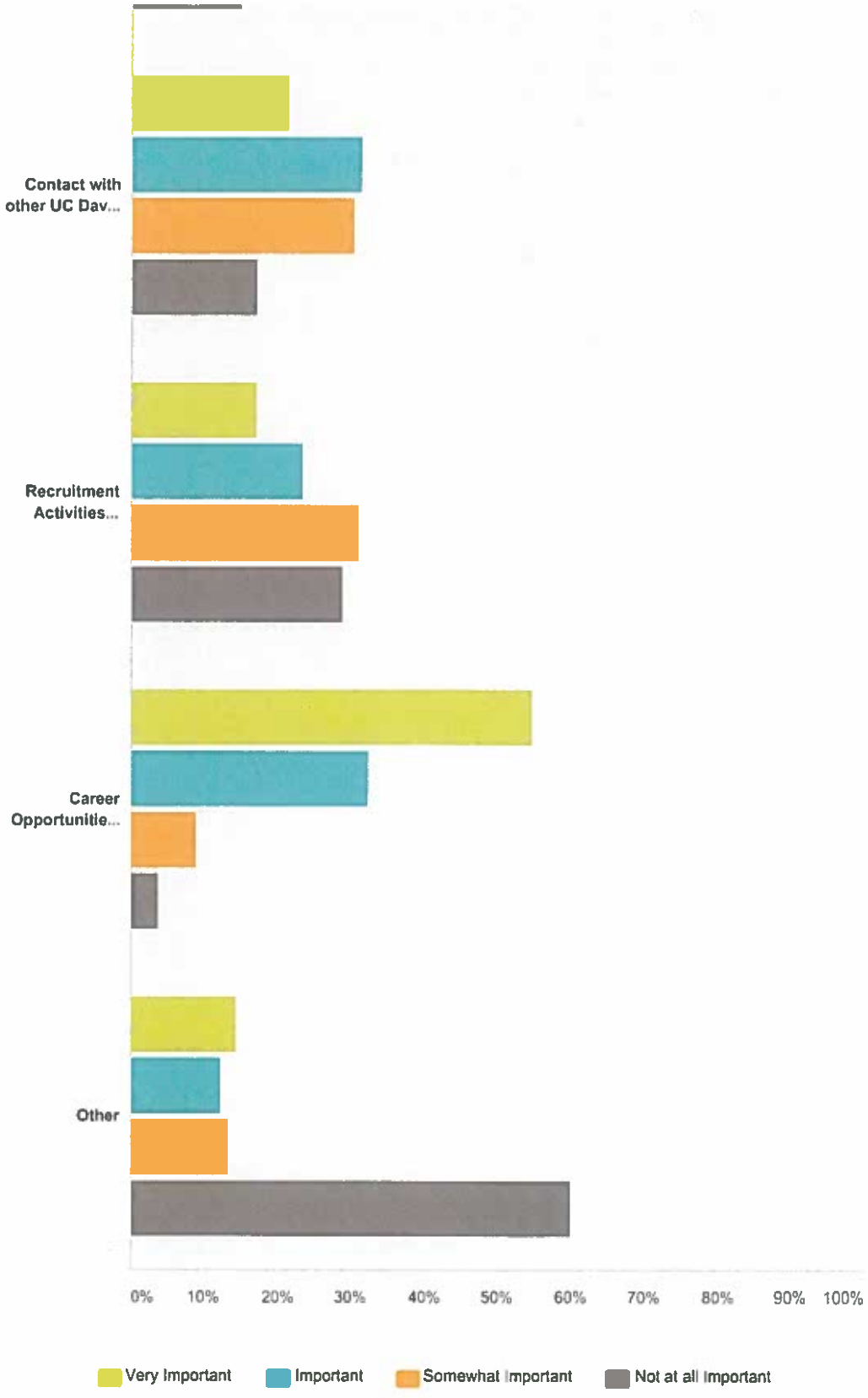
Q3 How important were the following factors in making your decision about attending UC Davis?

Answered: 188 Skipped: 257




Teaching
Ranking of Engineering...
Ranking of University
Campus Services...
Engineering Services...
Geographic Location of ...


Cost of Living
Near Family/Friends
Financial Support
Contact with UC Davis...
Contact with UC Davis Staff

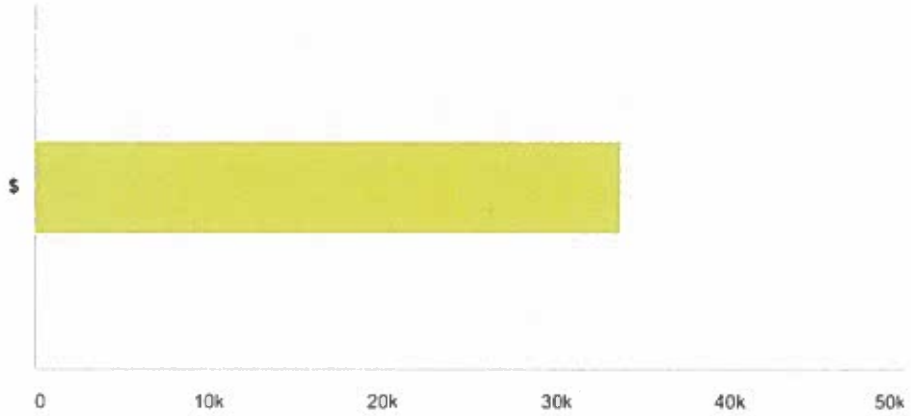


	Very Important	Important	Somewhat Important	Not at all Important	Total
Research Activity of Faculty	**58.51%** 110	**32.45%** 61	**8.51%** 16	**0.53%** 1	188

Research Facilities	**45.21%** 85	**39.89%** 75	**12.77%** 24	**2.13%** 4	188
Quality of the Faculty	**56.38%** 106	**35.11%** 66	**7.98%** 15	**0.53%** 1	188
Courses, Curriculum, Training Program	**43.62%** 82	**44.68%** 84	**8.51%** 16	**3.19%** 6	188
Quality of Teaching	**44.15%** 83	**42.02%** 79	**10.64%** 20	**3.19%** 6	188
Ranking of Engineering Program	**39.89%** 75	**49.47%** 93	**9.04%** 17	**1.60%** 3	188
Ranking of University	**32.98%** 62	**50.00%** 94	**15.43%** 29	**1.60%** 3	188
Campus Services (Computing, libraries, housing, health center, internship and career center)	**20.74%** 39	**40.43%** 76	**24.47%** 46	**14.36%** 27	188
Engineering Services (Student organizations, instructional TV, shop facilities)	**12.77%** 24	**30.85%** 58	**38.30%** 72	**18.09%** 34	188
Geographic Location of the city of Davis	**30.85%** 58	**42.55%** 80	**18.09%** 34	**8.51%** 16	188
Cost of Living	**17.02%** 32	**45.21%** 85	**29.79%** 56	**7.98%** 15	188
Near Family/Friends	**25.00%** 47	**24.47%** 46	**21.81%** 41	**28.72%** 54	188
Financial Support	**45.74%** 86	**29.26%** 55	**14.89%** 28	**10.11%** 19	188
Contact with UC Davis Faculty	**44.68%** 84	**32.98%** 62	**13.83%** 26	**8.51%** 16	188
Contact with UC Davis Staff	**27.13%** 51	**32.98%** 62	**25.00%** 47	**14.89%** 28	188
Contact with other UC Davis graduate students	**21.28%** 40	**31.38%** 59	**30.32%** 57	**17.02%** 32	188
Recruitment Activities (campus visits, dinners, weekend events)	**17.02%** 32	**23.40%** 44	**30.85%** 58	**28.72%** 54	188
Career Opportunities after Graduation	**54.79%** 103	**32.45%** 61	**9.04%** 17	**3.72%** 7	188
Other	**14.36%** 27	**12.23%** 23	**13.30%** 25	**60.11%** 113	188

Q4 Total Offer

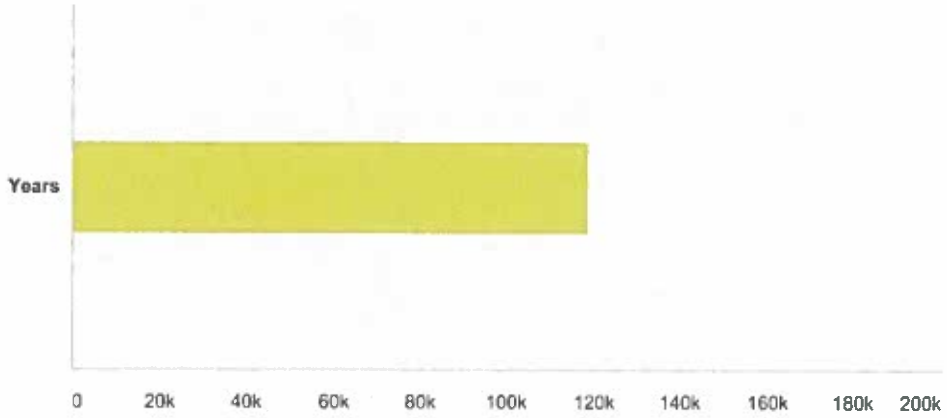
Answered: 170 Skipped: 275



Answer Choices	Average Number	Total Number	Responses
$	33,738	5,735,532	170
Total Respondents: 170			

Q5 Term

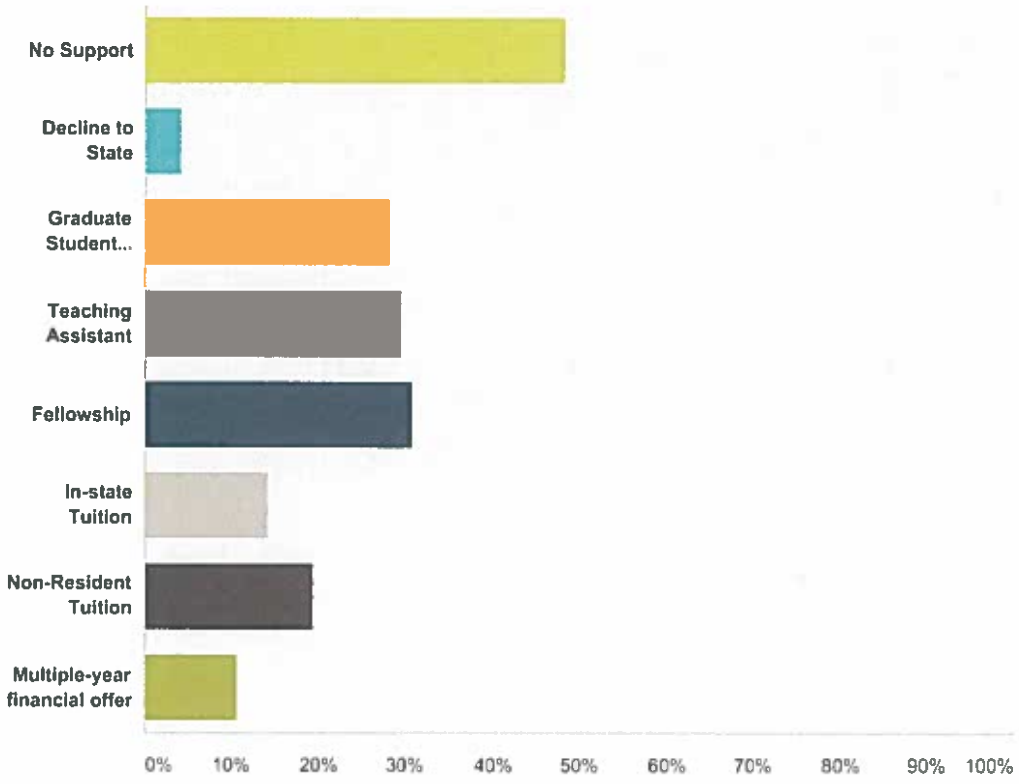
Answered: 170 Skipped: 275



Answer Choices	Average Number	Total Number	Responses
Years	118,743	20,186,317	170
Total Respondents: 170			

Q6 Please indicate the type(s) of support included in your offer from UC Davis (check all that apply).

Answered: 170 Skipped: 275



Answer Choices	Responses	
No Support	48.24%	82
Decline to State	4.12%	7
Graduate Student Researcher	28.24%	48
Teaching Assistant	29.41%	50
Fellowship	30.59%	52
In-state Tuition	14.12%	24
Non-Resident Tuition	19.41%	33
Multiple-year financial offer	10.59%	18
Total Respondents: 170		

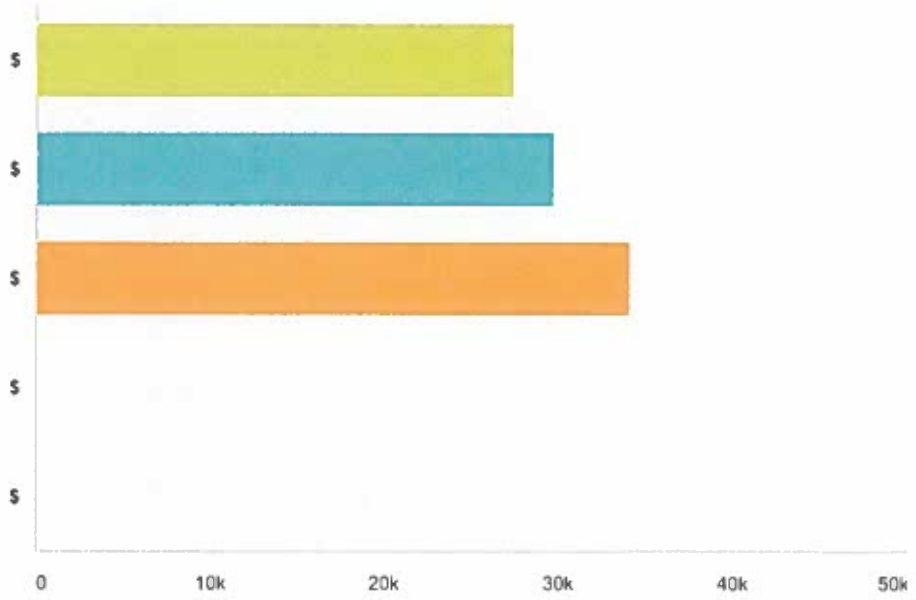
Q7 Institution (please spell out name)

Answered: 63 Skipped: 382

Answer Choices	Responses	
1	100.00%	63
2	52.38%	33
3	25.40%	16
4	12.70%	8
5	11.11%	7

Q8 Total Offer

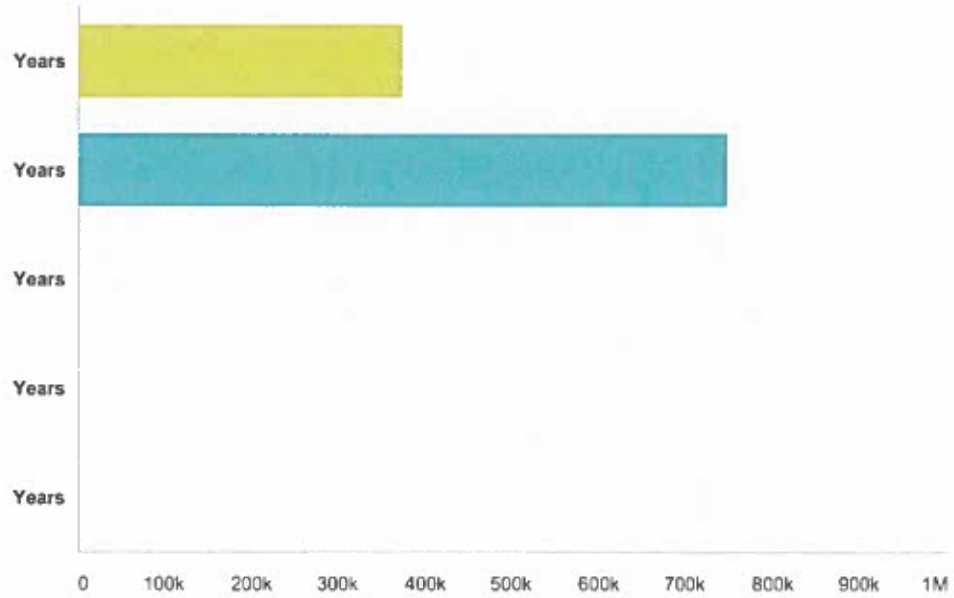
Answered: 56 Skipped: 389



Answer Choices	Average Number	Total Number	Responses
$	27,452	1,537,319	56
$	29,787	834,038	28
$	34,154	444,000	13
$	--	--	6
$	--	--	5
Total Respondents: 56			

Q9 Term

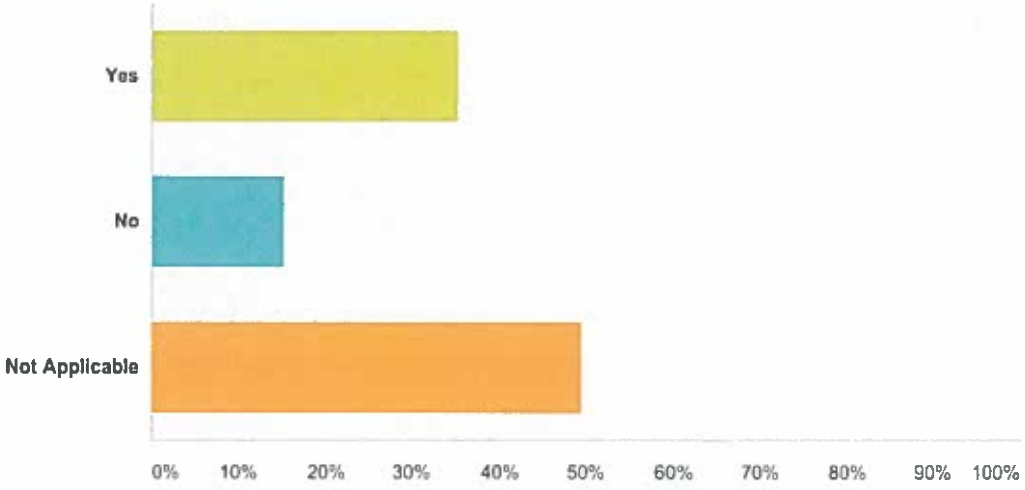
Answered: 54 Skipped: 391



Answer Choices	Average Number	Total Number	Responses
Years	373,298	20,158,113	54
Years	746,447	20,154,064	27
Years	311	4,046	13
Years	673	4,035	6
Years	806	4,030	5
Total Respondents: 54			

Q10 Did you feel that UC Davis' financial offer was competitve to offers received from other institutions?

Answered: 170 Skipped: 275



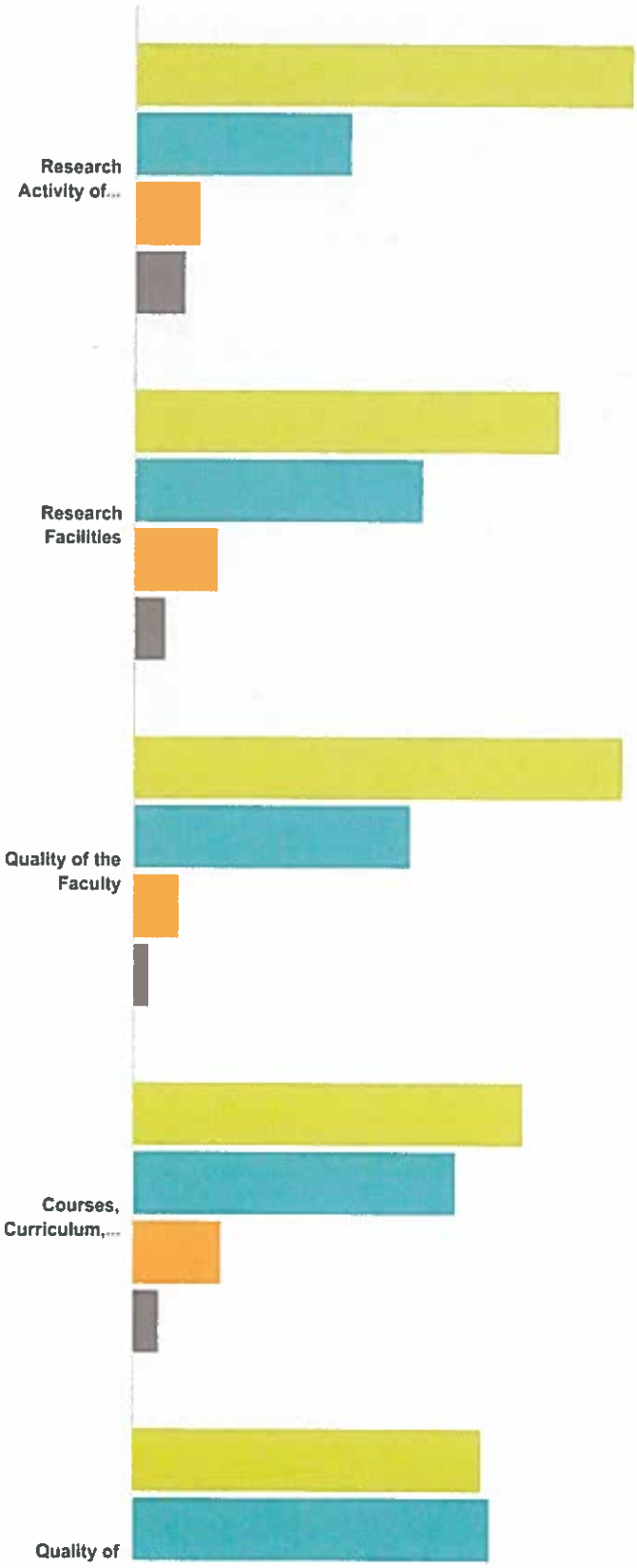
Answer Choices	Responses	
Yes	35.29%	60
No	15.29%	26
Not Applicable	49.41%	84
Total		170

Q11 I decided to enroll in graduate school at the following institution.Please spell out institution name; do not use acronyms.

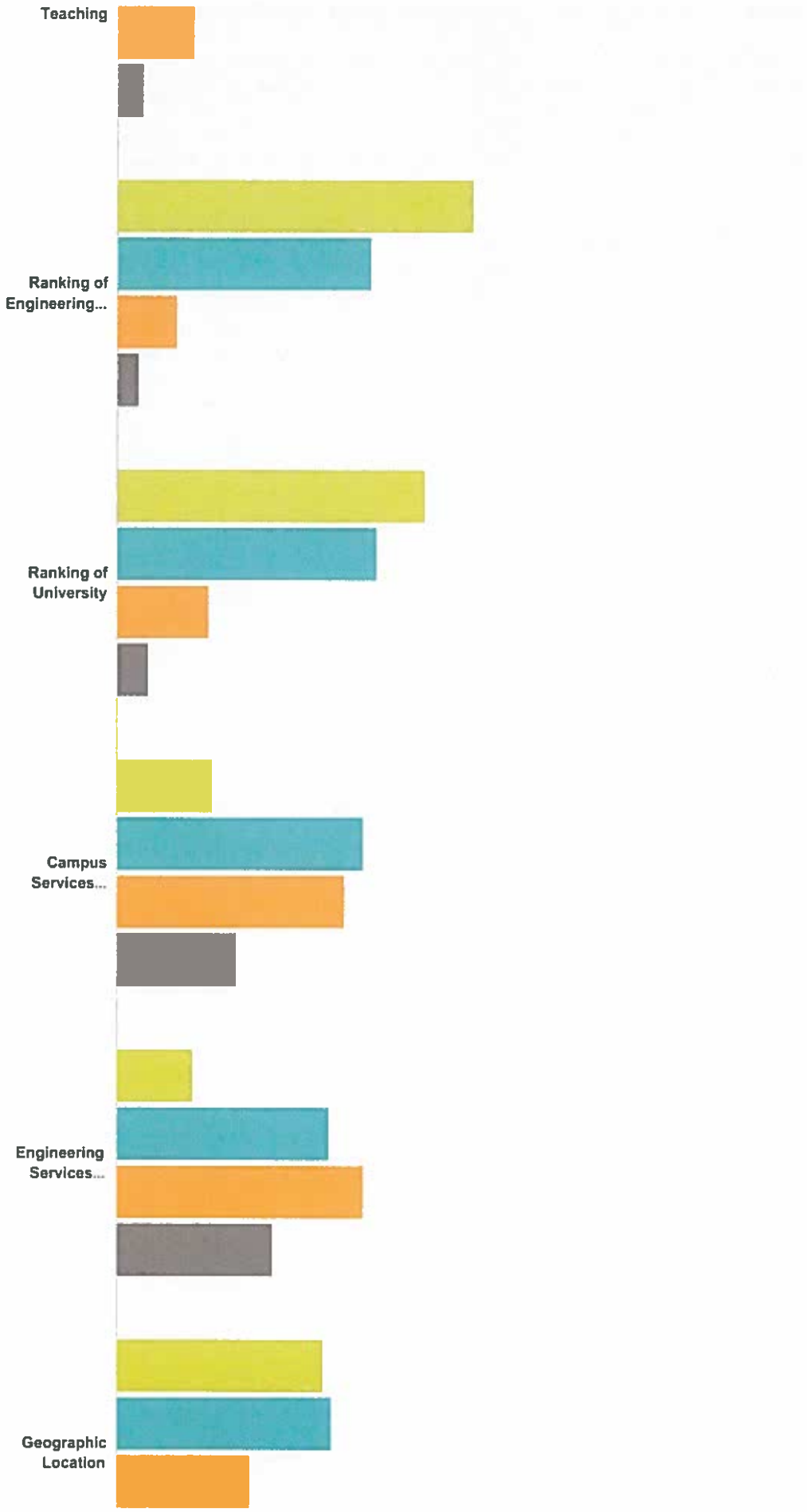
Answered: 220 Skipped: 225

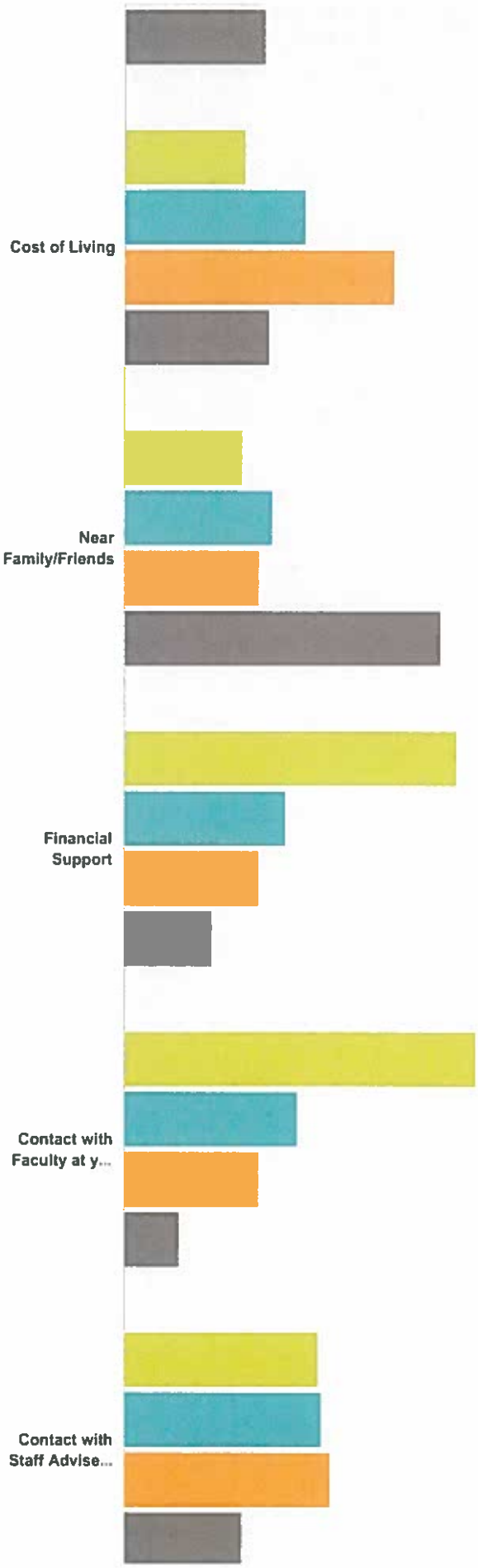
Q12 How important were the following factors in making your decision about attending [Q11]?

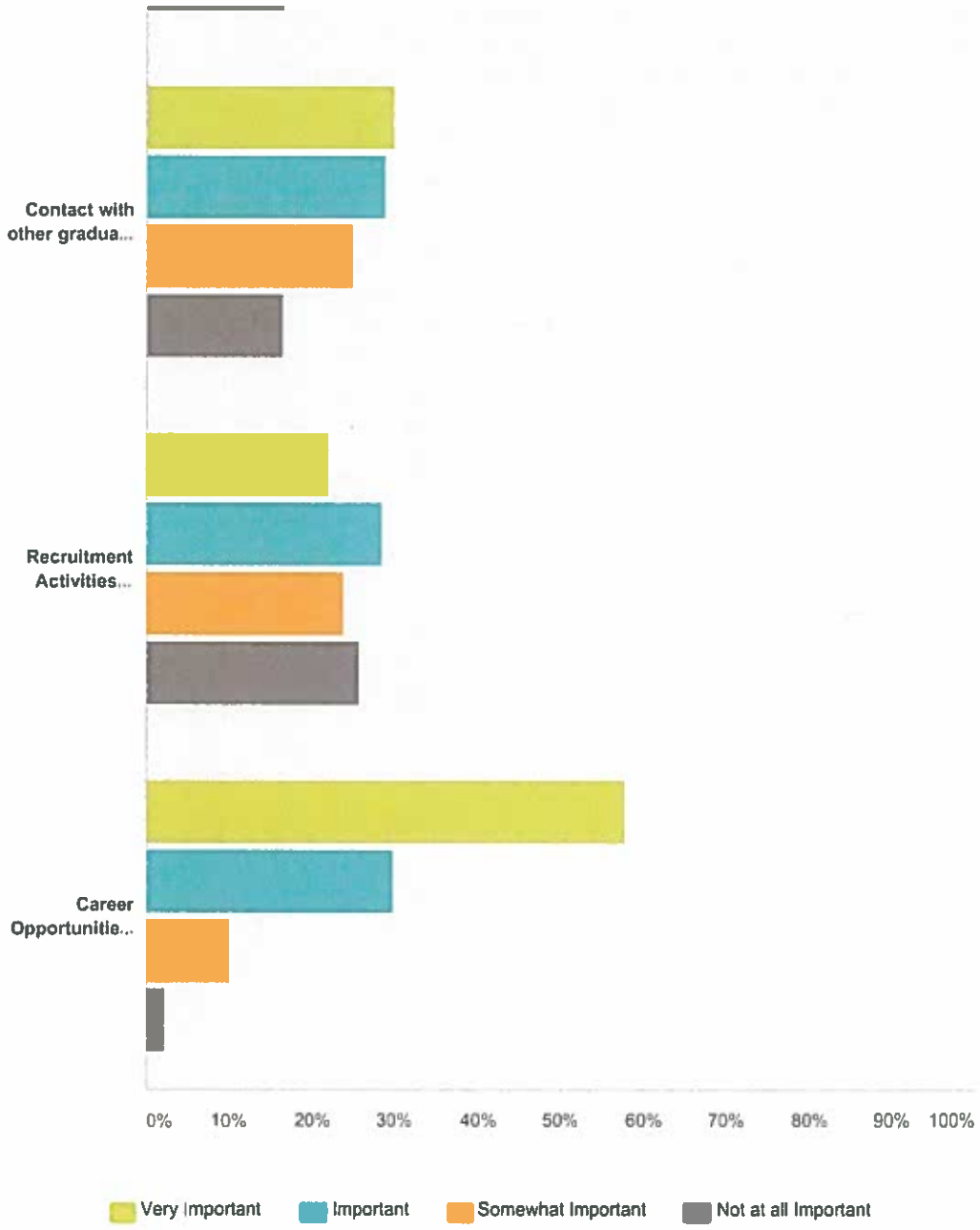
Answered: 218 Skipped: 227



Graduate Admissions Survey 2015




Cost of Living
Near Family/Friends
Financial Support
Contact with Faculty at y...
Contact with Staff Advise...

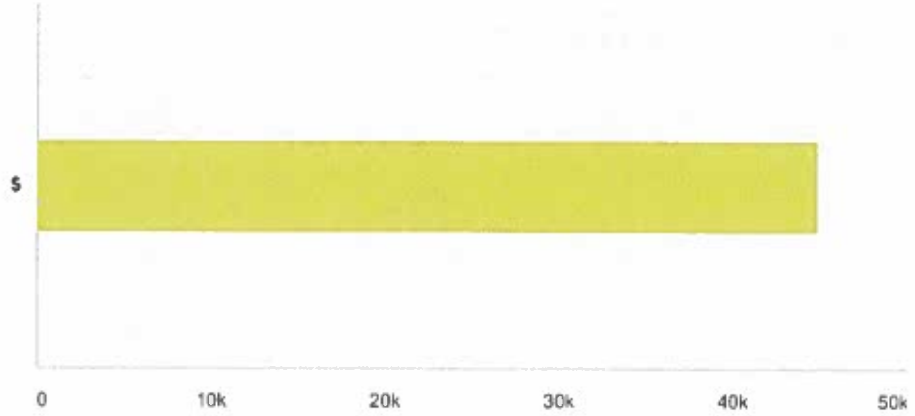


	Very Important	Important	Somewhat Important	Not at all Important	Total
Research Activity of Faculty	**60.09%** 131	**26.15%** 57	**7.80%** 17	**5.96%** 13	218
Research Facilities	**51.38%** 112	**34.86%** 76	**10.09%** 22	**3.67%** 8	218
Quality of the Faculty	**59.17%** 129	**33.49%** 73	**5.50%** 12	**1.83%** 4	218
Courses, Curriculum, Training Program	**47.25%** 103	**38.99%** 85	**10.55%** 23	**3.21%** 7	218
Quality of Teaching	**42.20%** 92	**43.12%** 94	**11.01%** 24	**3.67%** 8	218
Ranking of Engineering Program	**51.38%** 112	**36.70%** 80	**8.72%** 19	**3.21%** 7	218

Ranking of University	**44.50%** 97	**37.61%** 82	**13.30%** 29	**4.59%** 10	218
Campus Services (Computing, libraries, housing, health center, internship and career center)	**13.76%** 30	**35.78%** 78	**33.03%** 72	**17.43%** 38	218
Engineering Services (Student organizations, instructional TV, shop facilities)	**11.01%** 24	**30.73%** 67	**35.78%** 78	**22.48%** 49	218
Geographic Location	**29.82%** 65	**31.19%** 68	**19.27%** 42	**19.72%** 43	218
Cost of Living	**16.97%** 37	**25.23%** 55	**37.61%** 82	**20.18%** 44	218
Near Family/Friends	**16.51%** 36	**20.64%** 45	**18.81%** 41	**44.04%** 96	218
Financial Support	**46.33%** 101	**22.48%** 49	**18.81%** 41	**12.39%** 27	218
Contact with Faculty at your chosen institution	**49.08%** 107	**24.31%** 53	**18.81%** 41	**7.80%** 17	218
Contact with Staff Advisers at your chosen institution	**27.06%** 59	**27.52%** 60	**28.90%** 63	**16.51%** 36	218
Contact with other graduate students at your chosen institution	**29.82%** 65	**28.90%** 63	**24.77%** 54	**16.51%** 36	218
Recruitment Activities (campus visits, dinners, weekend events)	**22.02%** 48	**28.44%** 62	**23.85%** 52	**25.69%** 56	218
Career Opportunities after Graduation	**57.80%** 126	**29.82%** 65	**10.09%** 22	**2.29%** 5	218

Q13 Total Offer

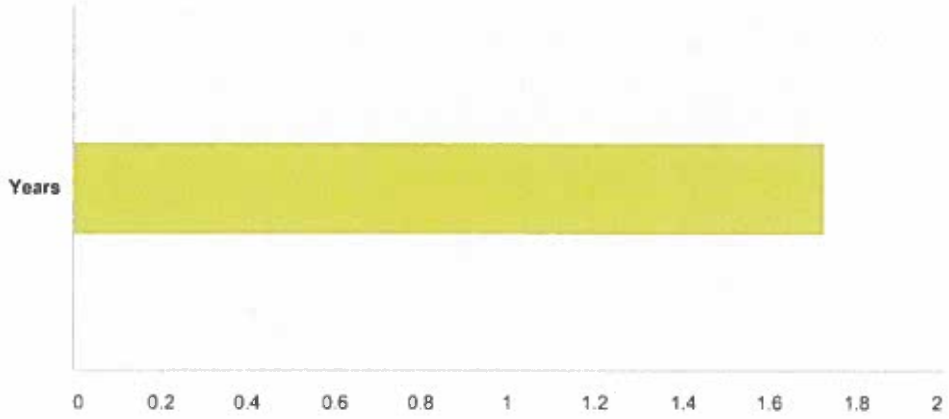
Answered: 178 Skipped: 267



Answer Choices	Average Number	Total Number	Responses
$	44,888	7,990,005	178
Total Respondents: 178			

Q14 Term

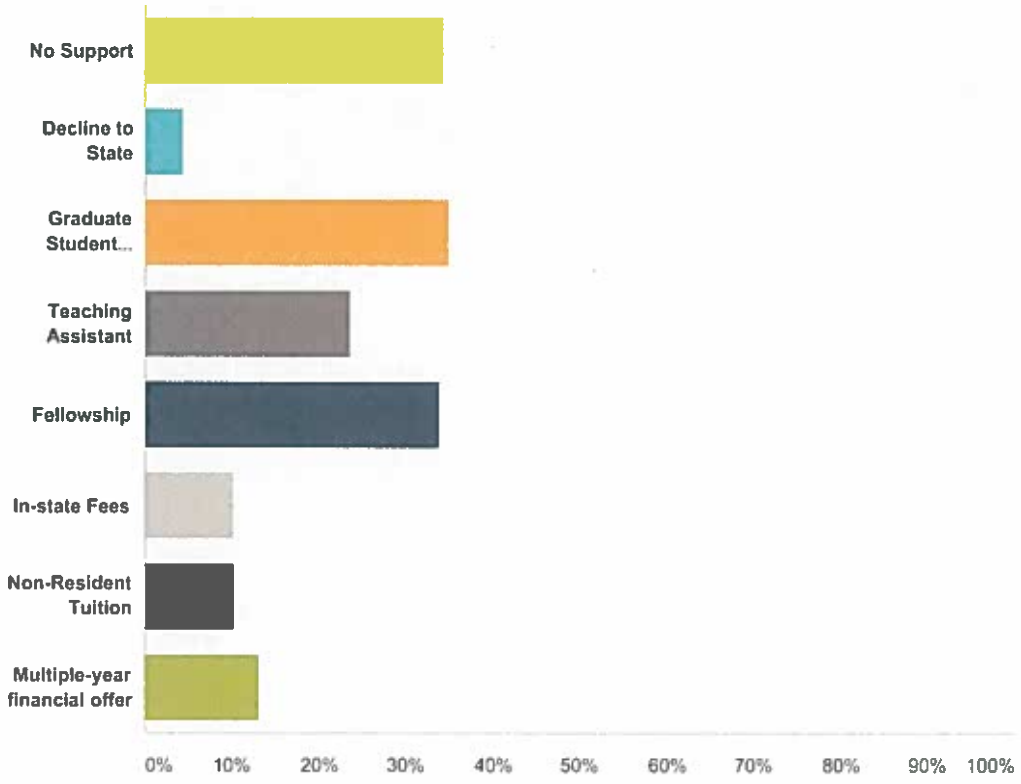
Answered: 174 Skipped: 271



Answer Choices	Average Number	Total Number	Responses
Years	2	301	174
Total Respondents: 174			

Q15 Please indicate the type(s) of support included in your offer from [Q11] (check all that apply).

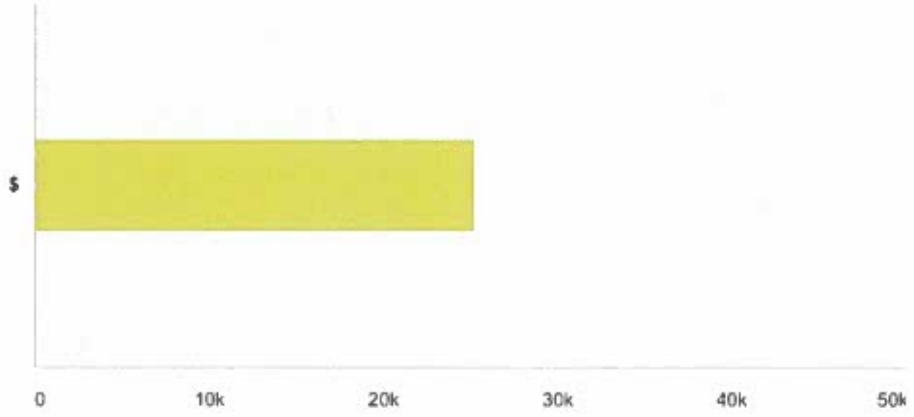
Answered: 204 Skipped: 241



Answer Choices	Responses	
No Support	34.31%	70
Decline to State	4.41%	9
Graduate Student Researcher	34.80%	71
Teaching Assistant	23.53%	48
Fellowship	33.82%	69
In-state Fees	10.29%	21
Non-Resident Tuition	10.29%	21
Multiple-year financial offer	13.24%	27
Total Respondents: 204		

Q16 Total Offer

Answered: 204 Skipped: 241



Answer Choices	Average Number	Total Number	Responses
$	25,271	5,155,361	204
Total Respondents: 204			

Q17 Term

Answered: 204 Skipped: 241

Answer Choices	Average Number	Total Number	Responses
Years	11	2,241	204
Total Respondents: 204			

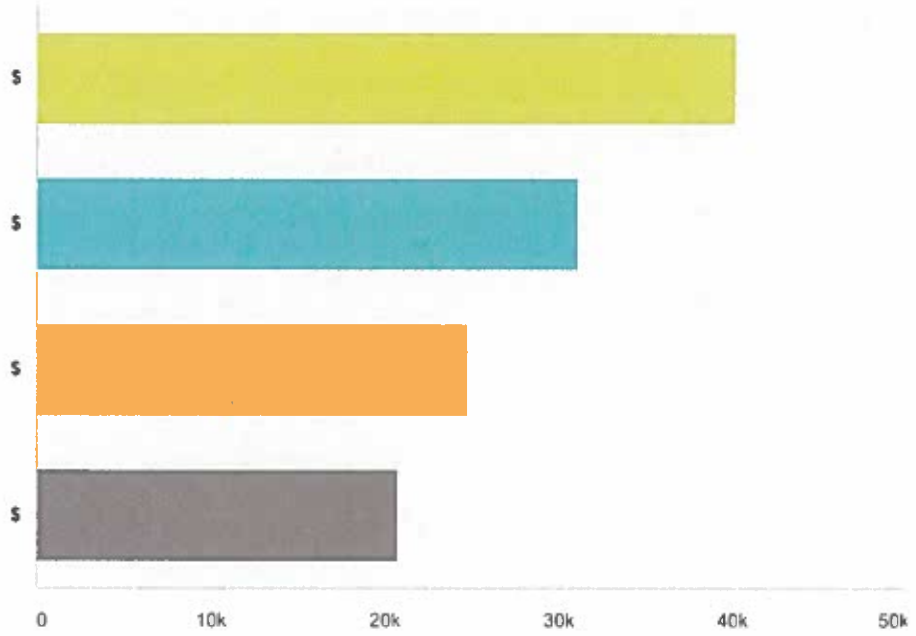
Q18 Institution (please spell out name)

Answered: 73 Skipped: 372

Answer Choices	Responses	
2	100.00%	73
3	69.86%	51
4	38.36%	28
5	21.92%	16

Q19 Total Offer

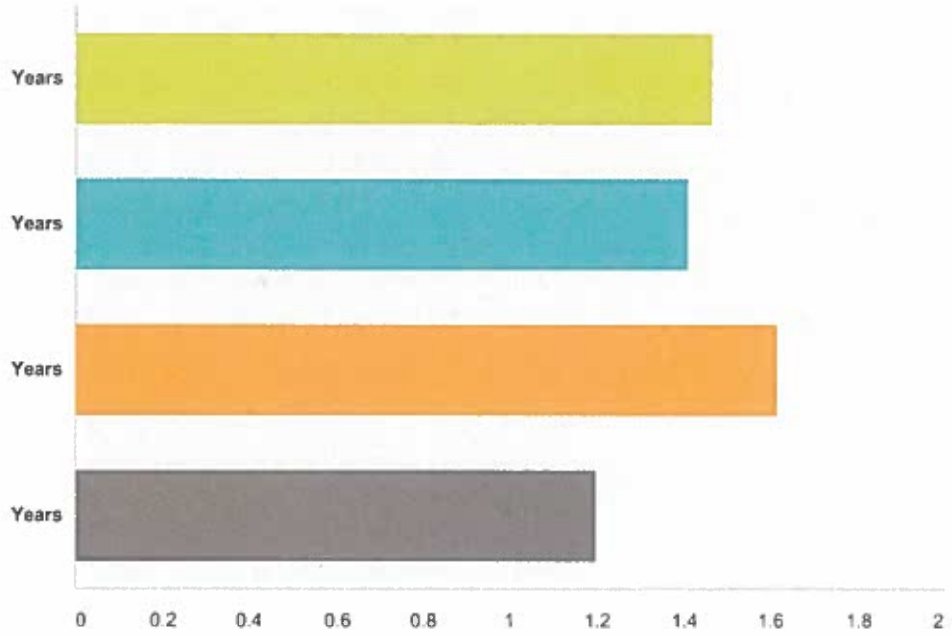
Answered: 70 Skipped: 375



Answer Choices	Average Number	Total Number	Responses
$	40,165	2,812,965	70
$	31,083	1,492,003	48
$	24,709	667,150	27
$	20,813	333,000	16
Total Respondents: 70			

Q20 Term

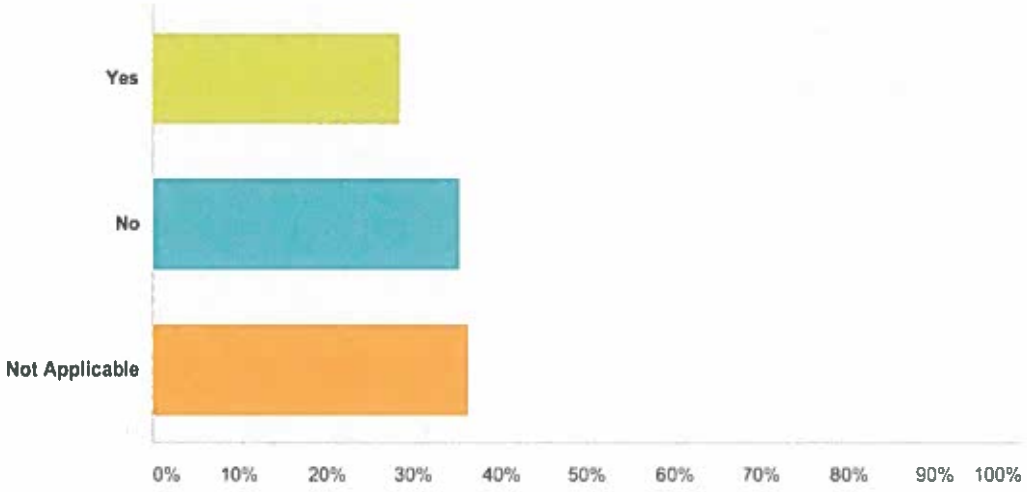
Answered: 69 Skipped: 376



Answer Choices	Average Number	Total Number	Responses
Years	1	101	69
Years	1	65	46
Years	2	42	26
Years	1	18	15
Total Respondents: 69			

Q21 Did you feel that UC Davis' financial offer was competitve to offers received from other institutions?

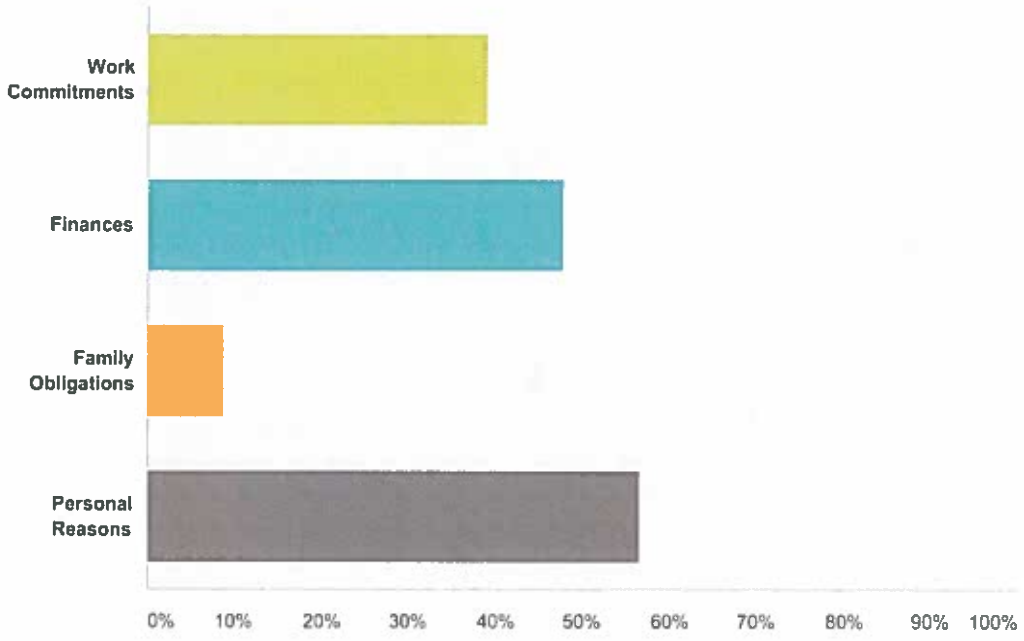
Answered: 204 Skipped: 241



Answer Choices	Responses	
Yes	28.43%	58
No	35.29%	72
Not Applicable	36.27%	74
Total		204

Q22 Please indicate why you have decided not to go to graduate school at this time (check all that apply).

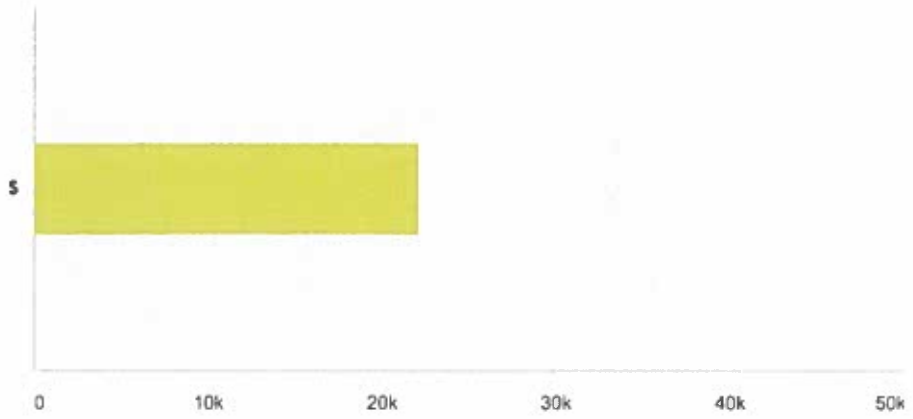
Answered: 23 Skipped: 422



Answer Choices	Responses	
Work Commitments	39.13%	9
Finances	47.83%	11
Family Obligations	8.70%	2
Personal Reasons	56.52%	13
Total Respondents: 23		

Q23 Total Offer

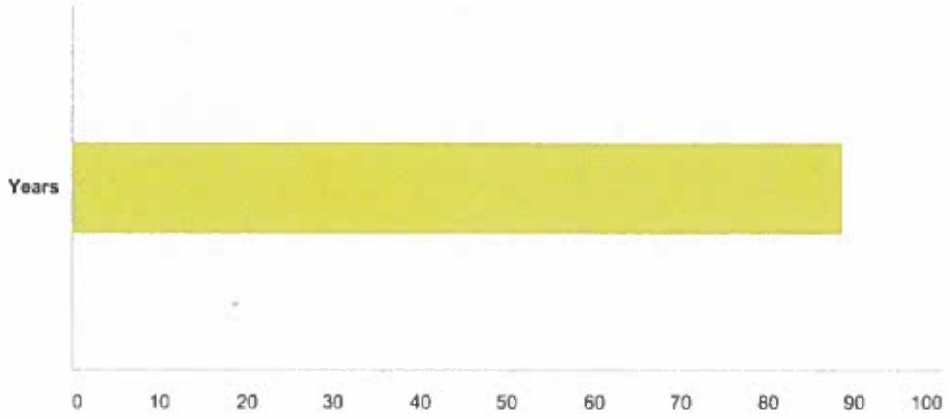
Answered: 23 Skipped: 422



Answer Choices	Average Number	Total Number	Responses
$	22,128	508,944	23
Total Respondents: 23			

Q24 Term

Answered: 23 Skipped: 422



Answer Choices	Average Number	Total Number	Responses
Years	89	2,040	23
Total Respondents: 23			

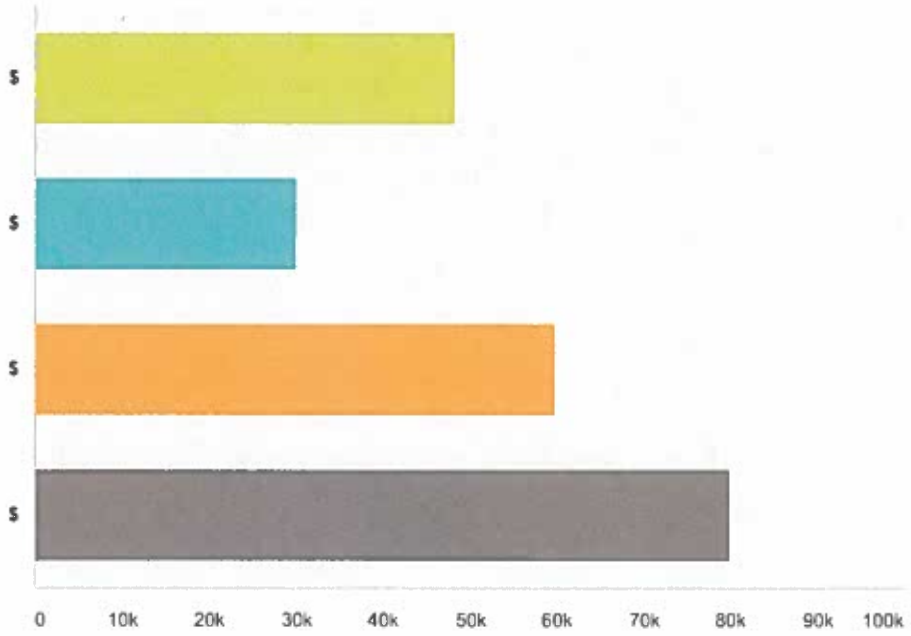
Q25 Institution (please spell out name)

Answered: 6 Skipped: 439

Answer Choices	Responses	
2	100.00%	6
3	33.33%	2
4	16.67%	1
5	16.67%	1

Q26 Total Offer

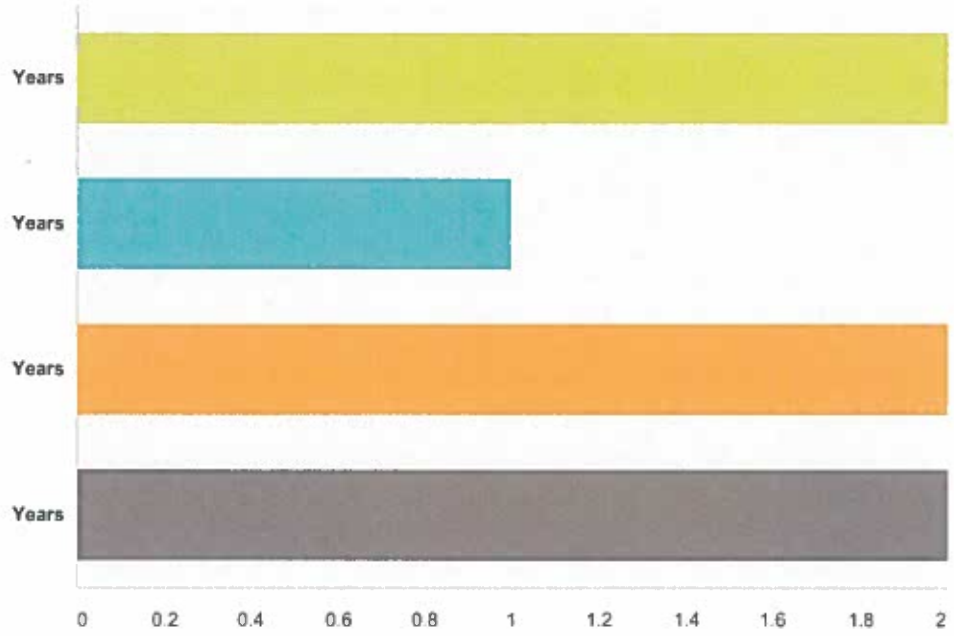
Answered: 6 Skipped: 439



Answer Choices	Average Number	Total Number	Responses
$	48,167	289,000	6
$	30,000	60,000	2
$	60,000	60,000	1
$	80,000	80,000	1
Total Respondents: 6			

Q27 Term

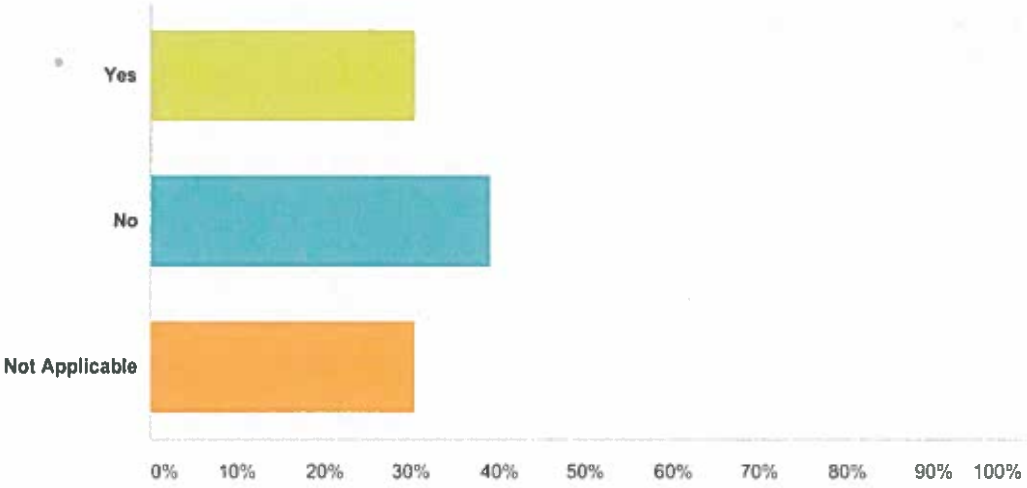
Answered: 5 Skipped: 440



Answer Choices	Average Number	Total Number	Responses
Years	2	10	5
Years	1	2	2
Years	2	2	1
Years	2	2	1
Total Respondents: 5			

Q28 Did you feel that UC Davis' financial offer was competitve to offers received from other institutions?

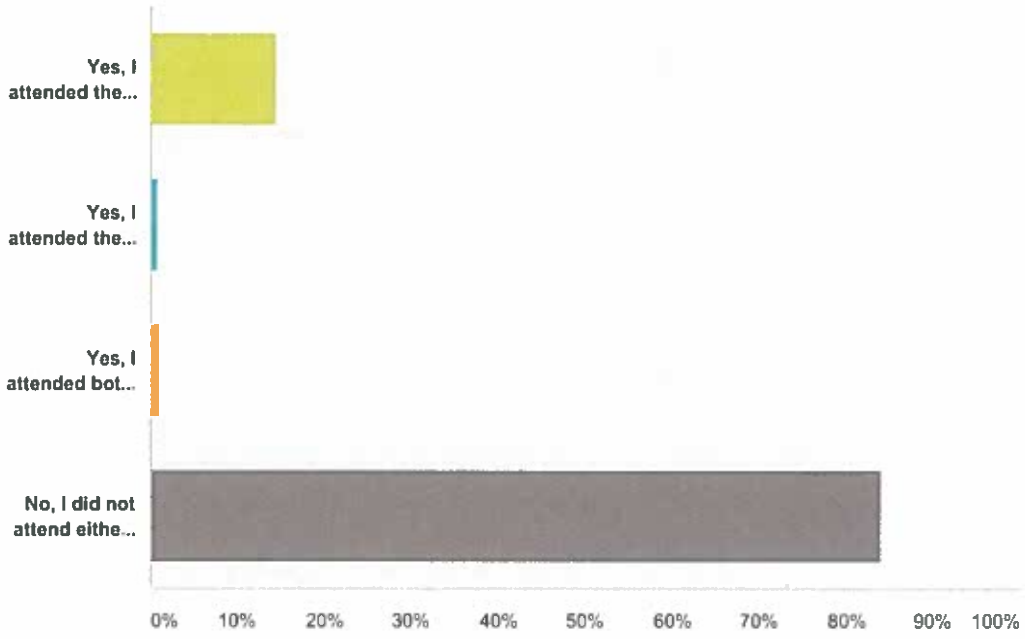
Answered: 23 Skipped: 422



Answer Choices	Responses	
Yes	30.43%	7
No	39.13%	9
Not Applicable	30.43%	7
Total		23

Q29 Did you attend the department or engineering recruitment weekend event?

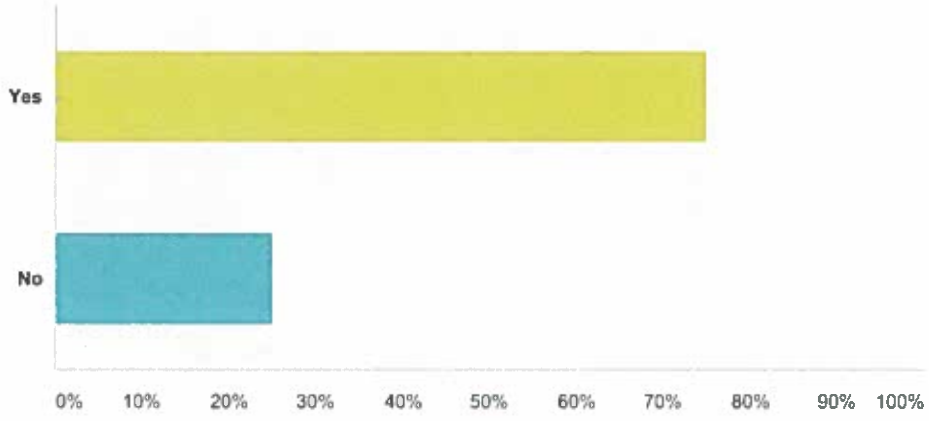
Answered: 396 Skipped: 49



Answer Choices	Responses	
Yes, I attended the department's weekend recruitment activities.	14.39%	57
Yes, I attended the college's weekend recruitment activities.	0.76%	3
Yes, I attended both events.	1.01%	4
No, I did not attend either event.	83.84%	332
Total		**396**

Q30 Did UC Davis provide financial assistance for your travel to Davis?

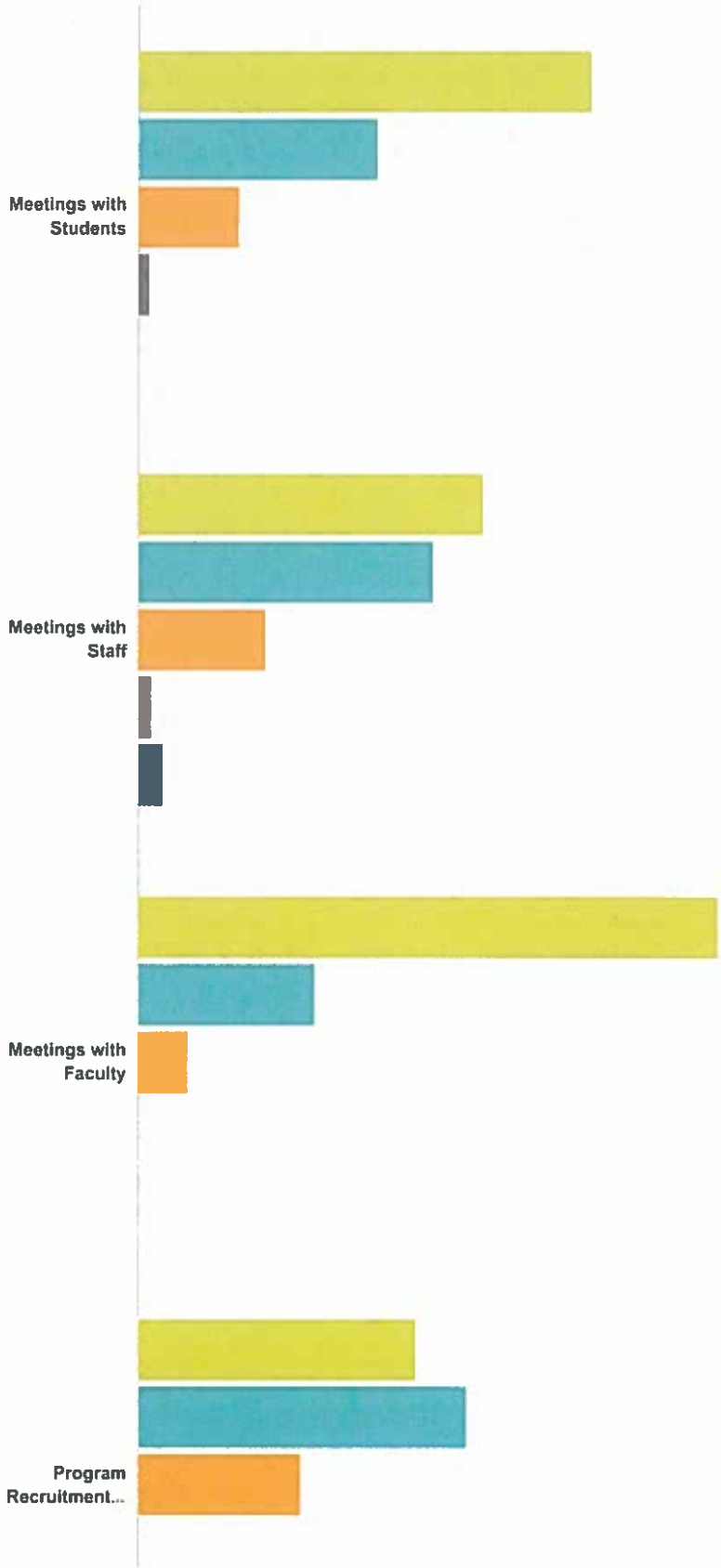
Answered: 64 Skipped: 381

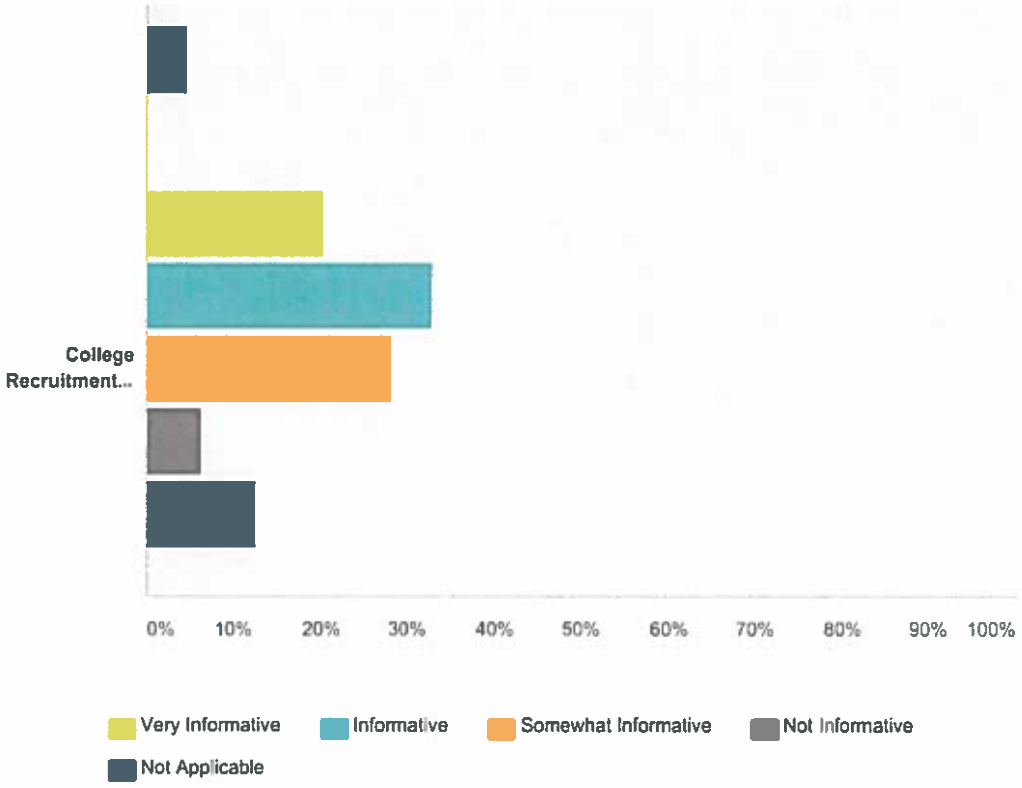


Answer Choices	Responses	
Yes	75.00%	48
No	25.00%	16
Total		64

Q31 What activities did you find informative?

Answered: 64 Skipped: 381

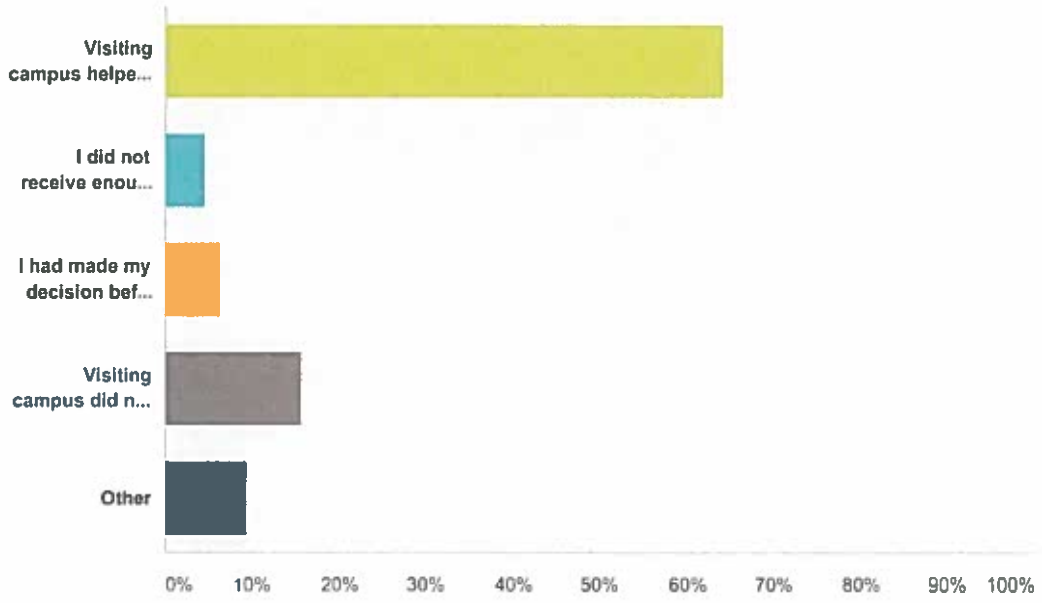




	Very Informative	Informative	Somewhat Informative	Not Informative	Not Applicable	Total
Meetings with Students	**56.25%** 36	**29.69%** 19	**12.50%** 8	**1.56%** 1	**0.00%** 0	64
Meetings with Staff	**42.86%** 27	**36.51%** 23	**15.87%** 10	**1.59%** 1	**3.17%** 2	63
Meetings with Faculty	**71.88%** 46	**21.88%** 14	**6.25%** 4	**0.00%** 0	**0.00%** 0	64
Program Recruitment Activities	**34.38%** 22	**40.63%** 26	**20.31%** 13	**0.00%** 0	**4.69%** 3	64
College Recruitment Activities	**20.31%** 13	**32.81%** 21	**28.13%** 18	**6.25%** 4	**12.50%** 8	64

Q32 Which statement summarizes your experience visiting UC Davis?

Answered: 64 Skipped: 381



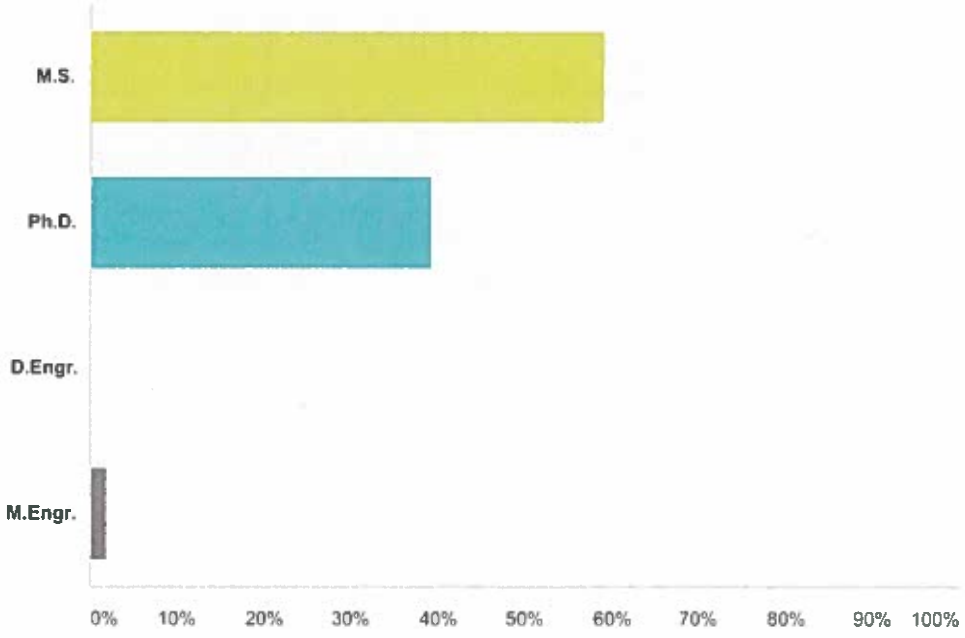
Answer Choices	Responses	
Visiting campus helped finalize my decision.	64.06%	41
I did not receive enough information to make a decision about UC Davis.	4.69%	3
I had made my decision before visiting UC Davis.	6.25%	4
Visiting campus did not influence my decision about UC Davis.	15.63%	10
Other	9.38%	6
Total		64

Q33 What other information or activities would you have liked to experience during your visit?

Answered: 12 Skipped: 433

Q34 UC Davis Admitted Degree Objective

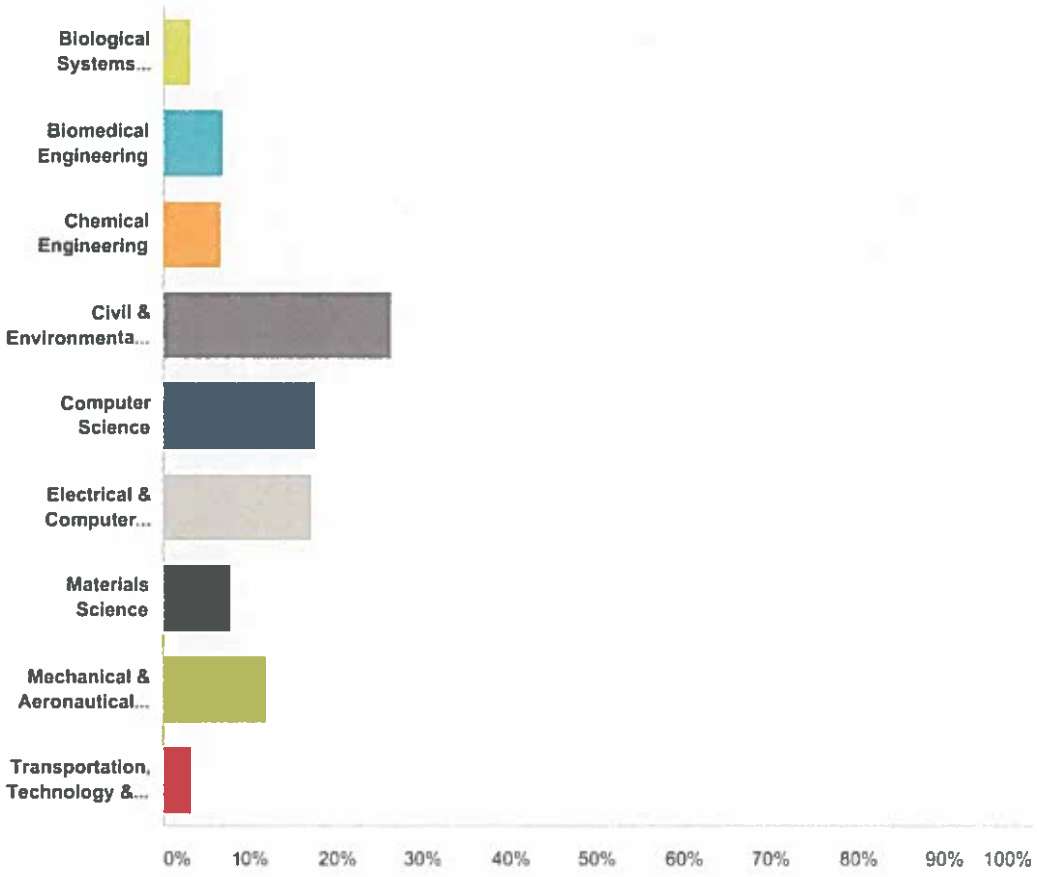
Answered: 393 Skipped: 52



Answer Choices	Responses	
M.S.	59.03%	232
Ph.D.	39.19%	154
D.Engr.	0.00%	0
M.Engr.	1.78%	7
Total		393

Q35 UC Davis Admitted Graduate Program

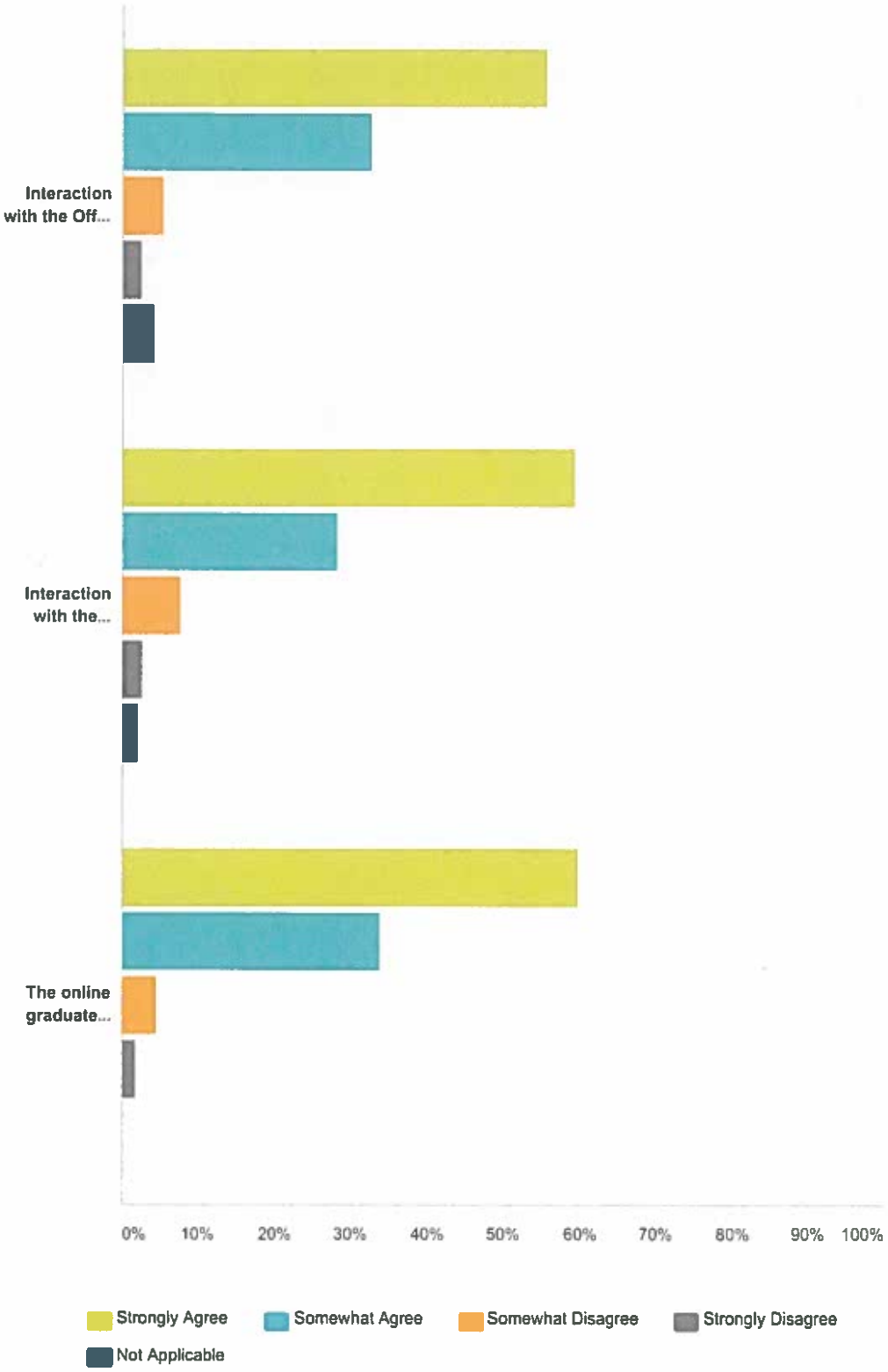
Answered: 393 Skipped: 52



Answer Choices	Responses	
Biological Systems Engineering	3.05%	12
Biomedical Engineering	6.87%	27
Chemical Engineering	6.62%	26
Civil & Environmental Engineering	26.21%	103
Computer Science	17.56%	69
Electrical & Computer Engineering	17.05%	67
Materials Science	7.63%	30
Mechanical & Aeronautical Engineering	11.96%	47
Transportation, Technology & Policy	3.05%	12
Total		393

Q36 Quality of the Graduate Admissions Process

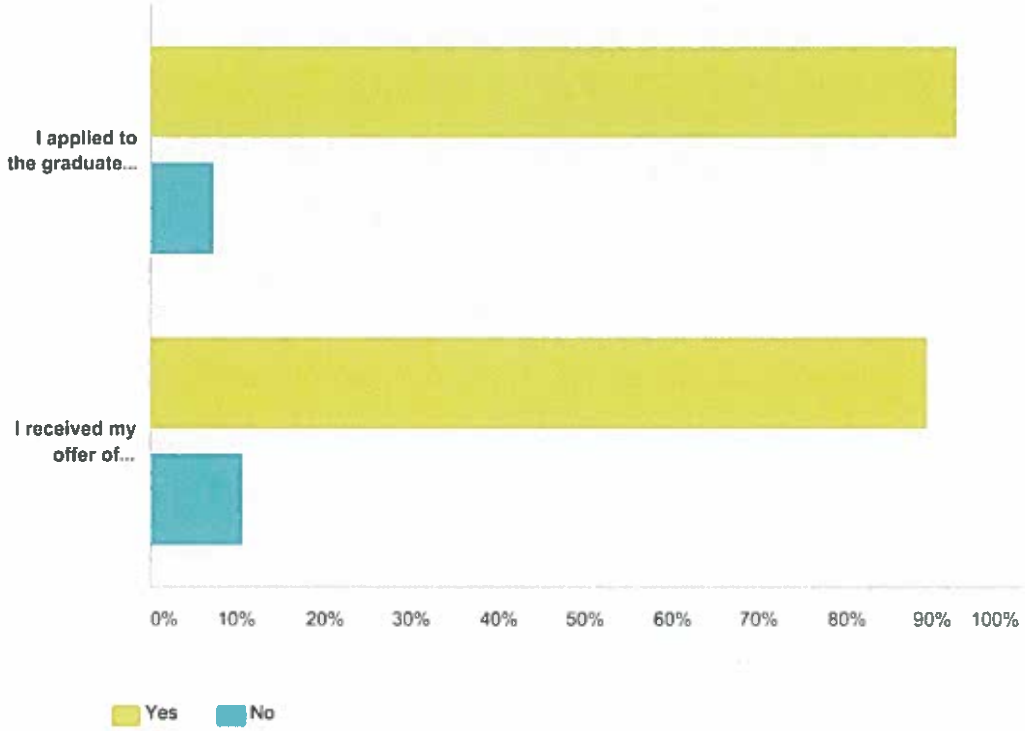
Answered: 393 Skipped: 52



	Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree	Not Applicable	Total
Interaction with the Office of Graduate Studies was timely, clear, informative, courteous and professional.	**55.47%** 218	**32.57%** 128	**5.34%** 21	**2.54%** 10	**4.07%** 16	393
Interaction with the program I applied to was timely, clear, informative, courteous and professional.	**59.29%** 233	**28.24%** 111	**7.63%** 30	**2.80%** 11	**2.04%** 8	393
The online graduate application system was clear, informative and easy to navigate.	**59.80%** 235	**33.84%** 133	**4.58%** 18	**1.78%** 7	**0.00%** 0	393

Q37 Admissions Timeline

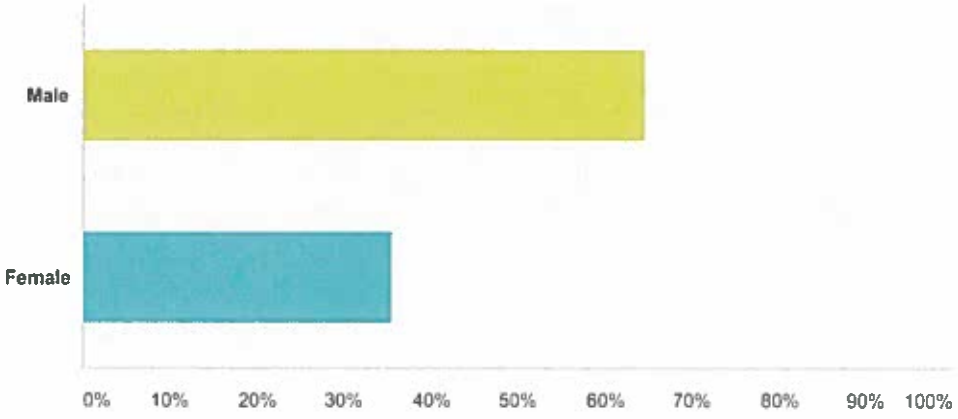
Answered: 393 Skipped: 52



	Yes	No	Total
I applied to the graduate program on or before January 15th.	**92.62%** 364	**7.38%** 29	393
I received my offer of admission to UC Davis by April 15th.	**89.31%** 351	**10.69%** 42	393

Q38 Gender

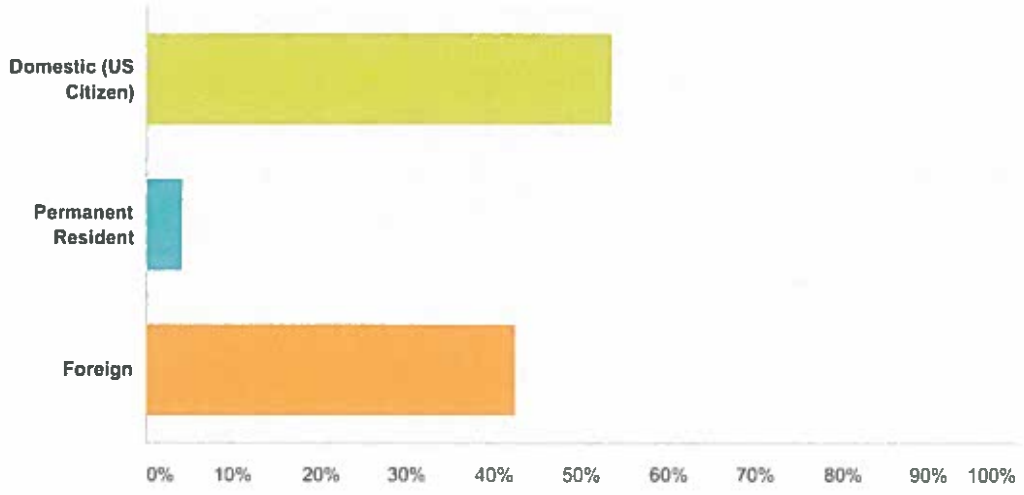
Answered: 389 Skipped: 56



Answer Choices	Responses	
Male	64.52%	251
Female	35.48%	138
Total		389

Q39 Citizenship

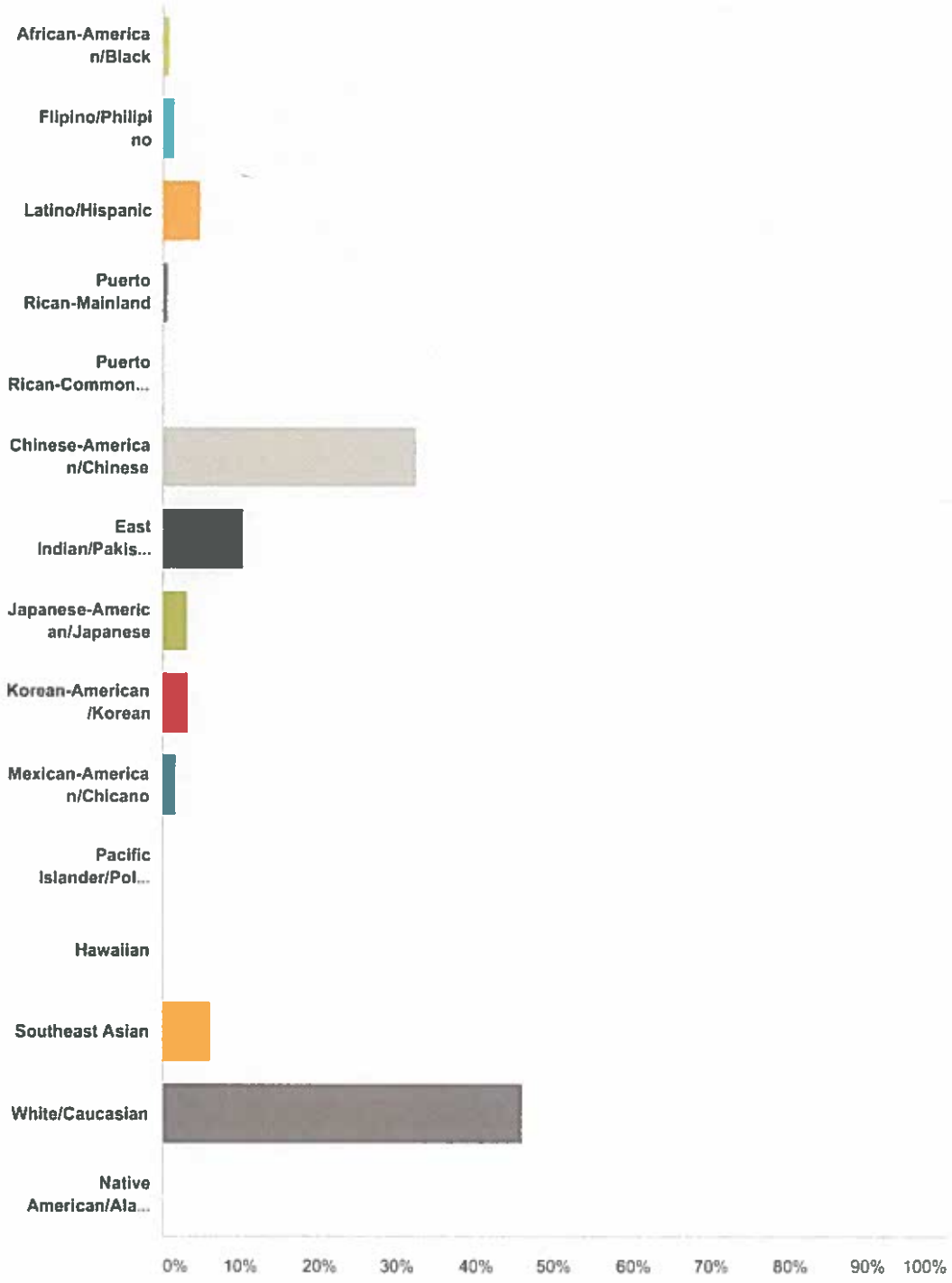
Answered: 387 Skipped: 58



Answer Choices	Responses	
Domestic (US Citizen)	53.49%	207
Permanent Resident	4.13%	16
Foreign	42.38%	164
Total		387

Q40 Ethnicity (check all that apply)

Answered: 361 Skipped: 84



Answer Choices	Responses	
African-American/Black	0.83%	3
Filipino/Philipino	1.39%	5
Latino/Hispanic	4.71%	17

Puerto Rican-Mainland	0.55%	2
Puerto Rican-Commonwealth	0.28%	1
Chinese-American/Chinese	32.41%	117
East Indian/Pakistani	10.25%	37
Japanese-American/Japanese	3.05%	11
Korean-American/Korean	3.05%	11
Mexican-American/Chicano	1.66%	6
Pacific Islander/Polynesian	0.00%	0
Hawaiian	0.00%	0
Southeast Asian	6.09%	22
White/Caucasian	45.98%	166
Native American/Alaskan Native	0.28%	1
Total Respondents: 361		

Q41 Please provide any additional comments or feedback.

Answered: 40 Skipped: 405

Student Recruitment, Development and Welfare Committee
Summary Report 2015-2016

Julia Fan, Biological & Agricultural Engineering
Marc Facciotti, Biomedical Engineering
Jason White, Chemical Engineering & Materials Science
Dawn Cheng, Civil & Environmental Engineering
Norman Matloff, Computer Science
Erkin Seeker, Electrical & Computer Engineering, CHAIR
Jean VanderGheynst, Ex Officio, Assoc. Dean Graduate Education
Jim Schaaf, Ex Officio, Assoc. Dean Undergraduate Studies

The SRDW Committee met twice and conducted the following business:

May 2016

- A meeting will be held to select the June 2016 student commencement speaker.

April 2016

- A meeting was held to select the MS Ghausi College medalist after review of applications: Trevor Halsted, Mechanical Engineering.

REPORT OF THE AWARDS COMMITTEE

FY 2015/16

The committee met in early November to review committee workload for the academic year. Gloria Hayes, the campus coordinator for National and International Faculty Awards, met with committee members to discuss the various award opportunities for engineering faculty. She provided a list of approximately 150 awards. Committee members were asked to share this information with their respective department chairs and to encourage nominations.

The committee met again in mid-February to review the nine nominations submitted from various departments for the Zuhair A. Munir Best Dissertation Award. The committee chose Jennifer "Jeni" K. Lee (BME) as the awardee, and selected David Grilli (CEE) and Ahmed Elsherif (ECE) for honorable mention.

The committee will meet again May 20 to discuss nominees and recommend recipients for the four COE Faculty Awards.

May 12, 2016

To: The Faculty of the College of Engineering

FR: Ben Shaw
Chair, Undergraduate Educational Policy Committee (UGEPC)

RE: Annual report of the Undergraduate Educational Policy Committee, Spring 2016

The Undergraduate Committee on Educational Policy met 7 times during the 2015-2016 academic year, and will meet two more times before the end of the quarter (5/17/16 and 6/7/16). The following actions were taken by this committee:

Degree Lists:

Received the degrees list for Summer 2015, Fall 2015, and Winter 2016.

Sample Transfer Grid:

The transfer grid for community college transfer students was given to departments to revise to conform to course changes (approved at the 4/19/16 meeting).

Change of Major Requirements for MAE Majors (Mechanical, Aerospace):

No request has yet come to the Committee to continue exception to policy for AY2016-17.

Change of Major Requirements for Biomedical Majors

Will request approval to continue exception to policy for one year for Biomedical majors to require a 2.8 GPA at May meeting.

Dismissal Report

A dismissal report (for AY 2014-15) will be reviewed by the Committee at the June meeting.

New Courses, Changes and Cancellations:

Reviewed and approved 74 new, changed, and cancelled courses.

New courses: ECS 174, ECS 98F, ECS 198F, ECS 199FA, ECS 199FB, ECI 140, ECI 147A, ECI 147B

Curriculum Changes:

Curriculum changes for the 2016-2017 academic year were approved for the following programs:

Biochemical Engineering
Biomedical Engineering
Civil Engineering
Computer Science Engineering

Changes for the 2016-2017 academic year were approved for the following minors:

Energy Science & Technology

Regulation Review:

Regulation 40 was considered by the Committee. The following wording was approved and sent on to the CEC, to be considered by that Committee and then the faculty as a whole (AY2016-17):

Students enrolled in any undergraduate major within the College of Engineering may not exercise Passed/Not Passed grading for any coursework offered by the College of Engineering nor for satisfaction of course requirements towards their degree with the exception of GE requirements as follows: GE courses or unrestricted electives taken outside the College of Engineering, up to 16 units, may be taken for P/NP grading. Courses offered only on a P/NP basis (e.g., Engineering 199's), are acceptable for specific program area degree requirements.

The Committee reviewed student petitions as follows:

Reviewed and approved 16 automatic exceptions to major requirements or policy

Reviewed 16 student change of major petitions. 13 were approved, 3 were denied

Reviewed 12 student petitions for exception to major requirements or policy. 10 were approved (one of which was subsequently denied by the Office of the University Registrar) and 2 were denied.

Respectfully submitted,

T. Jeoh/ S. Vougioukas (BAE)
T. Passerini (BME)
N. El-Farra (CHMS)
C. Bronner/J. Darby (CEE)
P. Rogaway (CS)
S. Ghiasi (ECE)

B. Shaw, Chair (MAE)

Committee Composition:

1 Representative from each Dept, Executive Assistant Dean for College of Engineering, Director of IT Services

Committee Meetings:

Monthly throughout the year

Major Accomplishments

1. Publication of annual strategic plan
2. Initiated Kemper rewire project
3. Completed pilot of virtual desktop computer lab for instruction. Upgraded 1 computer lab (72 workstations) in the CoE.
4. Initiated process to review CoE cloud. Decision to renew the cloud or choose commercial option will be made in 2016-17.
5. Finalized testing of first CoE shared HPC system and opened hpc1.engineering.ucdavis.edu for general CoE faculty use.
6. Took on IT support for ORUs (ITS and CGM)
7. Continued expansion of program where Tier 1 staff members reported directly to IT Director with dotted line to Dept MSO. 6 Depts / ORUs now participating in this program (BAE, BME, CEE, MAE, ITS, CGM). Units not reporting are CS, ECE, CHMS, CWS.

8. New security program initiated with monthly reports to IT committee, more scanning/logging, emphasis on rapid incident response.
9. Passed policy recommending removal of all private routers from the CoE network. Work is moving forward slowly to respect faculty needs.
10. Helped shape campus Big Fix Program to resemble our own CoE program giving faculty choice and therefore building trust
11. Implemented trial security program (SECEON) to enhance threat detection across our networks
12. Provided privacy guidance for faculty, staff, and students during transition to Windows10.

Research & Library Committee
Report to the Faculty
Academic Year 2015-2016

Committee Members: Stavros Vougioukas, Vivek Srinivasan, Pieter Stroeve, Boris Jeremić, Yong Jae Lee, M. Saif Islam (Chair), Fidelis Eke, Jean VanderGheynst (*ex officio*).

The Research & Library Committee met seven times during the academic year. This document represents a summary of the work of the committee for 2015-2016.

Metrics for Responsible use of Research Space. Received and answered a charge letter from Dean Curtis asking for "advice and counsel" on proposed "metrics for quantifying responsible use of research facilities." The committee's recommendations and other documents related to this request can be found in Appendix A.

College of Engineering Research Center Reviews. Received and answered a charge letter from Dean Curtis requesting the committee to prepare a short report that proposes "criteria for the evaluation of [research] centers in the College of Engineering" and to further "recommend a frequency for center review." The committee's recommendations and other documents related to this request can be found in Appendix B.

Review of Limited Submission Proposals. The committee is charged with providing recommendations to the Office of Research of faculty proposals in cases where limited College or University submission is necessary. In 2015-16, the Committee has completed seven such reviews and there are three reviews in progress. A list of limited submission reviews can be found in Appendix C.

Appendix A. Metrics for Responsible Use of Research Space

February 12, 2016

TO: Jennifer S. Curtis
Dean, College of Engineering

FR: M. Saif Islam
Professor of Electrical Engineering
Chair, Research & Library Committee

RE: Recommendation for research space allocation metrics

On November 9, 2015 you issued a charge to the Research and Library Committee of the College of Engineering to investigate potential metrics for quantifying the responsible use of research facilities.

I have attached the committee's report and welcome and any questions or comments you may have regarding the work of the committee.

Sincerely yours,

M. Saif Islam

Proposal for Metrics to Quantify Responsible use of Research Space
Submitted to Dean Curtis on February 12, 2016 by the Research and Library Committee

On November 9th, 2015, the Research and Library Committee of the College of Engineering received the charge to prepare "a short report proposing metrics for quantifying responsible use of research facilities" within the College of Engineering. The charge letter is contained in Appendix A. Members of the committee included Stavros Vougioukas (BAE), Vivek Srinivasan (BME), M Saif Islam (ECE), Sabyasachi Sen (CHMS), Pieter Stroeve (CHMS), Yong Jae Lee (CS), Fidelis Eke (MAE), Boris Jeremic (CEE), and Jean VanderGheynst (ex-officio). Interim Assistant Dean Dave Shelby and committee administrative support staff Kim Reinking also contributed to discussions and collection of data.

The Research & Library Committee held three meetings devoted to this issue. Information was collected about metrics used by other UC Davis schools and colleges, at other research institutions, and in each department in the College of Engineering. This report summarizes those findings and concludes with the recommendations of this committee.

Research space metrics used by other campus units
With the exception of the College of Biological Sciences, each of the UC Davis schools and colleges and the Division of Mathematics and Physical Science relies on the California Postsecondary Education Commission (CPEC) guidelines (Appendix B) for assigning research space to departments. Information regarding how individual departments within each college assign research space was not requested by other colleges.

The **College of Biological Sciences** has a general guideline of 200 to 250 assignable square feet (asf) of space (office, lab, common equipment) per paid investigator. The range of asf is intended to recognize the fact that some space is much more efficient than other space. Paid investigators are faculty, post-docs, federation staff, and graduate students. One undergrad per lab counts, regardless of whether there is one undergrad or ten undergrads, as they share space.

College of Engineering research space metrics
In the College of Engineering (CoE), four departments have documented policies regarding the assignment of space, one has an informal policy and two do not have any guidelines for the assignment of research space. Below is the status of space metrics and policy for each CoE department.

Biomedical Engineering: There is a specific policy for space allocation and review that does not specify how square footage is assigned. Each faculty member holding a 100% appointment receives an initial space allocation, guaranteed for five years. Review of assignment of square footage is considered using established thresholds. Thresholds are based on the assumption that research expenditures correlate with space needs. When expenditures fall above or below set thresholds, space can be gained or lost. There is a focus on collegiality and finding synergies for space use.

Biological and Agricultural Engineering: Within the recent past, the department has not had an established and comprehensive space assignment policy. CPEC standards are the nearest to a set

of metrics for space allocation but are not formally used. CPEC metrics were used as general guidelines in Bainer renovations.

CPEC guidelines were intended for use at the campus and deans levels, not at the department level, and that for application to BAE, CPEC categories 5 and F were being used for teaching and research laboratories. Category 5 specifies 90 asf/station and category F specifies 500 asf per faculty FTE plus 250 asf per graduate student and postdoc. Office space runs in at 195 asf per headcount for faculty, teaching assistants, and postdocs.

Civil & Environmental Engineering: Much of the asf in Civil and Environmental Engineering is assigned to one of the five research areas in the department and is considered shared space within each of those areas of emphasis. There is both written and unwritten policy.

Computer Science: The department has an informal policy: all graduate students should have somewhere to sit.

Electrical and Computer Engineering: The department has no formal space policy.

Chemical Engineering and Materials Science: Each faculty member holding a 100% appointment receives an initial space allocation, guaranteed for five years for assistant professors and three years for associate professors and above. Review of assignment of square footage is based on established thresholds of research expenditures based on the assumption that research expenditures correlate with space needs. When expenditures fall above or below set thresholds, space can be gained or lost although space is not monitored closely.

Mechanical and Aerospace Engineering: The department follows a space policy written in 2005 that is based on CPEC categories. There is a baseline asf allocation for each senate faculty PI based on the type of research activity (using CPEC guidelines). Additional allocations are based on the number of supported postdoctoral, graduate, and undergraduate students; research support staff; visitors hired through extramural funding; and "self-supported" graduate students and visiting scholars in the facility. A three-year rolling average is used to filter out short-term fluctuations in support and there is a three-year grace period for untenured recruits. Initial space allocations for untenured faculty are based on their expected research activity.

Research space metrics used at other institutions

We briefly reviewed practices at other institutions with space metrics posted to their websites. The metrics from their websites are summarized in Table 1.

The metrics were categorized into three general areas based on (1) funding and expenditures, (2) scholarship, and (3) student success and engagement. For the four institutions reviewed, common metrics included external funding, research expenditures, and number of graduate and undergraduate students using the space for research under faculty supervision.

Table 1. Published metrics used by other research and teaching institutions and programs

Metric	Rochester Institute of Technology	Brown University Program in Biology	University of Texas, San Antonio	University of Michigan
Funding Metrics				
External Funding	X	X	X (New within the past year)	X
Active Pursuit of Extramural Funding		X		
Startup Funding				
Indirect cost recovery (indirect cost recovery/sq. ft.)	X	X (primary)		X
Total research expenditures	X	X	X (5 year average)	X
Monetary Gifts	X			
Gifts in Kind (equipment)	X			
Previous funding history		X		
Scholarship Metrics				
Peer reviewed publications	X		X (5 year average)	
Quality/impact of research (data required)		X		X
Patents and copyrights	X			
Books, Magazine articles, Exhibits, External presentations	X			
Student Success Metrics				
Credit hours generated by research/thesis work using the space	X			
Number of theses and dissertations per year based on use of research space	X		X (5 year average)	
Number of grad/undergrad students using space for research under faculty supervision	X	X	X (5 year average)	X
Other				
Previous amount of space assigned			X (5 year average)	
Alignment of research activity with the strategic priorities of the Division		X		X
Type of Research (theoretical vs. laboratory		X		

Method for choice of metric

A worksheet was developed to gather input regarding possible metrics to propose to Dean Curtis. The worksheet included metrics based on those listed in Table 1. Each committee member was asked to (1) rate each metric on whether it was acceptable, possibly acceptable and not acceptable, (2) suggest additional metrics, and (3) provide comments on these metrics. Members were encouraged to consult with their department chairs. Individual department ratings and comments can be found in Appendix C. Ratings were averaged and presented for discussion at the February 3rd meeting of the committee. Average ratings are provided in Appendix D. Members in attendance at the February 3rd meeting were: Stavros Vougioukas (BAE), Vivek

Srinivasan (BME), M Saif Islam (ECE), Pieter Stroeve (CHMS), Yong Jae Lee (CS), Case Van Dam (MAE) and Boris Jeremic (CEE). Associate Dean Jean VanderGheynst, Interim Assistant Dean Dave Shelby and committee administrative support staff Kim Reinking were in attendance.

Recommendations of the committee

The Research & Library Committee of the College of Engineering recommends the use of the metrics listed in Table 2 to guide decisions regarding evaluation of efficient use of research space and to provide a realistic evaluation of the need for additional research space. Proposed metrics would capture the following: (1) scholarly work by graduate students, postdoctoral scholars, and professional researchers and engineers under faculty supervision, (2) research expenditures, (3) external funding, (4) the type of space, and (5) undergraduate research. In order to effectively use the metrics in Table 2, faculty assignments to space in the campus Facilities Link would need to be updated on a regular basis.

It is the recommendation of this committee that these metrics be tested prior to implementation to ensure they yield reasonable results. Once implemented it is expected they will be used with the recognition that some research activities have unique space demands that standard metrics cannot address. Furthermore, the committee expects the pursuit of productive research will not be hindered by the strict application of these metrics.

Table 2. Proposed metrics, data sources, averaging and weighting. For relative importance: 1= most important and 5=least important.

Metric	Data Source and Averaging	Relative Weight	Relative Importance
Number of graduate students, postdoctoral scholars and professional researchers and development engineers using space under faculty supervision (#/sqft)	Graduate student numbers determined by enrollment in research units (299) with faculty member. Post-doctoral scholars and research scientists determined by title code in PPS and source of faculty funding. Values would be averaged over a four-year period.	MS= .05/student PhD D1= 0.5/student PhD D2 = 1.0/student Post-doctoral and professional researchers = total FTE*	1
Research expenditures including gifts ($/sqft)	US News & World Report expenditure data. Values would be averaged over a four-year period.		2
External funding ($/sqft)	Office of Research awards data. Values would be averaged over a four-year period.		3
Type of Research: theoretical vs. wet lab vs. lab with large equipment (categorical)	Assign category to space based on CPEC standards. Use of space would be evaluated against other spaces in the same category.		4
Undergraduates engaged in research (SCH/sqft)	Student Credit Hours (SCH) generated by undergraduate research (099, 199) units. Values would be averaged over a four-year period.	099 units = 0.5/SCH 199 units = 1/SCH	5

*Some individuals with federation appointments run significant research programs and those individuals might be weighted higher than a post-doc if the first metric is considered alone

Appendix A: Dean's Charge to Research and Library Committee, November 9, 2015

UNIVERSITY OF CALIFORNIA, DAVIS

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November 9, 2015

RESEARCH AND LIBRARY COMMITTEE MEMBERS
College of Engineering

RE: Research Space Metrics Charge to Research and Library Committee

Dear Colleagues,

Department chairs have shared with me the challenges associated with the limitations of space currently available to the college, both in terms of total amount and functionality. The current situation will only be exacerbated by projections of up to seventy-five faculty recruitments over the next five to six years. The potential for success in this endeavor will be highly dependent upon the availability of suitable research space thus it is important that we demonstrate responsible use of existing space.

I would like to examine current practice and would very much appreciate the benefit of your advice and counsel in the form of a short report proposing metrics for quantifying responsible use of research facilities.

Because these needs are not unique to our college (nor to the campus), there are a number of resources to assist this effort. These include models developed by other schools and colleges, particularly College of Biological Sciences and College of Agricultural and Environmental Sciences. Likewise, metrics historically used by the central campus and UCOP may be useful, as well as the Facilities Link online space database maintained by the Office of Institutional Analysis. In addition, some departments within the college have developed methodologies to monitor and guide their internal allocations of space, and these efforts can likely help inform college-wide metrics for evaluating use of research space.

A final report would be very much appreciated no later than January 31, 2016.

I appreciate in advance your willingness to accept this assignment, welcome any questions, and look forward to your report.

Sincerely,

Jennifer Sinclair Curtis

Jennifer Sinclair Curtis
Dean, College of Engineering
University of California, Davis

California Postsecondary Education Commission (CPEC) Space Planning Guidelines

The following CPEC space standards are formulas used to determine space allowances for research space and office facilities.

Space standards provide a measure of how much space can be expected to be used in I&R programs. *Activities such as organized research are not included in these standards.*

Space standards take into account the type of people for whom the space is provided, the type of activity being conducted, and an average amount of space required per person to carry out that activity as well as space to house ancillary personnel, equipment and supplies. *Some spaces are considered non-standard, such as assembly, animal quarters and greenhouses, and therefore are not included in these standards.*

Research and Office Space

	Researc			Office
	ASF	AS	ASF per	ASF er aculty
ategory	Facul	Grad	ostdoc	TA Postdoc
A	50	50	50	195
B	150	100	100	195
C	150	150	150	195
D	350	175	175	195
E	500	250	250	195
F	500	250	250	195

A: Economics, Education Studies, Ethnic Studies, History, Literature, Mathematics, Philosophy, Political Science, Sociology

B: Linguistics

C: Anthropology, Communication, Urban Studies & Planning

D: Cognitive Science, CSE, ECE, Psychology

E: Music, Theatre & Dance, Visual Arts

F: Bioengineering, Biology, Chemistry & Biochemistry, MAE, Nanoengineering, Physics, Structural Engineering

California Postsecondary Education Commission (CPEC) Space Planning Guidelines

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Research and Office Space

	Researc			Office
	ASF	AS	ASF per	ASF er aculty
ategо	Facul	Grad	ostdoc	TA Postdoc
A	50	50	50	195
B	150	100	100	195
C	150	150	150	195
D	350	175	175	195
E	500	250	250	195
F	500	250	250	195

A: Economics, Education Studies, Ethnic Studies, History, Literature, Mathematics, Philosophy, Political Science, Sociology

B: Linguistics

C: Anthropology, Communication, Urban Studies & Planning

D: Cognitive Science, CSE, ECE, Psychology

E: Music, Theatre & Dance, Visual Arts

F: Bioengineering, Biology, Chemistry & Biochemistry, MAE, Nanoengineering, Physics, Structural Engineering

Appendix C. Department Metric Ratings Work Sheets

Research Space Metrics
Feedback from the
Department of Biological & Agricultural Engineering

Rating (3=acceptable, 2= might be acceptable, 1= not acceptable)

Metric	Rating	Comments
External Funding ($/sq ft)	3	It is acceptable, but it should be merged with all types of funding. - Average of 3 to 5 years
Active Pursuit of Extramural Funding ($/sq ft)	2.75	It is acceptable, but it should be merged with all types of funding.
Startup Funding ($/sq ft)	2	It is acceptable, but it should be merged with all types of funding. Wouldn't this category be irrelevant for many spaces? - For new faculty, would this be something that could be used in place of Extramural Funding in the first few years? - Many older faculty members never got any startup funding. Not sure how this will work.
Indirect cost recovery ($/sq ft)	1.75	Especially important for shop. - Would this penalize funding from sources that do not pay IDC or have lower rates than federal grants? - Lot of our work is with State and Commodity boards which do not allow or restrict indirect cost
Total research expenditures ($/sq ft)	2.5	
Monetary Gifts ($/sq ft)	2.25	It is acceptable, but it should be merged with all types of funding.
Gifts in Kind (equipment) ($/sq ft)	2.25	
Previous funding history ($/sq ft)	2.5	Specify the boundaries (what does previous mean? When does the measurment start?)Specific to the PI? Or the space? If it's specific to the PI, then there's an inconsistency between assessing the value of the space versus the productivity of the PI. If it is of the space, then this metric could be arbitrary depending on the history of the space. - It seems like the appropriateness of this parameter would depend on how many years the other values are averaged over: e.g. if the other metrics are only taken over, say, 2 years, this may make more sense to include a longer past history. However, if the other metrics are averaged over 5 years, then maybe it may not be necessary, seeing as though the current status of the program would be what should most impact space usage (?).
Peer reviewed publications (#/sq ft)	3.	
Quality/impact of research (impact factor/sq ft)	2.25	Is this a journal impact factor? Which would be weighted higher? # of pubs/sq ft (previous category) or impact factor of pubs/sq ft? - Would there be any type of "correction" here based on the average impact factor for different fields? For example, even if you publish in the "best"/"highest" journals in some fields they may have a lower IF compared to other fields.
Patents and copyrights (#/sq ft)	2.5	What about CE type published material?
Books, Magazine articles, Exhibits, External presentations (#/sq ft)	2.25	
Credit hours generated by research/thesis work using the space (SCH/sq ft)	2.5	I don't really understand how this is computed. Is this different from #20? - Would this include graduate and undergraduate? (e.g. 199 and 299)
Number of theses and dissertations per year based on use of research space	3	May be an average over normative time

Appendix C. Department Metric Ratings Work Sheets

(#/sq ft)		
Number of grad/undergrad students, postdocs and visiting researchers using space for research under faculty supervision (#/sq ft)	3	How would this be calculated? What if you are collaborating with other PIs and have students generally working in certain lab space, although they may not be directly under the faculty supervision
Previous amount of space assigned (sq ft)	1.33	I assume this was assigned per previous approval and evaluation, so it seems redundant. This one I interpret as being specific to the PI. So my previous comment about inconsistency between assessing PI productivity and space use stands. - How would this be factored in? It isn't clear what this means, for example, is this to be used if someone had more space and it was taken away? How should that impact the current space assignment?
Alignment of research activity with the strategic priorities of the college (based on rating scale developed by the faculty)*	2	Too Subjective and tough to measure, there should be a whole college agreement in how to assign this
Type of research (scaling factor to be developed by the faculty)*	1.75	Too Subjective and tough to measure, there should be a whole college agreement in how to assign this. For example field work
Additional Metrics:		
Field work	3	What about field work (CE specialist). Is it considered lab space. If it is not, at least it should be a factor to assign lab space to the investigator for off season storage, etc.
Recharge Dollars Generated		which would help some space like our shop but irrelevant for other space.
General Comments	- Over how many years will these values be calculated? How will grant funds be applied to this calculation - e.g. if you received 500K for 5 years, will this only count in the year it was received, or will it count as 100K/year for 5 years in the average? (How much these things influence the calculation will depend on over how many years the values are averaged on)	
	How will shared space be accounted for? For example, if there is an area of shared space within a laboratory, with which PI will that space be counted for? What if several PIs share the same space? If there is a lot of shared space usage, is it more appropriate to have a metric/space instead of /PI? However, this may give an advantage/disadvantage to certain PIs, e.g. a PI with low productivity equally sharing a space with a PI with high productivity	
	Will the space quality be included here? Seeing as though there is a large difference in the quality of space, it may be good to include a rating factor for quality as well.	
	- For many of these metrics, it seems like it would be quite hard to have a high level in all of them, but they may be assessed as having a minimum from each group. For example, in funding, it may be necessary to have a certain amount of total funding from all sources, or to have at least 1 acceptable in the list of extramural, gifts, etc. Similarly in publications, it may be more appropriate to have a higher weight on peer-reviewed publications, but for those individuals that have many patents or other types of publications, to be able to have lower scores in 1 area but higher in other related areas without being penalized.	
	- How will the levels of acceptable vs. unacceptable be determined? How will this be standardized to make sure that differences in different fields do not negatively/positively impact certain individuals? Is it enough to have a generalized "ranking/scale" factor?	
	I think that it is unethical that faculty would be penalized for performing research sponsored by non-profit groups (like commodity boards), state agencies, USDA and other agencies who do not pay the full overhead rate. Much of this research directly supports the mission of the CAES, and the Ag. Experiment Station and has value to Californians. A metric based upon indirect cost rate paid is basically saying that UC faculty should only perform research in support of for profit organizations and should not perform research to the benefit of humankind unless someone can make a profit on that research.	

Appendix C. Department Metric Ratings Work Sheets

	BAE faculty have joint appointments between colleges and as such have a responsibility to fulfill their job expectations/duties outside of the CoE that are not adequately addressed in this document. Perhaps a multiplier needs to be implemented related to the proportion of a faculty member's appointment in CoE vs. CAES and the Ag. Experiment Station. Impact should be based upon how people's lives are changed, not based upon an ivory tower metric such as a journal impact factor. For example, hundreds of peach farmers no longer fight with inspectors and processors each day in the summer over subjective assessments methods because we helped them implement objective, quantitative assessment methods in the inspection of each load of peach fruit delivered by the farmer. I have had many people say that they were grateful for the work we did in modernizing the inspection process. This work had a direct impact on people's daily lives, but would never show up as an impact related to a journal's impact factor.

* These 2 categories seem to be quite subjective - how could scores be assigned here in an objective and equitable fashion to all faculty, seeing as though many faculty have several active lines of research and research types have a large variation throughout the college.

Appendix C. Department Metric Ratings Work Sheets

Research Space Metrics
Feedback from the
Department of Biomedical Engineering

Rating (3=acceptable, 2= might be acceptable, 1= not acceptable)

Metric	Rating	Comments
External Funding ($/sq ft)	3	
Active Pursuit of Extramural Funding ($/sq ft)	2	
Startup Funding ($/sq ft)	2	
Indirect cost recovery ($/sq ft)	2	
Total research expenditures ($/sq ft)	3	The $$$ amounts also need to include funding generated by the entire lab (Incl student and postdoc fellowships), not just the PI.
Monetary Gifts ($/sq ft)	1	
Gifts in Kind (equipment) ($/sq ft)	1	
Previous funding history ($/sq ft)	2	
Peer reviewed publications (#/sq ft)	1	
Quality/impact of research (impact factor/sq ft)	1	
Patents and copyrights (#/sq ft)	1	
Books, Magazine articles, Exhibits, External presentations (#/sq ft)	1	
Credit hours generated by research/thesis work using the space (SCH/sq ft)	2	
Number of theses and dissertations per year based on use of research space (#/sq ft)	2	
Number of grad/undergrad students, postdocs and visiting researchers using space for research under faculty supervision (#/sq ft)	3	1. My strong feeling is that this needs to include academic federation members too and research staff (so total number of people employed in the lab). 2. undergrad and MS should be weighted differently from PhD and postdocs
Previous amount of space assigned (sq ft)	1	
Alignment of research activity with the strategic priorities of the college (based on rating scale developed by the faculty)	1	Some of these seem particularly strange--notably, "type of research" and "alignment with college priorities". Who determines this? This seems open to the interpretation of a few and could severely impact academic freedom.
Type of research (scaling factor to be developed by the faculty)	1	I believe BME may have given "type of research" a low rating due to the fact that this metric was rather vague in the spreadsheet. I suspect that this may have received a higher ranking from our department if the metric was more fleshed out as it is in the final report.
Comments		So I guess I am favoring something that weights number of people in lab, total research expenditures of that lab (all personnel in lab) and publication record as the primary driving factors. But there still need to be deviations, as space needs can vary based on type of equipment etc…and so the limitations of any single number derived always should be considered.

Appendix C. Department Metric Ratings Work Sheets

Research Space Metrics
Feedback from the
Department of Civil and Environmental Engineering

Rating (3=acceptable, 2= might be acceptable, 1= not acceptable)

Metric	Rating	Comments
External Funding ($/sq ft)	3	However, research expenditures is a better metric
Active Pursuit of Extramural Funding ($/sq ft)	1	Difficult to quantify non-tangible efforts; this will only count submitted proposals
Startup Funding ($/sq ft)	1	May impact hiring decisions
Indirect cost recovery ($/sq ft)	2	
Total research expenditures ($/sq ft)	3	Again, research expenditures should be adequate
Monetary Gifts ($/sq ft)	1	
Gifts in Kind (equipment) ($/sq ft)	1	Not a metric that faculty can control/influence
Previous funding history ($/sq ft)	1	Research expenditures averaged over 3 - 5 years will provide this information
Peer reviewed publications (#/sq ft)	1	Publication rates vary significantly by dept and discipline
Quality/impact of research (impact factor/sq ft)	1	Metrics such as impact factor are coming under scrutiny since they can be doctored
Patents and copyrights (#/sq ft)	1	
Books, Magazine articles, Exhibits, External presentations (#/sq ft)	1	
Credit hours generated by research/thesis work using the space (SCH/sq ft)	1	
Number of theses and dissertations per year based on use of research space (#/sq ft)	2	
Number of grad/undergrad students, postdocs and visiting researchers using space for research under faculty supervision (#/sq ft)	3	
Previous amount of space assigned (sq ft)	1	
Alignment of research activity with the strategic priorities of the college (based on rating scale developed by the faculty)	1	A strange metric - since college strategic plan is typically a synthesis of individual department plans. Will the college be setting up research priorities for the departments?
Type of research (scaling factor to be developed by the faculty)	3	
Comments:	Any metric that is adopted should be averaged over 2 (or 3) and 5 (or 7) years to get a short-term and longer-term perspective	
	Departments should also provide a short narrative when summarizing space utilization - since some special facilities may be shared-use labs (across campus and also across the US as in the case of some NSF funded centers)	

Appendix C. Department Metric Ratings Work Sheets

Research Space Metrics
Feedback from the Department of
Chemical Engineering and Materials Science

Rating (3=acceptable, 2= might be acceptable, 1= not acceptable)

Metric	Rating	Comments
External Funding ($/sq ft)	3	
Active Pursuit of Extramural Funding ($/sq ft)	2	
Startup Funding ($/sq ft)	3	
Indirect cost recovery ($/sq ft)	1	
Total research expenditures ($/sq ft)	3	
Monetary Gifts ($/sq ft)	3	
Gifts in Kind (equipment) ($/sq ft)	2	
Previous funding history ($/sq ft)	1	
Peer reviewed publications (#/sq ft)	3	Most important!
Quality/impact of research (impact factor/sq ft)	3	Impact factor of journals is important.
Patents and copyrights (#/sq ft)	1	
Books, Magazine articles, Exhibits, External presentations (#/sq ft)	1	
Credit hours generated by research/thesis work using the space (SCH/sq ft)	1	
Number of theses and dissertations per year based on use of research space (#/sq ft)	3	But only if theses lead to many publications in high impact journals.
Number of grad/undergrad students, postdocs and visiting researchers using space for research under faculty supervision (#/sq ft)	3	Grad students are most important. Visiting researchers should not count in the formula.
Previous amount of space assigned (sq ft)	1	"Legacy assignment" has to be taken with a grain of salt.
Alignment of research activity with the strategic priorities of the college (based on rating scale developed by the faculty)	1	interferes with academic freedom!
Type of research (scaling factor to be developed by the faculty)	3	Theoretical research does not require lab space.
Comments:	Other: Most important is that faculty that do research have some space. Currently ChE&MS does not have enough.	

Appendix C. Department Metric Ratings Work Sheets

Research Space Metrics
Feedback from the
Department of Computer Science

Rating (3=acceptable, 2= might be acceptable, 1= not acceptable)

Metric	Rating	Comments
External Funding ($/sq ft)	1.5	"If your external funding is cut or drops temporarily, you should not lose your space"
Active Pursuit of Extramural Funding ($/sq ft)	1.5	
Startup Funding ($/sq ft)	1.5	
Indirect cost recovery ($/sq ft)	1	
Total research expenditures ($/sq ft)	1	"widely different between experimental vs other labs"
Monetary Gifts ($/sq ft)	1	
Gifts in Kind (equipment) ($/sq ft)	1.5	"you need a place to put the equipment"
Previous funding history ($/sq ft)	15	"assuming it's over a long enough term"
Peer reviewed publications (#/sq ft)	1.5	
Quality/impact of research (impact factor/sq ft)	1	"There is no accepted measure of "Quality" of research. Impact factor is known to be a poor indicator of quality of research"; "the publication "input factor" usually doesn't reflect quality or non-traditional impacts"
Patents and copyrights (#/sq ft)	1	"Some areas of research (e.g. theory) are not suitable for patents. Copyright is a non-issue: all IP produced here is copyrighted "The Regents of UC""; "some don't apply for patents because they don't want to, or don't trust the patent evaluation at the USPTO"
Books, Magazine articles, Exhibits, External presentations (#/sq ft)	1	"poor measure of quality, varies by research area"
Credit hours generated by research/thesis work using the space (SCH/sq ft)	1	"Impossible to measure. Number subject to interpretation."
Number of theses and dissertations per year based on use of research space (#/sq ft)	1	"Number of dissertations per year vary widely between research areas, and is not indicative of quality."; "Space is not a function of students" graduated; it's a function of students *writing* theses and dissertations"
Number of grad/undergrad students, postdocs and visiting researchers using space for research under faculty supervision (#/sq ft)	3	"This is possibly the only meaningful measure."; "Again, need space for people; but space should be based on needs of Ugs, GSRs, postdocs, not a fixed number"
Previous amount of space assigned (sq ft)	1.5	"Need to find where to put equipment and students if you lose space"
Alignment of research activity with the strategic priorities of the college (based on rating scale developed by the faculty)	1	"If the research passes muster in quality & quantity, I think it's an infringement of faculty rights for other priorities to be taken into account."; "The College has no available definition of strategic priorities. This is also an interference with academic freedom."; "Sometimes supposedly useless research has a large impact externally; faculty may not be the best judge of this"
Type of research (scaling factor to be developed by the faculty)	3	

Appendix C. Department Metric Ratings Work Sheets

Comments	"only #20 (number of researchers) and #23 (type of research) makes sense."; "only #20 and #23 are acceptable; all other options are unacceptable."; "the fundamental question should be "What space is needed to conduct the research?". Housing graduate students is one aspect of this. Particular types of research may generate very different space needs, for example, someone might need lab facilities or room to test a VR setup. I don't see how you drive this with a formula."; "I very strongly agree that using a formula to drive space allocation is crazy."; "... All space is considered "equal" in these simplistic considerations. This is not reflecting the large difference in cost between e.g. a chemistry lab and an office. Trying to reduce everything to a single number (here sq ft) is absurd."; "The factors cannot be evaluated objectively in a way that (a) will seem equitable to everyone, and (b) will take into account all possible contingencies and circumstances that may drive the need for space. It's inherently a judgement call at some point. Sure, formulae can provide guidance, but there is a huge difference between "providing guidance" and "being dispositive". And my fear is that, even if initially the formulae provide guidance, it will quickly become dispositive." Equipment should be taken into account when allocating space; Students/researchers should all have seats; MS students who are doing thesis should have space; Money is not a good criterion (e.g., some equipments can cost a lot; students can be self-funded)

Appendix C. Department Metric Ratings Work Sheets

Research Space Metrics
Feedback from the
Department of Electrical and Computer Engineering

Rating (3=acceptable, 2= might be acceptable, 1= not acceptable)

Metric	Rating	Comments
External Funding ($/sq ft)	2.67	Note that this is extremely important. Not fair to those who can't get agency funding
Active Pursuit of Extramural Funding ($/sq ft)	2.5	Very important, but with the caveat that just pursuing support without a previous history/ track record greatly diminishes the value Maybe, but issues about amount needed for good performance
Startup Funding ($/sq ft)	1.67	With the assumption that the funding is pegged to realistic needs yes
Indirect cost recovery ($/sq ft)	1.83	
Total research expenditures ($/sq ft)	2.5	
Monetary Gifts ($/sq ft)	2.5	
Gifts in Kind (equipment) ($/sq ft)	2.17	
Previous funding history ($/sq ft)	2.17	Over what period? A track record is extremely important. Given the ever changing priorities of funding agencies a faculty member may lose all or a significant fraction of his/her funding and needs time to secure new funding. Given funding cycles this is likely to take well over a year and so I feel that 3 years is a reasonable timescale assuming that extramural funding is being actively pursued. Track record okay
Peer reviewed publications (#/sq ft)	2.17	Does not necessarily correlate with impact factor
Quality/impact of research (impact factor/sq ft)	2.17	Blindly using the impact factor is a potential problem Yes
Patents and copyrights (#/sq ft)	2	Yes if used over entire career
Books, Magazine articles, Exhibits, External presentations (#/sq ft)	1.83	
Credit hours generated by research/thesis work using the space (SCH/sq ft)	2.5	Absolutely
Number of theses and dissertations per year based on use of research space (#/sq ft)	2.33	Yes
Number of grad/undergrad students, postdocs and visiting researchers using space for research under faculty supervision (#/sq ft)	3	Probably the most important metric
Previous amount of space assigned	1.8	Too vague

Appendix C. Department Metric Ratings Work Sheets

(sq ft)		Maybe
Alignment of research activity with the strategic priorities of the college (based on rating scale developed by the faculty)	1	Too vague No way- faculty with great track record continue as is
Type of research (scaling factor to be developed by the faculty)	1.17	If this is concerned with experimental versus theoretical research. Too vague No way- faculty with great track record continue as is
Additional Metrics:		External Fellowships
Comments	Other: The type of research space must be well matched to the type of research since the actual needs vary dramatically as does the cost/value of the space. Some criteria/requirements include: vibration isolation, high bay, roll-up doors, overhead hoist, AC power, exhaust ventilation, fume hood, water, etc. I have seen a number of instances of very poorly thought out assignment decisions . One example is the assignment of the Cruz Hall Cannery Pilot Plant Facility (Power, High Bay, Multiple Roll-Up Doors, etc.) for dance thereby resulting in my lab being moved off campus to Chiles Road with catastrophic consequences (to compound the problem we are being moved once again !) H factor/track record/external awards/career impact	

Appendix C. Department Metric Ratings Work Sheets

Research Space Metrics
Feedback from the
Department of Mechanical and Aerospace Engineering

Rating (3=acceptable, 2= might be acceptable, 1= not acceptable)

Metric	Rating	Comments
External Funding ($/sq ft)	1	External funding could involve significant amount of flow-through with zero impact on space needs.
Active Pursuit of Extramural Funding ($/sq ft)	1	
Startup Funding ($/sq ft)	1	Startups should be dealt with separately
Indirect cost recovery ($/sq ft)	1	
Total research expenditures ($/sq ft)	3	Also incorporates 3, 4, 6, 8
Monetary Gifts ($/sq ft)	1	
Gifts in Kind (equipment) ($/sq ft)	1	Equipment could see little use and take up a lot of space
Previous funding history ($/sq ft)	1	
Peer reviewed publications (#/sq ft)	2	Theoretical research could result in large number of publications but require little space
Quality/impact of research (impact factor/sq ft)	1	
Patents and copyrights (#/sq ft)	2	
Books, Magazine articles, Exhibits, External presentations (#/sq ft)	1	
Credit hours generated by research/thesis work using the space (SCH/sq ft)	3	Undergraduate and graduate students 199, 299 credit hours
Number of theses and dissertations per year based on use of research space (#/sq ft)	2	18 should be closely linked to this
Number of grad/undergrad students, postdocs and visiting researchers using space for research under faculty supervision (#/sq ft)	3	Don't doublecount grad/undergrad students. 13 takes care of students. But number of postdocs, staff (supported by PI), visiting researchers should be accounted for.
Previous amount of space assigned (sq ft)	3	Through 3-5 year moving average process
Alignment of research activity with the strategic priorities of the college (based on rating scale developed by the faculty)	1	
Type of research (scaling factor to be developed by the faculty)	3	Appropriate scaling factors should be applied. Some research is more space intensive than other research activities.

Appendix D: Average of Departmental Space Metric Rankings

Research Space Metrics
Summary and Average of Departmental Ratings

METRIC	BAE	BME	CHMS	CEE	CS	ECE	MAE	Average	St Dev
External Funding ($/sq ft)	3	3	3	3	1.5	2.7	1	2.5	0.8
Active Pursuit of Extramural Funding ($/sq ft)	3	2	2	1	1.5	2.5	1	1.9	0.7
Startup Funding ($/sq ft)	2	2	3	1	1.5	1.6	1	1.7	0.7
Indirect cost recovery ($/sq ft)	2	2	1	2	1	1.8	1	1.5	0.5
Total research expenditures ($/sq ft)	3	3	3	3	1	2.5	3	2.6	0.7
Monetary Gifts ($/sq ft)	2	1	3	1	1	2.5	1	1.6	0.9
Gifts in Kind (equipment) ($/sq ft)	2	1	2	1	1.5	2.2	1	1.5	0.5
Previous funding history ($/sq ft)	3	2	1	1	1.5	2.2	1	1.7	0.8
Peer reviewed publications (#/sq ft)	3	1	3	1	1.5	2.2	2	2.0	0.8
Quality/impact of research (impact factor/sq ft)	2	1	3	1	1	2.2	1	1.6	0.8
Patents and copyrights (#/sq ft)	3	1	1	1	1	2	2	1.6	0.8
Books, Magazine articles, Exhibits, External presentations (#/sq ft)	2	1	1	1	1	1.8	1	1.3	0.4
Credit hours generated by research/thesis work using the space (SCH/sq ft)	3	2	1	2	1	2.5	3	2.1	0.8
Number of theses and dissertations per year based on use of research space (#/sq ft)	3	2	3	2	1	2.3	2	2.2	0.7
Number of grad/undergrad students, postdocs and visiting researchers using space for research under faculty supervision (#/sq ft)	3	3	3	3	3	3	3	3.0	0.0
Previous amount of space assigned (sq ft)	1.3	1	1	1	1.5	1.8	3	1.5	0.7
Alignment of research activity with the strategic priorities of the college (based on rating scale developed by the faculty)	2	1	1	1	1	1	1	1.1	0.4
Type of research (scaling factor to be developed by the faculty)	1.8	1	3	3	3	1.2	3	2.3	0.9

Appendix B. College of Engineering Research Center Reviews

May 13, 2016

TO: Jennifer S. Curtis
Dean, College of Engineering

FR: M. Saif Islam
Professor of Electrical Engineering
Chair, Research & Library Committee

RE: Recommendation for Research Center Review Criteria

On March 30, 2016 you issued a charge to the Research and Library Committee of the College of Engineering to investigate factors to be considered for the review of research centers within the College of Engineering.

I have attached the committee's report and welcome and any questions or comments you may have regarding the work of the committee.

Research and Library Committee: Recommended Criteria for the Evaluation of Research Centers in the College of Engineering

On March 30, 2016, The Research & Library Committee of the College of Engineering received a letter from Dean Jennifer Curtis requesting the committee to prepare a short report that proposes "criteria for the evaluation of [research] centers in the College of Engineering" and to further "recommend a frequency for center review." The charge letter is contained in Appendix A. Members of the committee included Stavros Vougioukas (BAE), Vivek Srinivasan (BME), M Saif Islam (ECE), Pieter Stroeve (CHMS), Yong Jae Lee (CS), Fidelis Eke (MAE), Boris Jeremić (CEE), and Associate Dean for Research and Graduate Studies Jean VanderGheynst (ex-officio). Kim Reinking, administrative staff support for the Research and Library Committee, also contributed to discussions and collection of data. The Research & Library Committee held two meetings devoted to this issue.

Method for Choice of Criteria and Recommended Review Period

Information was collected from the Office of Research about the process and metrics for the review of Organized Research Units at UC Davis. These materials are found in Appendix B and C.

A worksheet was developed to collect input regarding potential criteria for research center reviews and to recommend an appropriate review frequency. Table 1 lists the elements of this worksheet. Each committee member was asked to (1) rate each criterion on whether it was very important, not important; (2) suggest additional criteria, and (3) provide comments on ratings as needed. Individual department ratings and comments can be found in Appendix D. Ratings were averaged and presented for discussion at the May 10th meeting of the committee.

After discussion consensus was reached on the criteria for determining research centers that will undergo review, the frequency with which these reviews should be conducted and elements of the review process. Recommended criteria and comments are provided in Appendix E.

Members in attendance at the May 10th meeting were: Stavros Vougioukas (BAE), Vivek Srinivasan (BME), M. Saif Islam (ECE), Yong Jae Lee (CS), Fidelis Eke (MAE) and Boris Jeremić (CEE), and Associate Dean Jean VanderGheynst. Committee administrative support staff Kim Reinking was also in attendance.

Recommendations of the Committee

The Research and Library Committee recommends the following for determining research centers will be reviewed:

- Any center that receives $20K or more in funding per year from the College of Engineering
- Any center that uses College of Engineering space (above and beyond faculty lab and office space)

- Any center that requests funding from the College of Engineering (bridge funds, etc.)

With respect to the frequency of such review, the committee recommends

- Centers subject to review should submit an annual one-page report
- Centers subject to review should undergo full review every five years
- Requests for new and/or additional funds from the College of Engineering will require a review as a condition of this request.

The committee recommends the full review examine four core areas of impact:

- Research
- Education
- Impact on Campus
- Public service

The full list of recommended research center review criteria are listed below in Table 2.

Table 2. Research & Library Committee Recommended Research Center Review Criteria

Criteria for selection of centers to be reviewed	
	Centers receiving $20K or more per year in financial support from CoE
	Centers receiving space from CoE (space in addition to faculty office and faculty lab space)
Frequency of review	
	Annual reporting, five year review
	When support is requested from CoE
Criteria for review	
Research	Accomplishment of objectives as stated in the research mission of the center. Impact of research accomplished on the campus and community.
	Benefit to research programs or departments of instruction and research, including faculty and student personnel engaged in research within the center.
	Assessment should be relative to the center's mission (educational and training vs. research. technology transfer). Publications issued by the center, including reports and reprints in its own covers as well as material published in refereed journals both by faculty and by students.
	Doctoral dissertations and masters theses by UCD graduate students involved in center.

Education	Graduate and postdoctoral student participation through assistantships, fellowships, or traineeships or otherwise are involved in the center's work, including paid employment and graduate student research.
	Unique student training opportunities that enhance their opportunities in the job market and/or facilitates their research and professional development (e.g., TAs, GSRs, informal teaching and/or technological expertise)
	Unique colloquia, equipment, facilities, and/or professional networks offered by the center
Impact on Campus	Evidence that the existence of the center was a factor in attracting faculty or students to the campus (leverage for faculty startup packages). A large number of grants would not have been funded without the facility.
	Assessment of the uses of all resources available to the center and evaluation of the center's internal and external sources of support in relation to its mission.
	Advantages and disadvantages to the campus that might reasonably be expected to occur in the future if the center is continued.
	Possible effect on the campus from disestablishment of the center. Could use some of research criteria to make this case.
Public Service	Contributions in the form of lectures, tours, visiting groups, conferences, etc., within the community, state, and nation, as well as services to the campus community.

UNIVERSITY OF CALIFORNIA, DAVIS

Appendix A: Charge Letter

BERKELEY • DAVIS • IRVINE • LOS ANGELES • MERCED • RIVERSIDE • SAN DIEGO • SAN FRANCISCO

SANTA BARBARA • SANTA CRUZ

JENNIFER SINCLAIR CURTIS, DEAN
PHONE: (530) 752-0554
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COLLEGE OF ENGINEERING
OFFICE OF THE DEAN
ONE SHIELDS AVENUE
DAVIS, CA 95616-5294

March 30, 2016

RESEARCH AND LIBRARY COMMITTEE MEMBERS
College of Engineering

RE: Evaluation of Centers in the College of Engineering

Dear Colleagues,

Research centers within the College of Engineering provide vital infrastructure for organized research, outreach and student training. They also require resources from departments and the dean's office for administration and space. While there are guidelines for center and organized research unit reviews at the campus level, we do not have guidelines for such reviews in the college.

I am writing to ask that you propose criteria for the evaluation of centers in the College of Engineering. Please also recommend a frequency for center reviews. I would appreciate receiving this information in the form of a short report by May 16, 2016.

Sincerely,

Jennifer Sinclair Curtis

Jennifer Sinclair Curtis
Dean, College of Engineering

UCDAVIS
OFFICE OF RESEARCH

ORU Review Process

1. Timeline for ORU Reviews

   Timeline for ORU reviews is set by the Office of Research (OR) in agreement with the Academic Senate, based on the official establishment date of the ORU. ORU reviews occur in intervals of five years or less, and usually occur at the same time but also in 5-year intervals when the ORU Director is reviewed. These two reviews lead to two separate and confidential reports written by an appointed *ad hoc* review committee.

   An ORU has a maximum life span of 15 years from date of establishment, after which the campus must submit to the President a formal proposal for continued ORU status in the context of the University's needs and resources at the time of review. A 15-year review is also referred to as an ORU's "Sunset Review." In no case may an ORU be continued beyond these 15-year periods without approval of the President.

2. ORU Director's ORU Report

   ORU Director is notified by letter and email from OR Vice Chancellor - Research (VCR) of upcoming review and given a deadline for submitting a 5-year, 10-year or 15-year ORU Director's Report. This report is a compilation of data primarily gathered for the ORU's prior annual reports (from the actual annual reports, the director's annual summaries, and the yearly statistical summaries of the unit over a given period of years) that addresses the following areas:

   a. Number of graduate and postdoctoral students directly contributing to the ORU.
   b. Number of faculty members actively engaged in the ORU's activities.
   c. Extent of student and faculty participation from other campuses.
   d. ORU's number of FTE of employees in professional, technical, administrative and clerical classifications.
   e. List of publications, including reports and reprints issued in ORU.
   f. ORU's support funds, including income from all types of services.
   g. ORU's expenditures for administrative support and direct research.
   h. Description of ORU's space, detailing total space currently occupied.
   i. ORU's 5-year projections of plans and requirements, plus any other information.

3. Director's ORU Report Received—Review Officially Begins

   Once the ORU Director's report has been received, the official review process begins. By this step OR should have the *ad hoc* review committee appointed or in process. Additionally, pertinent background information regarding the ORU, requested documentation for ORU name change (if applicable), etc., is compiled into a review binder and sent to each appointed committee member.

ORU Review Process

4. *Ad hoc* Review Committee Is Appointed

Once the committee has been appointed, its members are provided with the following information prior to their first meeting:

- ORU Director's review report.
- Background information on the *ad hoc* review committee members (including CV's).
- UC policies that outline the review process and components to be addressed in the committee reports and OR's summary of the review process. Policies for this review include:
  - UCD Policy and Procedure Manual (PPM) Section 220-01, *Organized Research*
  - UCD PPM 220.01, Exhibit A, *Proposal for Establishment of an ORU*
  - UCD PPM 220.01, Exhibit B, *Annual Reports of an ORU*
  - UCD PPM 220.01, Exhibit C, *Guidelines for the Review of an ORU*
  - UCOP Administrative Policies and Procedures Concerning ORUs
  - UCOP December 7, 1999 Letter, *Administrative Policies and Procedures Concerning ORUs*
  - UCD Academic Personnel Manual (APM) 420, Appendix II-C, *Appointment and Review of ORU Directors*
  - Appointment and Promotion APM – 242, Directors of Organized Research Units, Rev. 12/14/00, 242-24 Authority
  - UC PPM Section 200-50, *Name Changes for Campus Units* (if applicable) Instruction for Name Change giving overview of process
    - Note: Only if the ORU is requesting a name change, will the policies and procedures for name changes be included in the committee's information
  - Comments of the ORU Advisory Committee (if any)
  - Annual reports of the unit during the time period of review
  - Budgetary and expenditure information along with any additional statistical supplementary information
  - Other information as appropriate and/or requested

5. Components of the ORU Review Report

It is the responsibility of the members of the *ad hoc* review committee to ascertain the extent to which the unit/ORU being reviewed has succeeded in achieving its goals and the general goals of the University with regard to its original purpose, present functioning, future plans, and continuing development to meet the needs of the field.

Implied in the review committee's responsibility is recognition and encouragement of ORU achievement and/or recommendation for change or disestablishment.

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ORU Review Process

Recap of Required Information for ORU Program and Director Review

1. Address the ORU's original purpose, present functioning, research accomplishments (such as publications, grants, and new collaborations resulting from research conducted or sponsored by the unit), future plans, and continuing development to meet the needs of the field.
2. Assess the adequacy of space and other resources made available to the unit.
3. Review unit's success in meeting previously established objectives, planned changes in program objectives, and planned steps to achieve new objectives.
4. Review explicit budget information, including amounts and sources of all funds and expenditures, and assess whether the budget is adequate and appropriate to support the unit's mission.
5. Make specific recommendations, if appropriate, for improvements in the mission, budget, administration, research focus, space and other resource requirements, and programs and activities of the unit.
6. Consider whether the unit should merge with another similar unit or be disestablished.
7. If requested review reasons for Director's request for unit name change, and provide recommendations.
8. Review effectiveness of Director and provide recommendation for continuing Director's appointment.

On prior page 2 of 3 UC Davis Policy 220-01, Exhibit C, details guidelines for the review of ORUs including scope and criteria for review of the program, and UCOP's policy details guidelines, too.

The review of the Director MUST be confidential. The chairperson of the review committee should remind members of the committee, and others whom it is essential for the committee to consult, of the confidential nature of the assignment.

Additional information requests should go through the Office of Research who will then forward the information to the committee.

6. *Ad hoc* Review Committee's Final Report Received by OR

After taking Director/Dean(s) comments into account, the VCR may request consideration of revisions to be made by the review committee.

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Program in International & Community Nutrition

5-Year Organized Research Unit Review

Purpose and Responsibility of the Review Committees

The quality of organized research units (ORUs) of the University of California is assessed at five-year intervals through objective and thorough appraisal of the program and directorship of the unit. Responsibility for this appraisal falls largely upon the members of the ad hoc review committees nominated by the Davis Division of the Academic Senate and appointed by the Vice Chancellor--Research, who serves as the designated representative of the Chancellor. It is the duty of these committees to ascertain the extent to which each unit has succeeded in achieving its goals and the general goals of the University with regard to its original purpose, present functioning, future plans, and continuing development to meet the needs of the field. Implied in the committee's responsibility is recognition and encouragement of achievement and/or recommendation for change or disestablishment.

Scope and Criteria for Review of the Program

A. Scope of Reviews. The ad hoc review committee shall judge the unit according to the criteria set forth in paragraph 1 of these guidelines with respect to its purpose, program, and success, considering its record of performance in (a) research, (b) teaching, (c) impact on the campus, and (d) public service. In evaluating the unit's effectiveness in these areas, the review committee shall exercise reasonable flexibility, recognizing that each unit presents problems and issues unique to the unit under review.

B. Criteria of Reviews. The criteria set forth below are intended to serve as a guide in judging the unit, not to set boundaries to the elements of performance that may be considered.

Research

1. Quality of research accomplished and in progress.
2. Accomplishment of objectives as stated in the research mission of the ORU, evaluation of changes in direction of research and their impact, impact of research accomplished on the campus and community.
3. Benefit to research programs or departments of instruction and research, including faculty and student personnel engaged in research within the ORU.
4. Quality of professional staff as evidenced by such things as awards, honors, presentations at national and international scholarly conferences.
5. Comparison with other similar units at other campuses and/or institutions.
6. Publications issued by the ORU, including reports and reprints in its own covers as well as material published in refereed journals--both by faculty and by students. Publications in progress and in the developmental stages should be included, as well as doctoral dissertations by graduate students.
7. Interdisciplinary nature of the unit's research efforts, if appropriate.

Teaching

1. Administrative support to graduate education, pre- and postdoctoral.
2. Degree to which graduate and postdoctoral students participate through assistantships, fellowships, or traineeships or otherwise are involved in ORU work, including paid employment and graduate student research.
3. Sponsorship of internships with or without credit for graduate and undergraduate research.

4. Direct or indirect contributions of ORU to graduate and undergraduate teaching programs of academic departments.

5. Staffing of unit, including number of full-time academic staff with fractional appointments in academic departments, faculty with part-time appointments in the ORU, and degree to which each category participates in teaching programs of academic departments. This would include participation in regular courses and seminars of academic departments, supervision of independent research and group study, etc.

6. Student and faculty participation from other campuses in regard to all of the above points.

7. What types of students are attached to the unit? What projects do they work on? What published work and/or success at grantsmanship results from their scientific activities?

8. Do students gain unique training that enhance their opportunities in the job market and/or facilitates their research and professional development [e.g., TAs, RAs, informal teaching and/or technological expertise]?

9. Does the unit provide unique access to colloquia, equipment, facilities, and/or professional networks for both faculty and students?

10. What are the direct or indirect contributions of the unit to graduate and undergraduate teaching programs?

11. What are the current professional status of the unit's graduate over the past five years; location and title?

12. What role did the unit play in post-graduate placement and what aspect, if any, of the unit training program was important in placement?

Impact on Campus

1. Evidence that existence of the ORU was a factor in attracting faculty or students to the campus.

2. Effect of the program of the unit on campus programs, including statements as to why the goals and objectives could not be accomplished within the existing departmental structure.

3. Assessment of the uses of all resources available to the unit and evaluation of the unit's internal and external sources of support in relation to its mission.

4. Advantages and disadvantages to the campus that might reasonably be expected to occur in the future if the unit is continued.

5. Possible effect on the campus from disestablishment of the unit.

Public Service

1. Contributions in the form of lectures, tours, visiting groups, conferences, etc., within the community, state, and nation, as well as services to the campus community.

2. Interaction with other similar units or research in other places. Other services to the community, state, and nation, such as distribution of research information, recognition by non-University groups or governmental agencies.

3. Other evidence of the direct, tangible impact of the activities of the ORU on the public at large.

Committee Comments on Research

Comments

Committee Comments on Teaching

Comments

Committee Comments on the Impact on Campus

Comments

Committee Comments on Public Service

Comments

Justification for Continuance

1. Does the unit provide a coherent and well-defined plan for its continued operations for the next five years?

2. Are there adequate plans in place for external fundraising and grant writing to enable these plans?

3. To what extent do the Indirect Cost Returns support the unit's operation?

Committee Comments

Comments

Problems and Needs

Are there any constraints which prevent the unit from functioning at an optimal level?

Committee Comments

Comments

Overall Recommendations

Taking into account the responses to the above, as well as any other questions, concerns and issues that arise in the Senate Review, should the campus consider approving continuation of the unit?

Committee Comments

Comments

Report respectfully submitted by:

Margret Bentley, Chair _____ Date _____

Reynaldo Martorell _____ Date _____

Marc Schenker _____ Date _____

Keith West _____ Date _____

Appendix D: Individual Department Rating of Review Metric

Potential Metrics for CoE Research Center Review
College of Engineering Research Library Committee

Please rate the criteria below based on importance in review of centers

Rating scale: 3= Very Important; 2= Important, 1= Not Important

Criteria for selection of centers to be reviewed	Rating	Comments	BAE	BIM	CIVIL	CHMS	CS	ECE	MAE	
									2	
Centers receiving financial support from CoE (suggest threshold amount in comments)	2.8571429	$200K/year; //can receive up to 1 year for one staff person, to bridge between funding, and this only once// / $25,000 TROTAL for the first year.//I'm not sure about the threshold amount, but I feel this is an important criterion.//5-10k// Center may receive support from the OR or univ administration.	3	3	3	3	3	3	2	2.8571429
Centers receiving space from CoE (space in addition to faculty office and faculty lab space)	2.3333333	While active, center can have space, if bridging between grants, up to one year only... Need to demonstrate active/pending proposal//; Not important. A center can use theparticipating faculty's lab space.//Again, this seems important.// Unless the space is specifically allocated from the Dean above and beyond the space that the department handles.	3	1	3	1	3	3		2.3333333
Frequency of review	**Rating**	**Comments**								
Every five years for centers with continuous support (suggest frequency in comments if different from 5 years)	2.8571429	Review yearly, scientific, administration, etc. Every 3 years a major review, and also major review a year before original funding is to expire!	3	3	3	3	2	3	3	2.8571429
When support is requested from CoE (loss of funding and or break in funding)	2	only allow for bridge funding between external funding!//At most $5,000 forone year, but no more after that. Centers should be self supporting.//Disruption in funding and review at the same time (or as prerequisite for funding) could increase the risk for recovery.// 1 or 2 years can be offered to the center admin after loss of funding	1	3	3	1	2	2	2	2
Criteria for review	**Rating**	**Comments**								
Research										
Accomplishment of objectives as stated in the research mission of the center and impact of research accomplished on the campus and community.	3	somewhat hard to measure//Among Research criteria, this is the most important, along with publications.//	3		3	3	3	3	3	3
Benefit to research programs or departments of instruction and research, including faculty and student personnel engaged in research within the center.	2.5714286	again, hard to measure//Assess and quantify?//	3	2	3	3	2	3	2	2.5714286
Quality of professional staff as evidenced by such things as awards, honors, presentations at national and international scholarly conferences.	2.2857143	award and honors are mostly subjective, do not warant high quality of science and engineering. Presentations at conference do not warant much either!//Reports rate only a (1). Most important (3) are journal papers.//Citations of publications originating from the center?//	3	2	1	3	2	3	2	2.2857143
Publications issued by the center, including reports and reprints in its own covers as well as material published in refereed journals both by faculty and by students.	2.5	need to do a yearly publication of all developed work (reports, papers, etc.)//Some centers may not be able to publish too much specially if DOD is involved.//	3	1	2	3	3	2.5	3	2.5
Publications in progress and in the developmental stages both by faculty and by students.	1.7142857	Just note what they are, and then follow next year....//Difficult to quantify in a verifiable manner, unless submitted. ..//	2	1	1	2	2	2	2	1.7142857
Doctoral dissertations and masters theses by UCD graduate students involved in center.	2.5	all those are reports of sort, need to be fully available. .	3		2	3	2	3	2	2.5
Interdisciplinary nature of the unit's research efforts	1.5714286	science is important, interdisciplinary tag is not important	1	2	1	3	1	2	1	1.5714286
Benefit to research programs of new faculty	1.7857143	I would leave new faculty out of this, if they want they can participate, but do not force them to participate.	2	2	1	3	1	2.5	1	1.7857143
Education										
Graduate and postdoctoral student participation through assistantships, fellowships, or traineeships or otherwise are involved in the center's work, including paid employment and graduate student research	2.7142857	this shows center activity//Yes, students and postdoctoral researchers should be key members of the center.//	3	2	2	3	3	3	3	2.7142857
Sponsorship of internships with or without credit for graduate student research	1.8571429	?//Having this as a criterion may be an unnecessary burden to the center?//As with Lab space criteria, credit-only internships can be tracked and verified.//	3	1	1	2	1	2	3	1.8571429
Sponsorship of internships with or without credit for undergraduate research	1.7142857	?//Again, I'm not sure how feasible and useful this would be.//As with Lab space criteria, credit-only internships can be tracked and verified.//	3	1	1	2	1	2	2	1.7142857
Direct or indirect contributions of the center to graduate and undergraduate teaching programs of academic departments	2.3571429	need to get technology transfer from state of the art research at centers into teaching//Assess and quantify?//1	2	3	2	3	1	2.5	3	2.3571429
Staffing of unit, including number of full-time academic staff with fractional appointments in academic departments, faculty with part-time appointments in the center, and degree to which each category participates in the teaching programs of academic departments. This would include participation in regular courses and seminars of academic departments.	2	Center is a scientific endeavor, not an academic unit, faculty are appointed to academic units, not centers!	2	2	3	1	2	3	1	2
Student and faculty participation from other campuses in regard to all of the above points	1.5	This is not important, in the sense that such participation can become politicized....	2	1	1	2	1	1.5	2	1.5
Unique student training opportunities that enhance their opportunities in the job market and/or facilitates their research and professional development (e.g., TAs, GSRs, informal teaching and/or technological expertise)	2.6428571	How unique are centers, and what do they offer to students and researchers in terms of innovation, uniqueness..//Overlap with line-25 criterion?//	3	3	3	2	2	2.5	3	2.6428571
Unique colloquia, equipment, facilities, and/or professional networks offered by the center	2.6428571	important, but not to the extent that university spends funds to maintain equipment that is not used, and has little scientific value....	3	2	3	3	2	2.5	3	2.6428571

Potential Metrics for CoE Research Center Review
College of Engineering Research Library Committee

Role of the center in post-graduate placement	1.9285714	center does science, if science is good, and participants are good, placement will come...//Placement outside UC Davis only//Assess and quantify?//	3	1	1	3	1	2.5	2	1.9285714
Participation of underserved students in the center	1.8333333	Center is a scientific endeavor...	2		1	3	1	2	2	1.8333333
Impact on Campus										
Evidence that the existence of the center was a factor in attracting faculty or students to the campus.	2.1428571	this is subjective and it is hard to check//Assess and quantify?//	2	3	1	3	2	2	2	2.1428571
Assessment of the uses of all resources available to the center and evaluation of the center's internal and external sources of support in relation to its mission.	2.5714286	Very important, clear accounting, with plans for at least three years should be analyzed and evaluated	3	2	3	3	2	3	2	2.5714286
Advantages and disadvantages to the campus that might reasonably be expected to occur in the future if the center is continued.	2.5714286	very important, should be based on rational analysis...	3	2	3	2	2	3	3	2.5714286
Possible effect on the campus from disestablishment of the center.	2.3571429	if inactive, should be (carefully) disestablished. .//if disestablishment will be a big negative, then yes, this is very important.//	3	3	2	1	3	2.5	2	2.3571429
Public Service										
Contributions in the form of lectures, tours, visiting groups, conferences, etc., within the community, state, and nation, as well as services to the campus community.	2.0714286	again, center is a scientific unit, so if there are lectures, visitors, etc, it is OK, but this is not a primary mission!// Service and enhanced public perception are very important.//	3	3	1	2	1	2.5	2	2.0714286
Interaction with other similar centers in other places. Other services to the community, state, and nation, such as distribution of research information, recognition by non-University groups or governmental agencies.	1.7142857	if science is good, service to community and nation is good. Recognitions are subjective (sometimes)...	1	2	1	3	1	2	2	1.7142857

Other

Jerry Woodall's comments:
I think the most important metric of a center is its global impact on either science or engineering. All of the rest of the above issues are subservient to this metric. I am tired of watching the agencies fund make-do research that will accomplish nothing a the end of the day except keep students feed and provide faculty with summer salary. I have watched worthy ERCs, MRSEC and DOE HUB proposals made by me and others get rejected by incompetive agency staff. This must stop; and the only way it will is for top UCD administrators, from the Dean of CoE and up to start intenesely lobbying the agencies, like Henry Yang did when he was Dear of Eng at Purdue. Nearly all awarded proposals have a hidden political agenda, and UCD needs to play this game like ASU does.

BIM comment. Not all centers listed arerResearch centers

Appendix E: Recommended Metrics for CoE Research Center Review
College of Engineering Research Library Committee

Rating scale: 3= Very Important; 2= Important, 1= Not Important

Criteria for selection of centers to be reviewed	Rating	Comments
Centers receiving $20K or more per year in financial support from CoE	2.9	Need more information about what is provided now. CMGI, CNM2, CGM, AQRC, How much they bring in and how much they spend.
Centers receiving space from CoE (space in addition to faculty office and faculty lab space)	2.3	
Frequency of review	**Rating**	**Comments**
Annual reporting and five year review	2.9	Annual report would be one page
When support is requested from CoE	2.0	
Criteria for review	**Rating**	**Comments**
Research		
Accomplishment of objectives as stated in the research mission of the center. Impact of research accomplished on the campus and community.	3.0	
Benefit to research programs or departments of instruction and research, including faculty and student personnel engaged in research within the center.	2.6	
Assessment should be relative to the center's mission (education and training vs. research vs. technology transfer). Publications issued by the center, including reports and reprints in its own covers as well as material published in refereed journals both by faculty and by students.	2.5	Assessment should be relative to the center's mission (educationa and training vs. research vs. technology transfer).
Doctoral dissertations and masters theses by UCD graduate students involved in center.	2.5	Should be listed and fully available

Appendix E: Recommended Metrics for CoE Research Center Review

College of Engineering Research Library Committee

Education		
Graduate and postdoctoral student participation through assistantships, fellowships, or traineeships or otherwise are involved in the center's work, including paid employment and graduate student research.	2.7	List of student employees and students who receive funding from the center.
Unique student training opportunities that enhance their opportunities in the job market and/or facilitates their research and professional development (e.g., TAs, GSRs, informal teaching and/or technological expertise)	2.6	How unique are centers, and what do they offer to students and researchers in terms of innovation, uniqueness..//Overlap with line-25 criterion?//
Unique colloquia, equipment, facilities, and/or professional networks offered by the center	2.6	important, but not to the extent that university spends funds to maintain equipment that is not used, and has little scientific value...
Impact on Campus		
Evidence that the existence of the center was a factor in attracting faculty or students to the campus. (leverage for faculty startup packages. A large number of grants would not have been funded without the facility.	2.1	Leverage for faculty startup packages, grants that would not have been funded without the faciity.
Assessment of the uses of all resources available to the center and evaluation of the center's internal and external sources of support in relation to its mission.	2.6	
Advantages and disadvantages to the campus that might reasonably be expected to occur in the future if the center is continued.	2.6	
Possible effect on the campus from disestablishment of the center.	2.4	Could use some of research criteria to make this case
Public Service		
Contributions in the form of lectures, tours, visiting groups, conferences, etc., within the community, state, and nation, as well as services to the campus community.	2.1	

Appendix C: Review of Limited Submission Proposals

LIST OF REVIEWERS FOR AY 2015-16, as of 5/12/16. Note AY is IN PROGRESS.
Source: Research Funding Database, 60546 Reviewers by Program Type.sql

Sponsor	Title	Internal Deadline	Review Deadline	Sponsor Deadline	Reviewer	Department Name	School/ College
National Science Foundation (NSF)	National Science Foundation Research Traineeship (NRT) Program	10/20/15	11/4/15	2/22/16	Wu, Shyhtsun	ENGR COMPUTER SCIENCE	COE
Rita Allen Foundation	Rita Allen Foundation Scholars Program	10/27/15	11/12/15	1/22/16	Srinivasan, Vivek	BIOMEDICAL ENGINEERING	COE
W.M. Keck Foundation	Science & Engineering and Medical Research Programs	10/27/15	11/12/15	5/1/16	Eke, Fidelis	MECHANICAL & AEROSPACE ENGR	COE
Brain Research Foundation	Fay/Frank Seed Grant Program	11/17/15	12/2/15	1/7/16	Islam, M Saiful	ELECT & COMP ENGR	COE
Brain Research Foundation	Fay/Frank Seed Grant Program	11/17/15	12/2/15	1/7/16	Vandergheynst, Jean	BIOLOGICAL & AG ENGINEERING	COE
National Science Foundation (NSF)	Scholarships in Science, Technology, Engineering, and Mathematics (S-STEM)	1/19/16	2/3/16	5/16/16	Vandergheynst, Jean	BIOLOGICAL & AG ENGINEERING	COE
National Science Foundation (NSF)	Materials Research Science and Engineering Center (MRSEC)	4/19/16	5/4/16	7/1/16	Vandergheynst, Jean	BIOLOGICAL & AG ENGINEERING	COE
Brain Research Foundation	Scientific Innovations in Neuroscience	5/3/16	5/18/16	9/29/16	Revzin, Alexander	BIOMEDICAL ENGINEERING	COE
Brain Research Foundation	Scientific Innovations in Neuroscience	5/3/16	5/18/16	9/29/16	Seker, Erkin	ELECT & COMP ENGR	COE
W.M. Keck Foundation	Science & Engineering and Medical Research Programs	5/17/16	6/1/16	11/1/16	Srinivasan, Vivek	BIOMEDICAL ENGINEERING	COE
Pew Charitable Trust	Pew Scholars Program in the Biomedical Sciences	5/24/16	6/8/16	11/1/16	Vougioukas, Stavros	BIOLOGICAL & AG ENGINEERING	COE
The Hartwell Foundation	Hartwell Individual Biomedical Research Award	6/7/16	6/22/16	9/15/16	none confirmed		COE

College of Engineering
2016-17 Estimated Budget, All Funds
(Dollars in thousands)

Should reflect the baseline of your operations, DO NOT include requests for additional campus resources.
Columns C&D are formulas that will populate from other tabs, DO NOT change formulas.

line		*2015-16 Projected Year-End Results*	*2016-17 Estimate*						
		Total	**State Funds & Tuition**	**ICR**	**Student Fees**	**All Other Funds**	**Total**	**%**	**Pie Chart**
1	**PRIOR YEAR CARRYFORWARD (July 1 Balance):**	$40,047	$12,724	$10,394	$503	$18,702	$42,323		
	SOURCES OF ANNUAL OPERATING FUNDS *(net of depreciation, improvements reserves, and distributions out of org)*								
2	State Funds and Tuition	$55,983	$57,281				$57,281		
3	Indirect Cost Return	$10,731		$7,721			$7,721		
4	Professional Degree Supplemental Tuition	$0					$0		
5	Self-Supporting Degree Program Fees	$0					$0		
6	Student Service Fees and Campus Based Fees	$0					$0		
7	Other Student Fees [List if desired, not required]	$787			$787		$787		
8	Other Income or Recharge [List if Desired, Not Required]	$2,872				$4,022	$4,022		
9	Other Fund Types [List if Desired, Not Required]	$8,062				$8,304	$8,304		
10	**ANNUAL OPERATING SOURCES [Lines 3+4+5+6+7+8+9+10]**	**$78,435**	**$57,281**	**$7,721**	**$787**	**$12,326**	**$78,115**		
	USES OF ANNUAL OPERATING FUNDS							**%**	**Pie Chart**
11	**EMPLOYEE COMPENSATION:**								
12	Regular Faculty (ACAD, SB01, SUB0)	$23,885	$23,462	$34	$233	$84	$23,813	31.4%	$ 24,783,475 Faculty Salaries
13	Academic Administrators (SB05)	$424	$862	$0	$0	$0	$862		
14	Other Academics (SB06, SB03, ACAX, ACGA)	$112	$69	$0	$22	$18	$109		
15	Teaching & Research Assistants, House Staff (SB02, SB07, SB04)	$3,189	$3,102	$0	$74	$0	$3,176	4.0%	$ 3,175,866 Teaching Assistants
16	Staff Salaries (STFO, SUBS, SUBG, SUBX, STFB)	$15,755	$10,085	$2,739	$154	$3,350	$16,327	20.7%	$ 16,327,167 Staff Salaries
17	Employee Benefits (SUB6, SB28, SB67)	$16,009	$15,063	$323	$43	$1,249	$16,678	21.1%	$ 16,678,143 Faculty and Staff Benefits
18	**Total Employee Compensation [Lines 13+14+15+16+17+18]**	**$59,374**	**$52,643**	**$3,096**	**$525**	**$4,701**	**$60,965**		
19	**OPERATING EXPENSES AND EQUIPMENT**							2.1%	$ 1,626,000 OP Tax
20	Supplies & Expense (SUB3)	$9,322	$2,689	$3,037	$139	$3,381	$9,245	20.6%	$ 16,287,845 Supplies
21	Subcontracts (SB73)	$0	$0	$0	$0	$0	$0		
22	Equipment & Facilities (SB34, SUB4)	$1,387	$160	$887	$0	$925	$1,972		
23	**Total Operating Expenses and Equipment [Lines 21+22+23]**	**$10,709**	**$2,848**	**$3,924**	**$139**	**$4,306**	**$11,217**		
24	**TRAVEL (SUB5)**	**$1,333**	**$76**	**$498**	**$19**	**$761**	**$1,354**		
25	**FINANCIAL AID (SCHL)**	**$554**	**$314**	**$10**	**$26**	**$99**	**$448**		
26	**OTHER UNALLOCATED (SUB8, SUB7, SBMC)**	**$3,214**	**$1,668**	**$1,680**	**$0**	**$625**	**$3,973**		
27	**DISTRIBUTIONS TO OTHER UNITS & DEBT SERVICE**	**$974**	**$540**	**$382**	**$0**	**$0**	**$921**		
28	**TOTAL USES [Lines 19+24+25+26+27+28]**	**$76,159**	**$58,089**	**$9,588**	**$708**	**$10,493**	**$78,878**	100.0%	$ 78,878,496
									$ -
29	**ANNUAL SOURCES LESS USES [Line 11 - Line 29]**	**$2,276**	**-$808**	**-$1,867**	**$79**	**$1,833**	**-$763**		
30	**One-time Investments from Carryforward (Detail on separate Tab)**	**$1,446**	**$2,012**	**$3,920**	**$0**	**$250**	**$6,182**		
31	**ANNUAL NET OPERATING POSTION [Line 30+Line 31] [Surplus (+)/Deficit (-)]**	**$3,722**	**$1,204**	**$2,053**	**$79**	**$2,083**	**$5,419**		
32	**ESTIMATED YEAR END CARRYFORWARD [Line 2 + Line 30]**	**$42,323**	**$11,916**	**$8,527**	**$582**	**$20,535**	**$41,560**		
		Total	**Federal**	**State**	**Private**	**Local/Other**	**Total**		
33	**Estimated Contract and Grant Direct Expenditures**	**$57,817**	**$39,054**	**$11,147**	**$7,425**	**$1,347**	**$58,973**		

Explanatory Notes: COE has flow through base budget for graduate support to department totaling $1.447M (this is included as a source and also as a use in row 28 in SUB8). COE has included funding and expenses for CNM2 in ICR. Funding and expenses = $3.2M