Chairs' & Center Directors' Meeting Minutes

Date: December 7, 2015
Location: WCH – Room 443
Attendees: Reza Abbaschian
Nael Abu-Ghazaleh (for Walid Najjar)
Guillermo Aguilar
Bir Bhanu
Mitch Boretz
Marek Chrobak
Jay Farrell
Javier Garay
Robert Haddon
Pat Hartney
Nosang Myung
Ravi
Kambiz Vafai
Akula Venkatram
Sharon Walker

Absent: Alex Balandin
Matt Barth
Walid Najjar
Albert Wang

1. Welcome and call for agenda items – Reza
Reza noted last Friday's BCOE Staff Appreciation and Javier Garay recognition event. Also, he passed around a copy of BCOE's 25th Anniversary book that was recently published. Javier received the first copy of this book. All BCOE faculty and staff will receive copies. Reza asked that Chairs/Directors send him names of others (supporters, donors, etc.) who should receive copies. Reza stated that a BCOE Council of Advisors meeting is scheduled for Friday (12/11). The meeting will include updates to BCOE strategic plans and sessions with the Chancellor and EVC/P. Lastly, he stated that a Dean's Office staff luncheon has been scheduled for December 16th.

No items were added to the agenda.

2. Approval of minutes – Pat
The minutes of the November 23, 2015 meeting were unanimously approved.

3. Senate Updates – Reza
Venky reported that the results of the Academic Senate's Cluster Hire survey have been received. There were about 250 responses (out of 650 UCR faculty). The Senate is discussing how best to report these results since there were 120-130 individual comments included in the responses. Also, it was noted that the proposal to add another BCOE faculty member to the Senate's Executive Committee was tabled five years ago. It was recommended that this proposal be revived.

4. Proposed changes to ABET Criteria – Sharon
Sharon reported that ABET is proposing to make revisions to its review criteria. The previous A-K Criteria would be condensed to a list of 1-7 Criteria. The shorter list of Criteria would be more general and would not include hard to measure items such as "lifelong learning." The changes would take effect next year. Sharon will send out a link to ABET's proposed changes. She will be meeting with department undergrad advisors in mid-January and will discuss these proposed ABET changes with them. It is unclear whether BCOE would fall under the old or new Criteria at its next review (in 2018). Sharon suggested that BCOE provide comments by ABET's June 2016 deadline.

5. Reduction of Upper Division Units – Sharon
Sharon referenced the documents attached to the agenda. She indicated that during the recent UC budget negotiations, Janet Napolitano agreed with the Governor's request to try to reduce upper division major courses so that students could graduate faster. The goal is to reduce the number of upper division major courses to no more than 45 units. A related effort is to develop pathways for students to graduate in three years. Colleges of engineering at UCI and UCB have developed 3-year graduation plans but these plans assume that freshmen have taken AP physics, math and chemistry before being admitted. Reza informed the UC Provost that condensing curriculum may not be in the best interests of the state and could put UC in a competitive disadvantage when recruiting high-quality students. Also, condensed engineering curricula may cause ABET accreditation problems. Sharon requested that departments use UCI's template for reporting required and elective courses and send her possible 3-year graduation plans by March 2016. Departments will need to justify why 3-year graduation plans aren't feasible for specific degrees. UCR needs to provide a campus report to UCOP by June 16, 2016. It was noted that changing breadth requirements from upper division to lower division and changing organic chemistry from upper to lower division eliminates several upper division units. Charts included with the documentation denote that most UC engineering degrees require 180-190 units. BCOE degrees require between 180 units (MSE) to 194 units (Environmental Engineering).

6. BCOE-COA Meeting (December 11) – Reza
See notes under agenda item 1 above.

7. Renovation – Pat
Pat reported that the 2nd Floor Bourns B Renovation project is moving forward as planned. Initial indications are that most dry labs on the 2nd floor will be able to be converted to wet labs within the budget limit. Two rooms will remain dry labs since they are located above the Clean Room and the building's main Electrical Room. The East wing will be renovated first followed by the West wing 4-5 months later. During the current design phase of the project, it was discovered that most rooms on the 1st floor of Bourns B are on a recirculating air system. Chemical labs should not be on such a system so the Dean has requested additional funding from campus to fix this problem. In the meantime, we will be working with EH&S to develop appropriate operational plans for 1st floor labs.

8. Diversity Statement Requirement for Academic Programs – Reza
Reza called attention to the letter from UCR's Vice Provost for Academic Personnel that requires the inclusion of a Diversity Statement from all faculty applicants to current searches. All previous applicants to these searches will need to be notified of this change and be given an opportunity to provide such a Statement. It was noted that new PhD's will likely not be able to provide evidence of

significant diversity efforts. No candidates can be interviewed until they have been given an opportunity to provide this Statement.

9. Graduate Education – Ravi
Ravi distributed a summary of MRB1 space requirements. The Programming Team's space recommendations include 20% wet 2, 20% dry 1 and the remaining space split between wet 1 and flex 3 space. In addition, the building will include a 3,500 cage Vivarium and possible Imaging Suite and Computational Core. The inclusion of an Imaging Suite and/or Computational Core will depend on funding. The VCRED is working on Imaging and Computational Core options. The building is still being designed to house 40 wet lab and 10 computational faculty.

Reza added that Joe Childers will attend the 1/11/16 Chairs/Directors meeting to discuss grad student funding.

Mitch noted that his office is preparing Strategic Investment Fund (SIF) proposals for Bioengineering, the Clean Room and MSOL Program. He asked that any additional proposal topics be sent to him as soon as possible. The campus' due date for these SIF proposals is 1/4/16.

10. Undergraduate Education – Sharon
Sharon reminded participants of the 12/10 RAIN workshop in WCH 205/206. This presentation will be given jointly by UCR Police and Susan Allen Ortega (Assistant VC, Health & Wellness).

The Chinese universities that are providing GPP students are also interested in sending upper division undergrads to BCOE for a summer research experience (similar to the REU Program). The BCOE department providing this experience would receive $3-4K per student. It was noted that significant staff time could be needed to obtain appropriate visas for these students. Also, faculty have capacity limits in their labs and we would not want to displace UCR undergrads that are interested in obtaining summer lab experiences. As such, it was suggested that a senior design course model could be used for these Chinese students which would minimize impact on departmental faculty and staff. This program could be run through UNEX which would provide housing and visa services.

11. Department Updates
Kambiz reported that a meeting with Pearson representatives is scheduled for Friday (12/11). This meeting will include representatives from the Grad Division, Financial Aid Office and Multimedia Services and will include a joint lunch with BCOE's Council of Advisors. An orientation for new instructors is scheduled for today. Additional instruction space is needed for MSOL courses due to space and equipment limitations in the Hyper-Instruction Room. MSOL exams are being successfully administered through Examity. Reza reminded participants that faculty mentors of MSOL students are given the same credit in their files as mentoring any other MS student. Also, faculty mentors receive $600 per MSOL student. Kambiz reported that the new Data Science Specialization has been approved. Reza asked that additional courses be offered per Specialization to give MSOL students more options. Lastly, Sharon asked if special accommodations are provided for disabled MSOL students. It was unclear if such accommodations are needed for on-line students.

No other topics were discussed.

APPENDIX 1

UNIVERSITY OF CALIFORNIA
UC RIVERSIDE
BOURNS COLLEGE OF ENGINEERING

Chairs' & Center Directors' Meeting

December 7, 2015

Agenda

Winston Chung Hall – Room 443

1.	Welcome - Request for Agenda Items from the Floor	Reza
2.	Approval of Minutes from November 23, 2015 Meeting	Pat
3.	Senate Updates	Venky
4.	Proposed changes to ABET Criteria	Sharon
5.	Reduction of Upper Division Units	Sharon
6.	BCOE – COA Meeting (December 11)	Reza
7.	Renovation	Pat
8.	Diversity Statement Requirement for Academic Positions	Reza
9.	Graduate Education	Ravi
10.	Undergraduate Education	Sharon
11.	Department Updates	Chairs/Directors

Please note next meeting will be on: Monday, January 11, 2016

(No meeting on Monday, December 21, 2015)

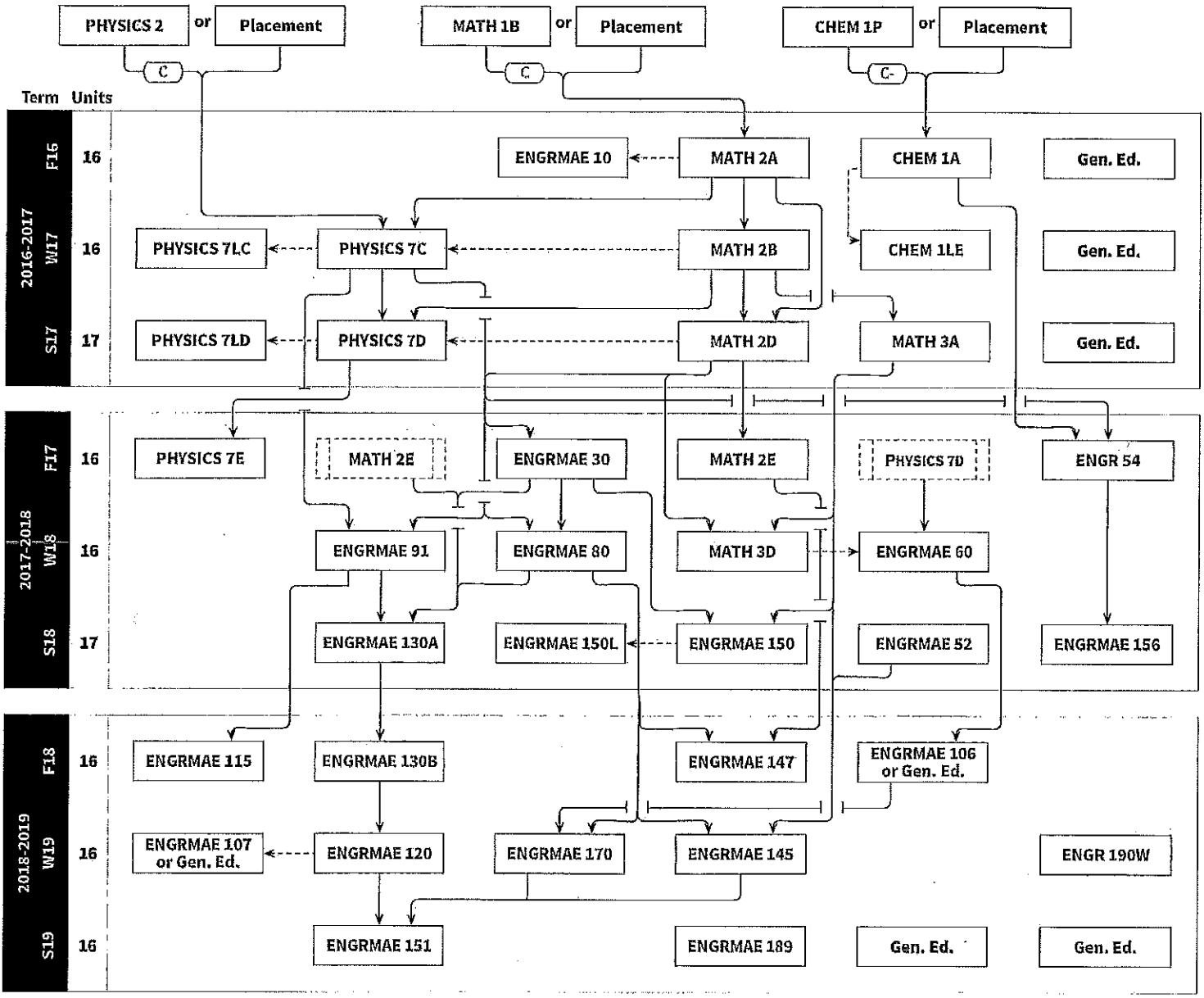
Future Meeting Dates

2015	2016
~~Monday, September 28~~	Monday, January 11
~~Monday, October 12~~	Monday, January 25
~~Monday, October 26~~	Monday, February 8
~~***Friday***, November 6~~	Monday, February 22
~~Monday, November 23~~	Monday, March 7
~~Monday, December 7~~	Monday, March 21
	Monday, April 4
	Monday, April 18
	Monday, May 2
	Monday, May 16
	Monday, June 6
	Monday, June 20
	Friday, July 1

UCI

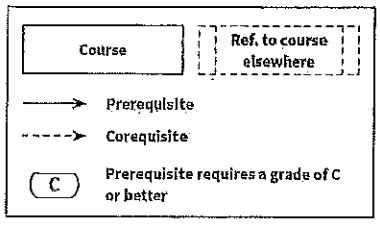
Mechanical Engineering – 3-Year With Subject Reduction

Prerequisite Flowchart (2016-2017)



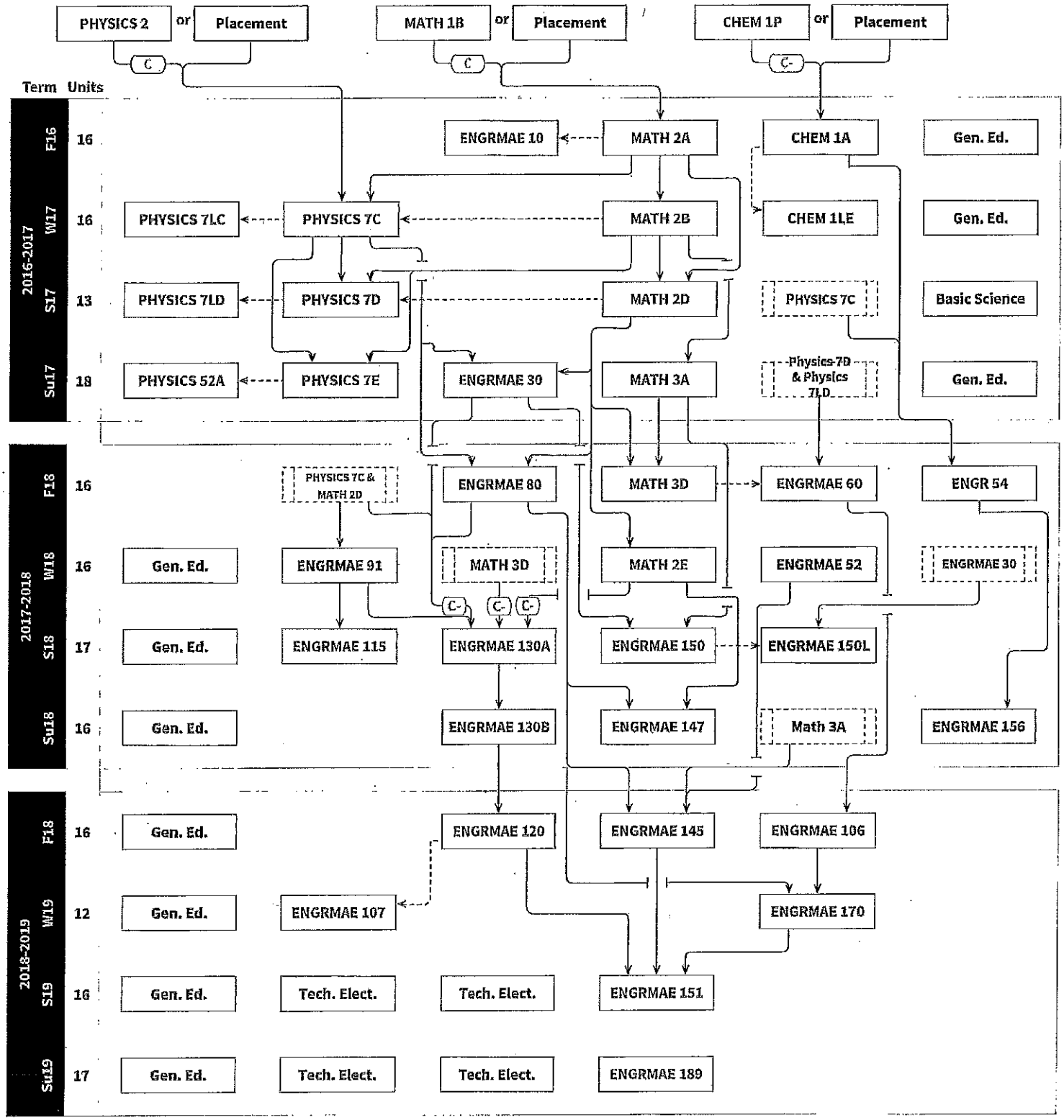
+ Removed 4 Engineering Technical Electives and changed the ENGRMAE 106 and ENGRMAE 107 requirements to be a choice between the two lab courses. Reduces Engineering Topics from 97 to 77 units (-20%). All specializations are eliminated.
+ Removed 6 units of Math and Basic Science from 51 to 45 units (-12%).
+ Removed 1 GE (3rd year language).
+ Nominal subject requirements reduced from 189 to 158. Students have 22 units of free electives.
+ Upper division required units reduced from 73 to 53 (-27%).
+ Three GE courses are not accounted for in the above program necessitating either AP or summer work in addition to the 22 free elective units.
+ 14 courses were moved from the 4-year sequence and would need to be taught as off-sequence offerings. This program would likely result in a measurable increase in attrition in the 2nd year due to heavy course load. Students requiring remedial coursework would be at a significant disadvantage with few opportunities to return to main sequences.

+ The loss of upper-division coursework would be more sensible if ABET adjusted expectations for professional practice from the B.S. to the M.S. which would have a broader scope than just UC.
+ Reducing upper-division units below those of general education for a professional program sends a troubling message to prospective students. It does not seem appropriate that CSU should provide substantially greater technical subject depth than UC in a professional discipline.

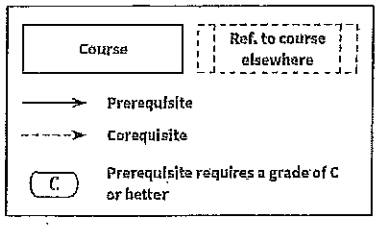


Mechanical Engineering – 3-Year Trivial Program

Prerequisite Flowchart (2016-2017)

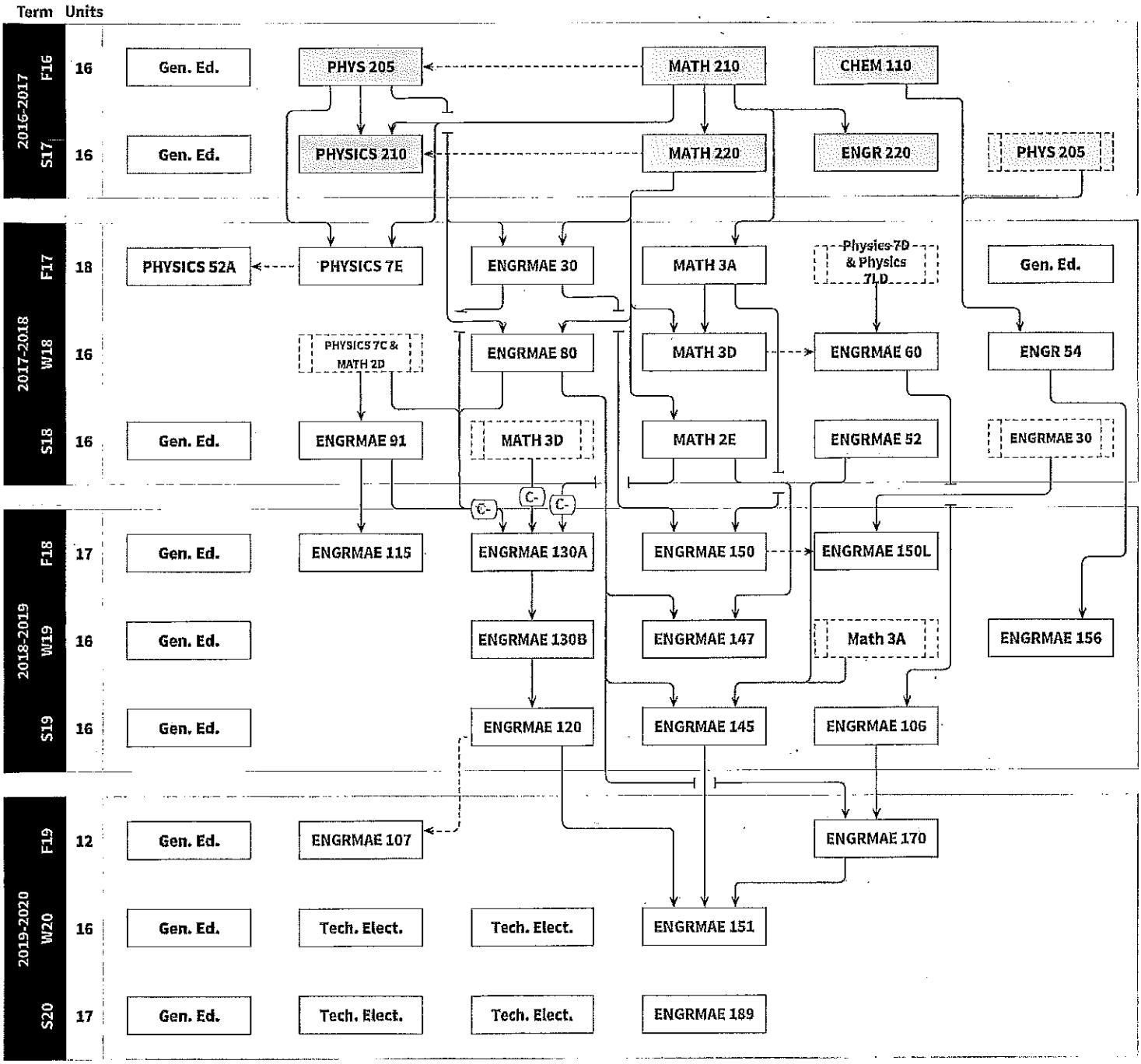


+ All terms are moved forward treating summer as a regular term.
+ Nearly all courses after the first year are resequenced.
+ Students have no opportunities for internships and reduced opportunities for study abroad or other enrichment activities.

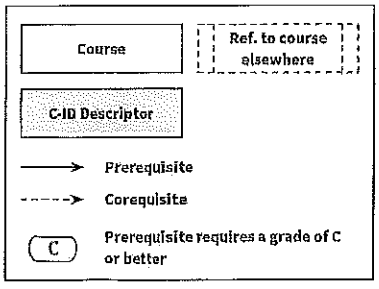


Mechanical Engineering 1+3 Program

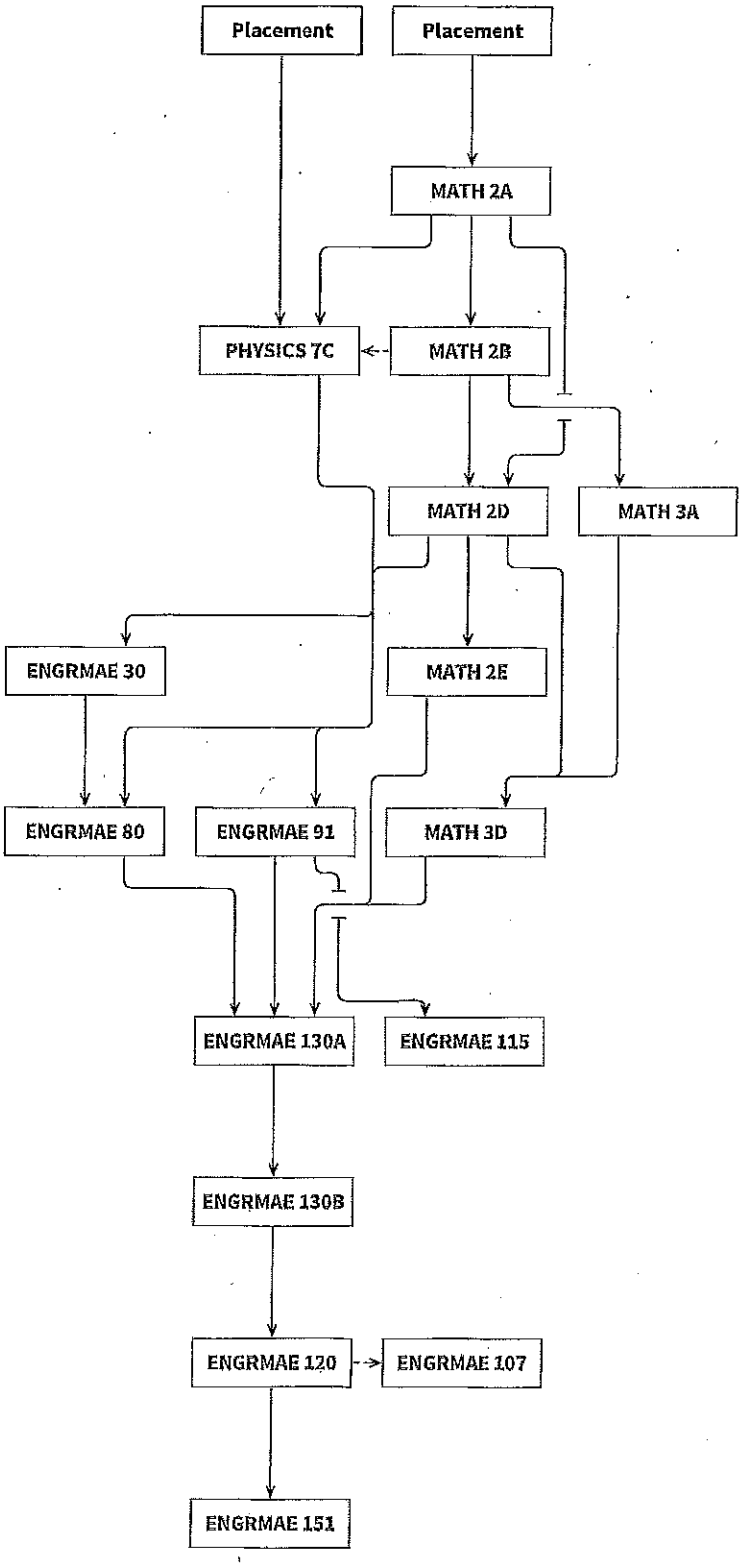
Prerequisite Flowchart (2016-2017)



+ First year of study is completed at CCC. All courses are available on all campuses.
+ Students would not meet UC transfer subject requirements which would need to be modified by reducing amount of General Education but lower-division writing could be preserved.
+ Students that required remedial coursework would receive that at CCC where offerings are more plentiful.



Fluid/Thermal Prerequisite Sequence for Mechanical Engineering



Calculus and Physics-readiness is not enforceable through admission selection. Up to a quarter of matriculants may not be calculus-ready on some UC campuses.

Single-variable differential calculus: Requires sufficient precalculus preparation which varies particularly at low API schools.

Newtonian mechanics: Requires differentiation of real functions
Single-variable integral calculus: Requires differentiation of real functions

Multiple-variable integral calculus: Requires differentiation and integration of real functions
Linear algebra: Requires integration of real functions

Statics: Requires kinematics and mechanics of motion and multivariate integration
Vector calculus: Requires multivariate integration

Dynamics: Requires kinematics and mechanics of motion and multivariate integration, moments, force balance
Thermodynamics: Requires multivariate integration, mass, forces
Differential equations: Requires integration of real functions of multiple variables, eigenfunctions

Fluid Mechanics: Consolidates understanding of dynamic systems, fluids, thermodynamics, and techniques for solving differential equations with multiple independent variables and of vector fields.
Applied thermodynamics: Requires thermodynamics fundamentals

Viscous and compressible flows: Requires fluid mechanics of incompressible fluids.

Heat transfer: Requires viscous fluid flow and thermdynamics
Fluid/thermal lab: Requires mechanics of compressible and incompressible fluids, heat transfer

Mechanical engineering design: Requires ability to analyze properties of fluid and thermal components

EAC Table 5-1 3-Year Modified Curriculum

Mechanical Engineering

Removed subjects highlighted

Year/ Quarter	Course (Department, Number, Title)	Indicate Whether a Course is Required, Elective, or Selected Elective, by an R, an E, or an SE.	What does this course enable one to do ?
1: Fall	Mathematics 2A Single-Variable Calculus	R	Introduction to derivatives, calculation of derivatives of algebraic and trigonometric functions. Needed to understand the engineering discipline.
	MAE 10 Introduction to Engineering	R	Introduction to the solution of engineering problems through the use of the computer.
	Chemistry 1A General Chemistry	R	Basics of chemistry (Atomic structure; general properties of the elements; covalent, ionic, and metallic bonding). Needed to understand chemical/material interactions.
	General Education	E	
1: Winter	Mathematics 2B Single-Variable Calculus	R	Introduction to derivatives, calculation of derivatives of algebraic and trigonometric functions. Needed to understand the engineering discipline.
	Physics 7C Classical Physics	R	Understanding of force, energy, momentum, rotation, and gravity. Needed to understand the engineering discipline.
	Physics 7LC Classical Physics Laboratory	R	
	Chemistry 1LE Accelerated General Chemistry Lab	R	
	General Education	E	
1: Spring	Mathematics 2D Multivariable Calculus	R	Introduction to multi dimensional derivatives, calculation of derivatives of algebraic and trigonometric functions. Needed to understand the engineering discipline.
	Physics 7D Classical Physics	R	Understanding of electricity and magnetism. Needed to understand the engineering discipline.
	Physics 7LD Classical Physics Laboratory	R	
	Basic Science	SE	

2: Fall	Mathematics 3A Linear Algebra	R	Systems of linear equations, matrix operations, determinants. Needed to model complex systems with multiple equations and unknowns.
	Physics 7E Classical Physics	R	Understanding of Fluids; oscillations; waves; and optics. Needed to understand the key growth areas of the engineering discipline (wearable technology, sensing).
	Physics 52A Fundamentals of Experimental Physics	R	
	MAE 30 Statics	R	Needed to understand static structures (buildings and structural systems).
	General Education	R	
2: Winter	Mathematics 3D Elementary Differential Equations	R	Linear differential equations. The basis for modeling all motion in engineering systems
	MAE 80 Dynamics	R	Needed to understand dynamic structures and systems (i.e. automotive systems, airplanes, etc.)
	ENGR 54 Principles of Materials Science and Engineering	R	Needed to understand how structures and systems change based on material properties.
	MAE 60 Electric Circuits or EECS 70A Network Analysis I	SE	Design and analysis of analog circuits. Needed to understand how mechanical systems interface to electronic systems.
2: Spring	Mathematics 2E Multivariable Calculus	R	The differential and integral calculus of vector-valued functions. Implicit and inverse function theorems. Needed to understand complex fluid flow.
	MAE 52 Computer Aided Design	R	The use of computer aided drawing and modeling software to design and model complex systems.
	MAE 91 Introduction to Thermodynamics	R	First and second law of thermodynamics with applications to engineering systems and design. Needed to understand the basics of heating and air conditioning.
	ECON 20A Basic Economics I	R	Basics of economics. Needed to understand the economic impact of engineering systems. Used to meet ABET program criteria.
3: Fall	MAE 112 Propulsion or MAE 115 Applied Engineering Thermodynamics	R	Application of thermodynamic principles to practical engineering problems; power cycles, refrigeration cycles, multicomponent mixtures, air conditioning systems, combustion, and compressible flow. Needed to understand complex systems like engines.
	MAE 130A Introduction to Fluid Mechanics	R	Fundamental concepts of fluid mechanics; fluid statics; fluid dynamics; Bernoulli's equation; control-volume analysis; basic flow equations of

			conservation of mass. Needed to understand fluid structural interactions.
	MAE 150 Mechanics of Structures	R	Understanding Stresses, strains. Torsion, Beam Bending and deflection. Needed to design and analyze complex structures.
	MAE 150L Mechanics of Structures Laboratory	R	
	ENGR 190W Communications in the Professional World	R	Technical and scientific writing for engineers. Oral presentation with video monitoring. Engineers must know how to communicate.
3: Winter	MAE 130B Introduction to Viscous and Compressible Flows	R	Intro to viscous and turbulent flows. Needed to understand fluid flows in pipes and other systems.
	MAE 147 Vibrations	R	Analysis of structural vibrations of mechanical systems. Needed to model of complex vibratory systems.
	MAE 155 Composite Materials and Structures OR MAE 156 Mechanical Behavior and Design Principles OR MAE 157 Lightweight Structures	R	Design and modeling of composite and lightweight structures. Necessary to design structural systems.
	General Education	E	
3: Spring	MAE 106 Mechanical Systems Laboratory	R	Experiments in linear systems, including op-amp circuits, vibrations, and control systems. Needed to sense and control mechanical systems.
	MAE 120 Heat and Mass Transfer	R	Fundamentals of heat and mass transfer (Conduction, convection and laminar and turbulent flows, radiation heat transfer, and combined modes of heat and mass transfer). Needed to design and model complex systems where heat and mass is transferred (stoves, heating systems).
	MAE 145 Theory of Machines and Mechanisms	R	Understanding the principles of motors, gears, cam design, gear train analysis, and the kinematic and dynamic analysis of linkages, together with an introduction to robotics.
	General Education	E	
4: Fall	MAE 107 Fluid Thermal Science Laboratory	R	Fluid and thermal engineering laboratory. Experimental analysis of fluid flow, heat transfer, and thermodynamic systems.
	MAE 170 Introduction to Control Systems	R	Feedback control systems. Modeling, stability, and systems specifications. Root locus, Nyquist, and Bode methods of analysis and design. Needed to understand control system design for complex system, i.e. automotive cruise control.
	General Education	E	

4: Winter	MAE 151 Mechanical Engineering Design	R	A comprehensive group design project experience that involves identifying customer needs, idea generation, reverse engineering, preliminary design, standards, prototype development, testing, analysis, and redesign of a product involving fluid, thermal, and mechanical components. Capstone design is required by ABET.
	Technical Elective	SE	
	Technical Elective	SE	
	General Education	E	
4: Spring	MAE 189 Senior Project-Special Topics	R	Group or individual senior project of theoretical or applied nature involving design. Capstone design is required by ABET.
	Technical Elective	SE	
	Technical Elective	SE	
	General Education	E	
	TOTAL ABET BASIC LEVEL REQUIREMENTS		
OVERALL TOTAL FOR DEGREE	**189**		
	PERCENT OF TOTAL		
	MODIFIED ABET BASIC LEVEL REQUIREMENTS		
MODIFIED TOTAL FOR DEGREE	**158**		
	MODIFIED PERCENT OF TOTAL		
Totals must satisfy one set	Minimum quarter credit hours		
	Minimum percentage		

UCI

Accounting of Engineering Programs 2015-2016

Program	Units	UD Reqts	M&BS	ET (Des)	Comp (A)	GE	Other
Aerospace	185	73	51	93 (27)		41	
Biomedical	186	70	57	88 (36)		41	
Chemical	192	70	70	81 (19)		41	
Civil	188	76	49	98 (21)		41	
Computer	191	70	49	105 (48)		37	
CSE (EAC)	188	60	50	101 (30)		37	
CSE (CAC)	188	60	50		64 (33)	37	37
Electrical	188	75	55	96 (29)		37	
Environmental	189	60	62	86 (14.5)		41	
Materials	189	69	56	92 (19)		41	
Mechanical	189	73	51	97 (21.5)		41	

UD Reqts: 100-199 numbered courses specified by the program either explicitly or implicitly. Students may be able to satisfy a small number of requirements with 1-99 numbered courses.
M&BS: Units that satisfy ABET defined Math and Basic Science requirements.
ET (Des): Units that satisfy ABET EAC defined Engineering Topics with unit equivalents for design-specific content in parentheses.
Comp (A): Units that satisfy ABET CAC defined Computing Topics with advanced topic units in parentheses.
GE: Units that count toward General Education that do not satisfy Math and Basic Science, Engineering Topics, or Computing Topics. These may include professional topics required by the major such as Economics, Technical Writing, Environmental Health.
Other: Units specified by the program that don't fall into any of the above content categories. For CSE (CAC) these are otherwise Engineering Topics not considered Computing Topics which have no other accounting category.

EAC Table 5-1 *3-Year Modified Curriculum*

Mechanical Engineering

Removed subjects highlighted

Year/ Quarter	Course (Department, Number, Title)	Indicate Whether a Course is Required, Elective, or Selected Elective, by an R, an E, or an SE. [1]	Math & Basic Sciences	Engineering Topics *Check if Contains Significant Design (√)*	General Education	Other	Prerequisites
1: Fall	Mathematics 2A Single-Variable Calculus	R	4				
	MAE 10 Introduction to Engineering	R		4 (1)(√)			
	Chemistry 1A General Chemistry	R	4				
	General Education	E			4		
1: Winter	Mathematics 2B Single-Variable Calculus	R	4				Mathematics 2A
	Physics 7C Classical Physics	R	4				
	Physics 7LC Classical Physics Laboratory	R	1				
	Chemistry 1LE Accelerated General Chemistry Lab	R	3				Chemistry 1A
	General Education	E			4		
1: Spring	Mathematics 2D Multivariable Calculus	R	4				Mathematics 2A & Mathematics 2B
	Physics 7D Classical Physics	R	4				Physics 7C & Mathematics 2B
	Physics 7LD Classical Physics Laboratory	R	1				
	Basic Science	SE	4				
2: Fall	Mathematics 3A Linear Algebra	R	4				Mathematics 2B
	Physics 7E Classical Physics	R	4				Physics 7C & Mathematics 2B
	Physics 52A Fundamentals of Experimental Physics	R	2				
	MAE 30 Statics	R		4			Physics 7C &

[1] **Required** courses are required of all students in the program, **elective** courses (often referred to as open or free electives) are optional for students, and **selected elective** courses are those for which students must take one or more courses from a specified group.

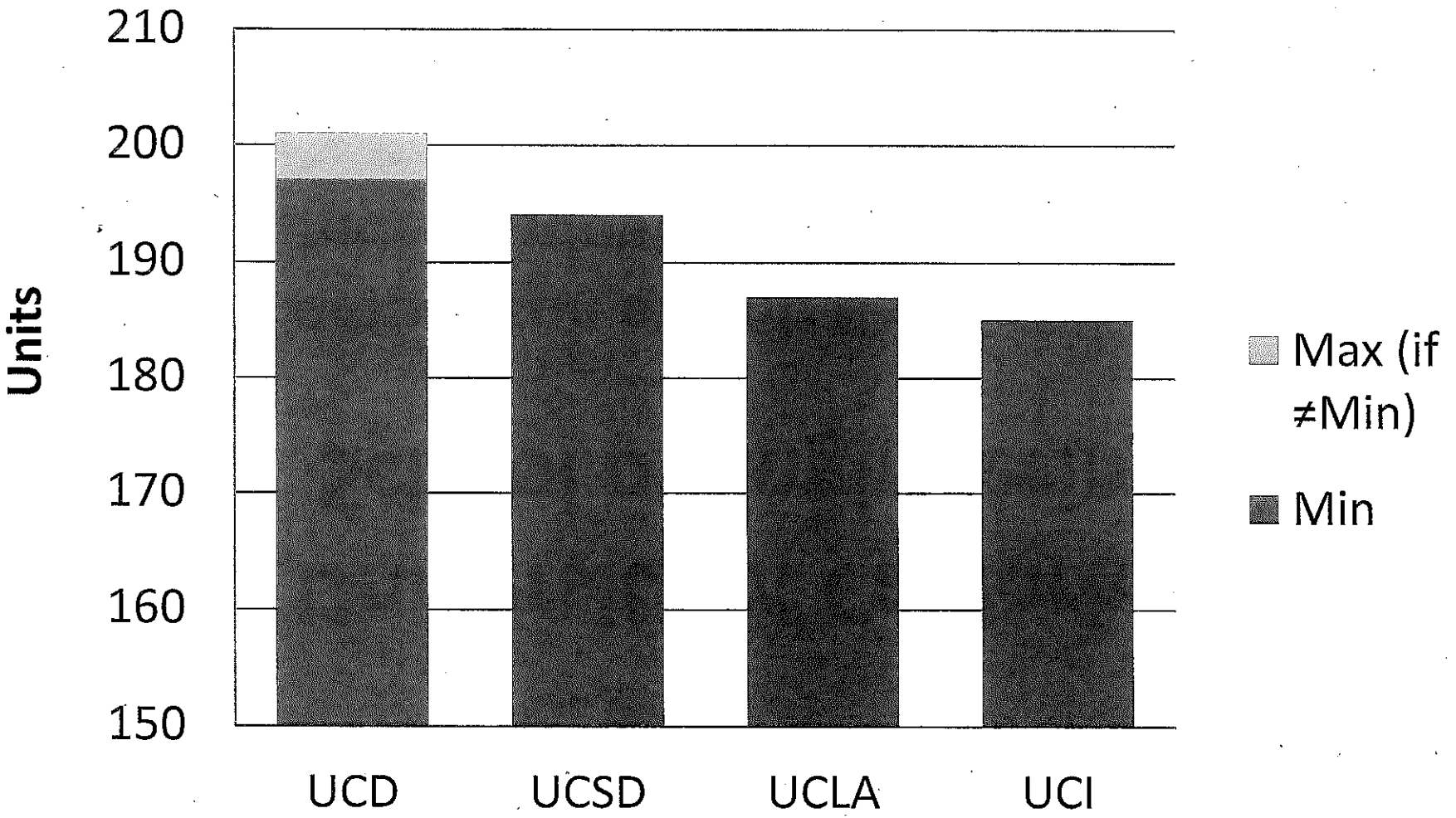
							Mathematics 2D
	General Education	R			4		
2: Winter	Mathematics 3D Elementary Differential Equations	R	4				Mathematics 3A & Mathematics 2D
	MAE 80 Dynamics	R		4 (0.5)(√)			Mathematics 2D & Physics 7C
	ENGR 54 Principles of Materials Science and Engineering	R		4			Chemistry 1A & Physics 7C
	MAE 60 Electric Circuits or EECS 70A Network Analysis I	SE		4 (2)(√) or 4 (1)(√)			Physics 7D & Physics 7LD
2: Spring	Mathematics 2E Multivariable Calculus	R	4				Mathematics 2D
	MAE 52 Computer Aided Design	R		4 (0.5)(√)			
	MAE 91 Introduction to Thermodynamics	R		4 (0.5)(√)			Mathematics 2D & Physics 7C
	ECON 20A Basic Economics I	R			4		
3: Fall	MAE 112 Propulsion or MAE 115 Applied Engineering Thermodynamics	R		4 (1)(√) or 4 (2)(√)			MAE 130B/MAE 91
	MAE 130A Introduction to Fluid Mechanics	R		4			Physics 7C & Mathematics 2D & Mathematics 2E & Mathematics 3D & MAE 30 & MAE 80 & MAE 91. All with a grade of C- or better.
	MAE 150 Mechanics of Structures	R		4 (2)(√)			MAE 30 & Mathematics 3A
	MAE 150L Mechanics of Structures Laboratory	R		1			MAE 30
	ENGR 190W Communications in the Professional World	R			4		
3: Winter	MAE 130B Introduction to Viscous and Compressible Flows	R		4 (1)(√)			MAE 130A
	MAE 147 Vibrations	R		4 (1)(√)			MAE 80 & Mathematics 2E

	MAE 155 Composite Materials and Structures OR MAE 156 Mechanical Behavior and Design Principles OR MAE 157 Lightweight Structures	R		4 or 4 (2)(√) or 4 (2)(√)			ENGR 54 & MAE 150/ENGR 54/ MAE 150
	General Education	E			4		
3: Spring	MAE 106 Mechanical Systems Laboratory	R		4 (2)(√)			MAE 60
	MAE 120 Heat and Mass Transfer	R		4			MAE 130B
	MAE 145 Theory of Machines and Mechanisms	R		4 (2)(√)			MAE 52 & MAE 80 & Mathematics 3A
	General Education	E			4		
4: Fall	MAE 107 Fluid Thermal Science Laboratory	R		4 (1)(√)			MAE 120 Coreq
	MAE 170 Introduction to Control Systems	R		4 (2)(√)			MAE 80 & MAE 106
	General Education	E			4		
4: Winter	MAE 151 Mechanical Engineering Design	R		4 (3)(√)			MAE 120 & MAE 145 & MAE 170
	Technical Elective	SE		4			
	Technical Elective	SE		4			
	General Education	E			4		
4: Spring	MAE 189 Senior Project-Special Topics	R		4 (4)(√)			
	Technical Elective	SE		4			
	Technical Elective	SE		4			
	General Education	E			5		
TOTAL ABET BASIC LEVEL REQUIREMENTS			51	97 (21.5-25.5) (√)	41		
OVERALL TOTAL FOR DEGREE	**189**						
PERCENT OF TOTAL			**27%**	**51%**	**22%**		
MODIFIED ABET BASIC LEVEL REQUIREMENTS			45	77 (21.5-23.5)	36		
MODIFIED TOTAL FOR DEGREE	**158**						
MODIFIED PERCENT OF TOTAL			**25%**	**42.7%**	**20%**		
Totals must satisfy one set	Minimum quarter credit hours		**48 hrs.**	**72 hrs.**			
	Minimum percentage		25%	37.5%			

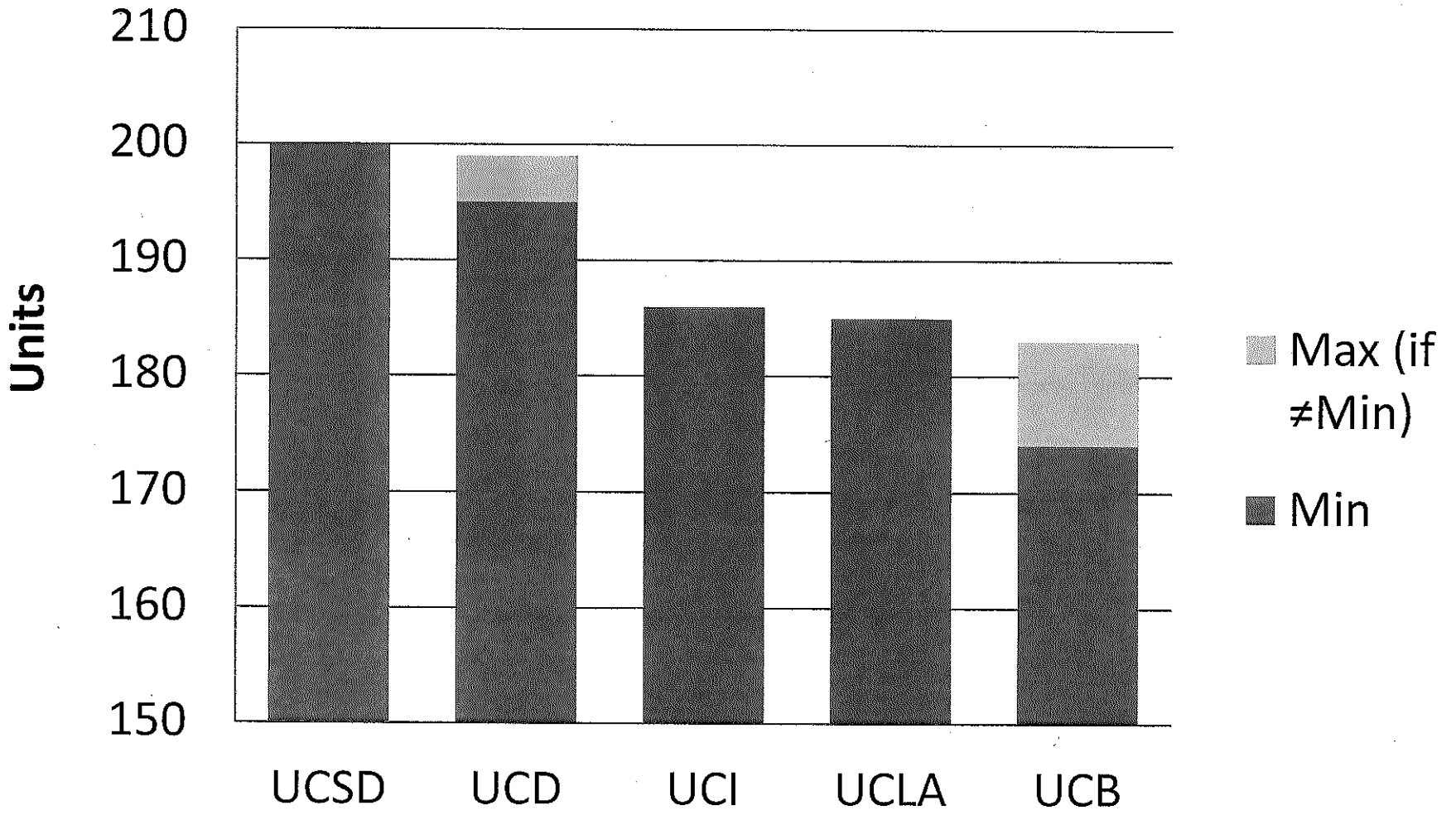
University of California
School of Engineering

Comparison of Unit Requirements
Undergraduate Degree Programs

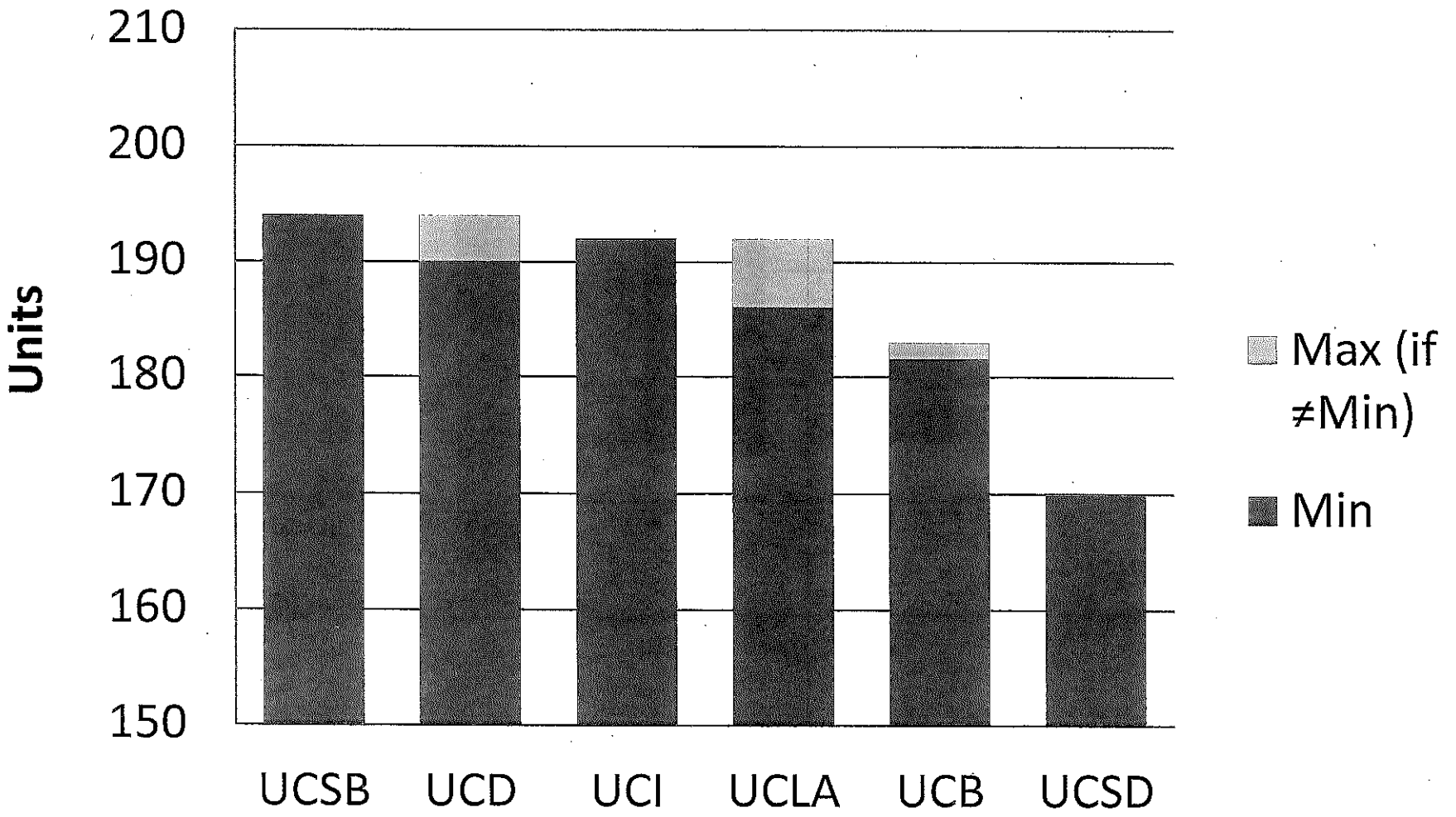
Aerospace Engineering



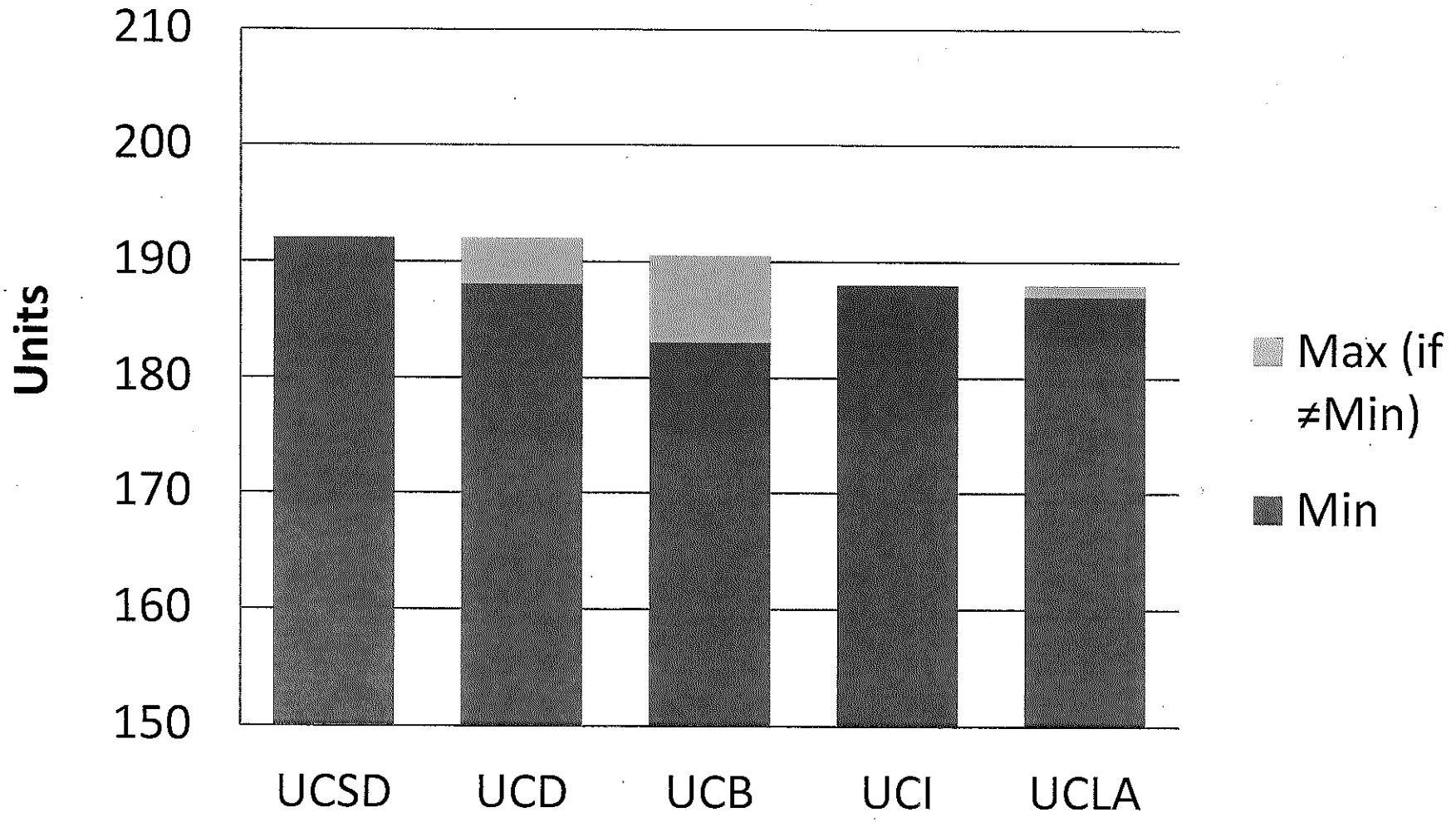
Bioengineering



Chemical Engineering



C&EE


Units
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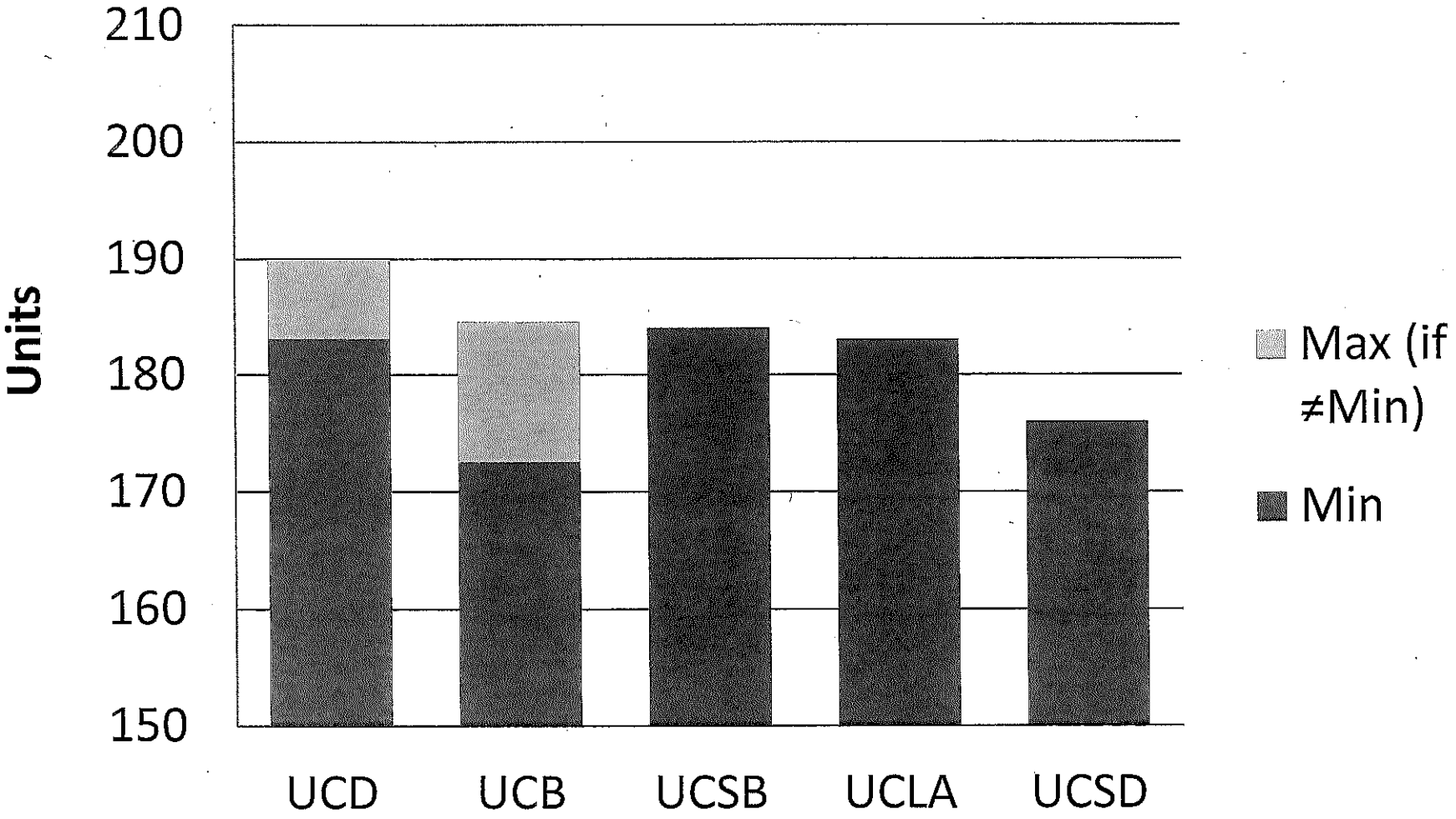
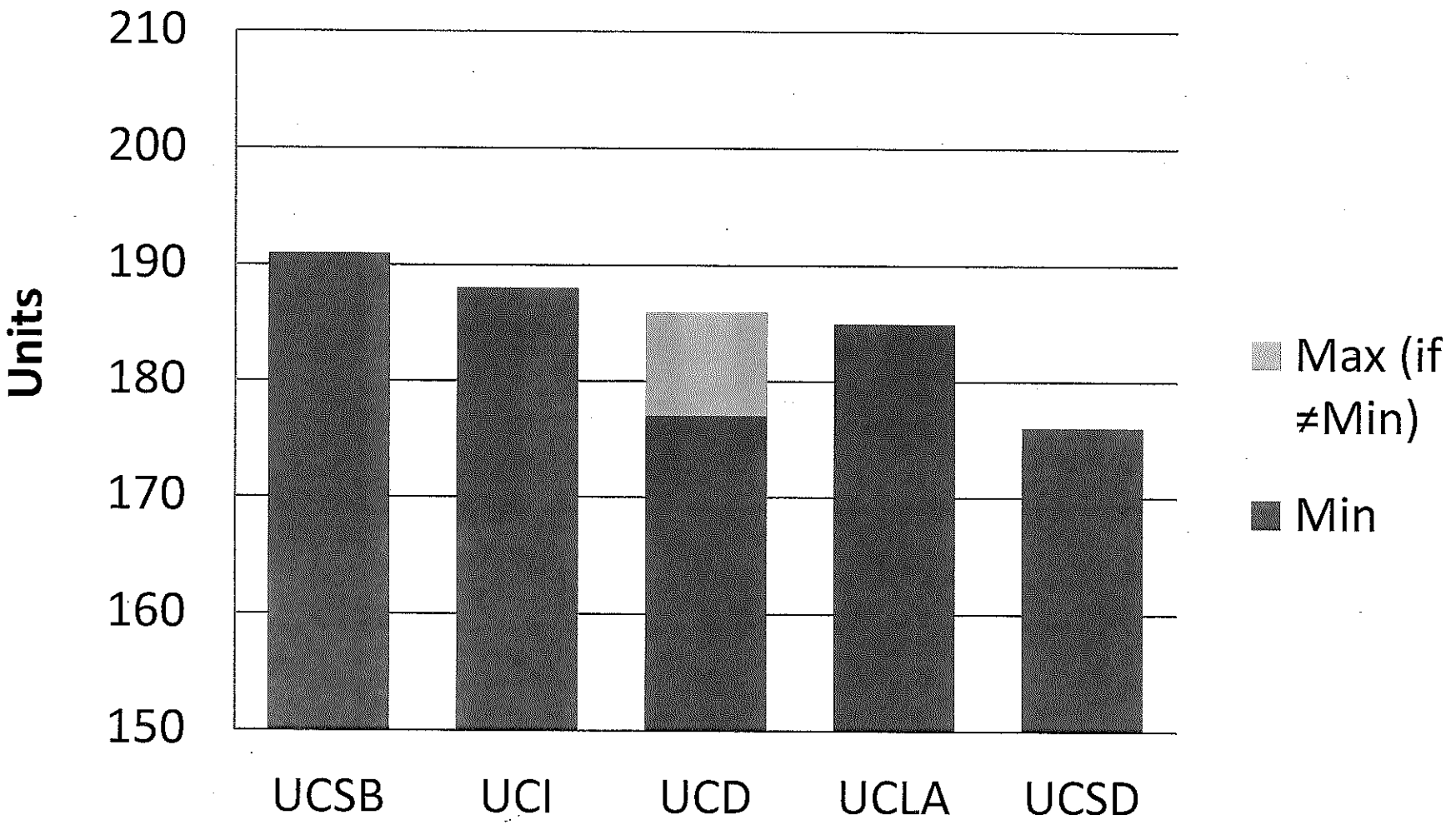
190
180
170
160
150
UCSD
UCD
UCB
UCI
UCLA
Max (if ≠Min)
Min

Computer Science



CS&E


Units
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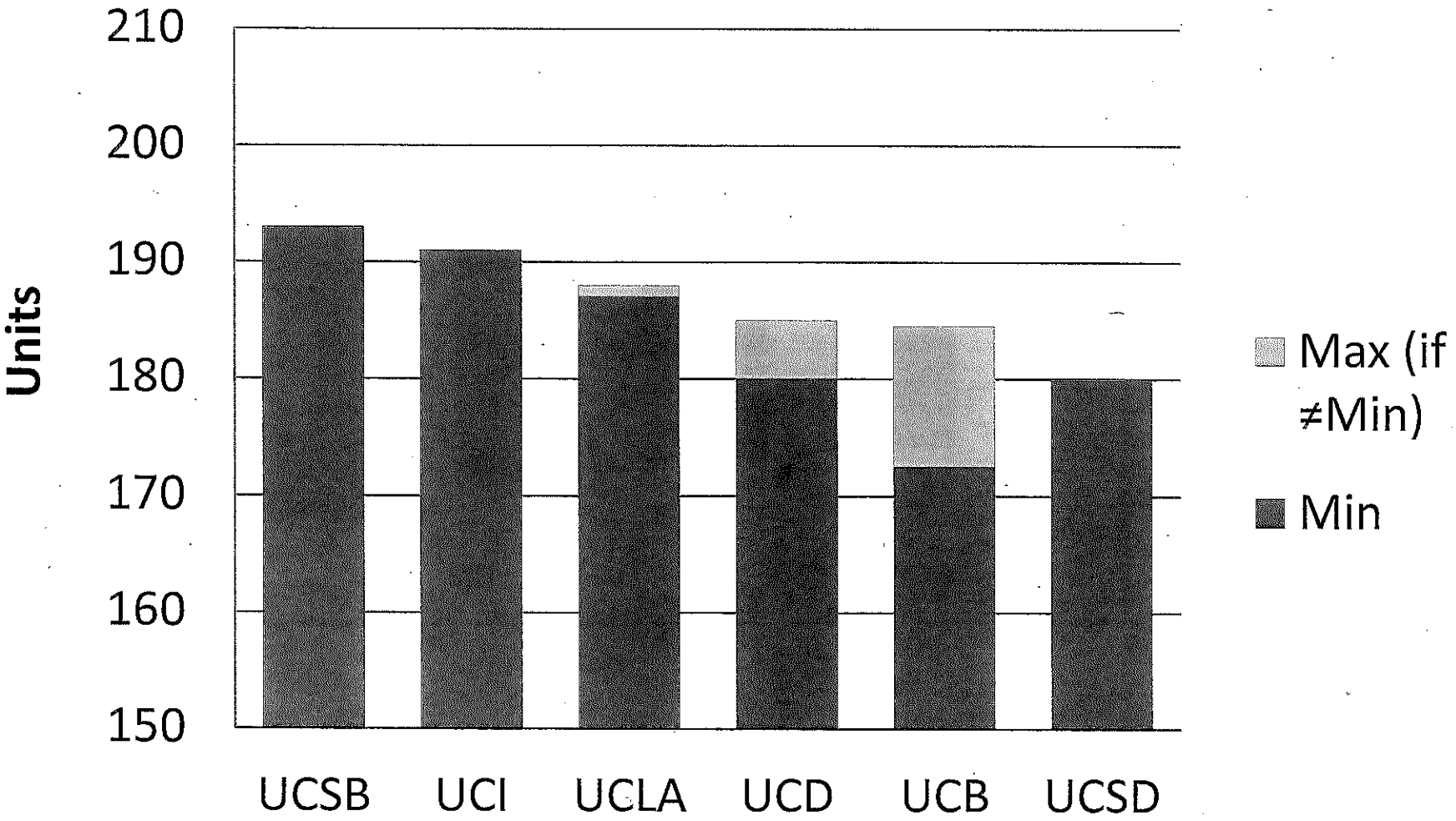
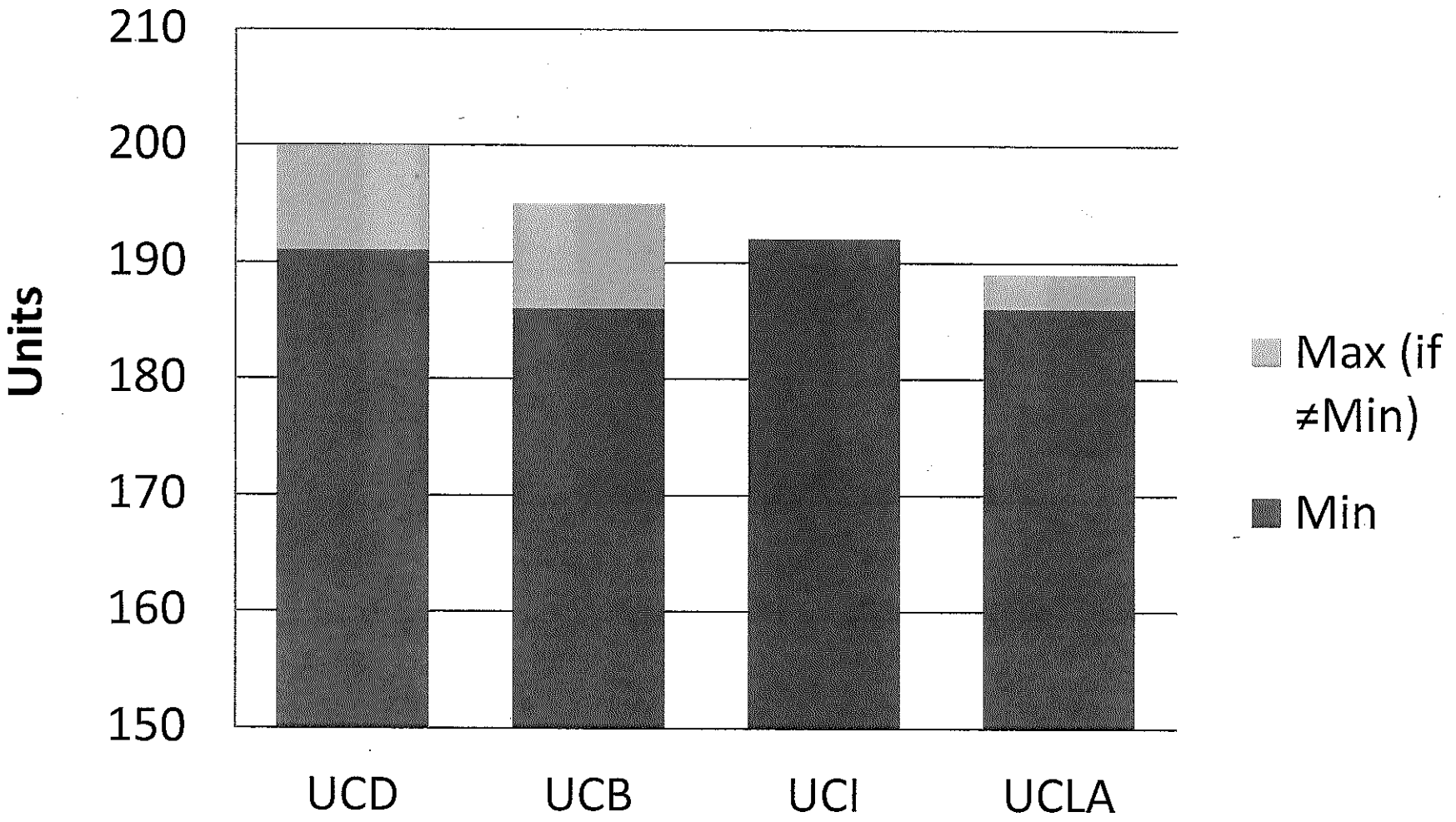
UCSB
UCI
UCD
UCLA
UCSD
Max (if ≠Min)
Min

Electrical Engineering



MS&E


Units
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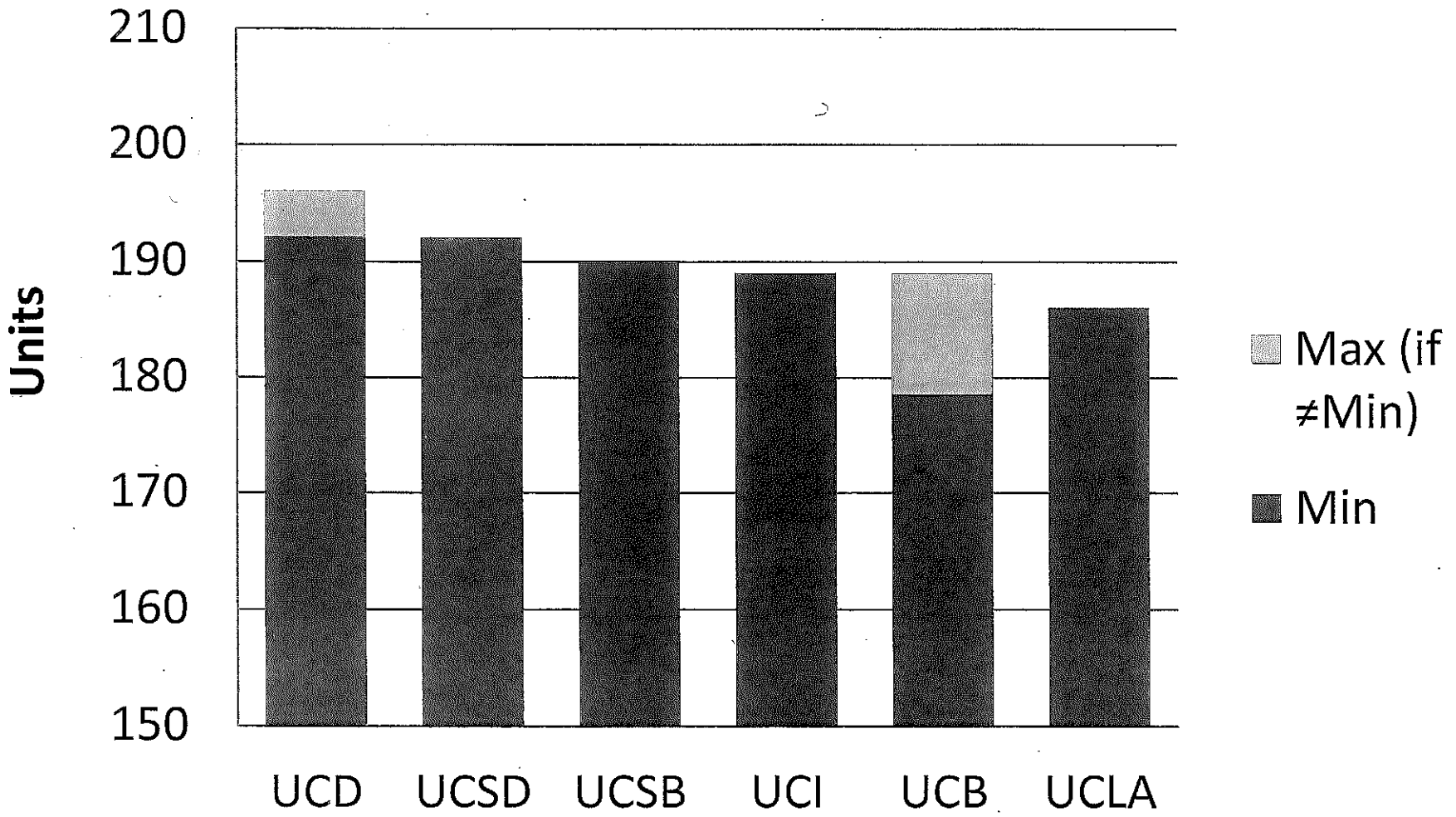
UCD
UCB
UCI
UCLA
Max (if ≠Min)
Min

Mechanical Engineering



MAJOR REQUIREMENTS (UCOP NUMBER 8)
PROJECT CHARTER

Name:	**Major Requirements (UCOP Number 8)**
Responsible and Accountable Officers:	**Aimée Dorr, Provost and Executive Vice President, Academic Affairs** **Pamela Brown, Vice President,** **Institutional Research and Academic Planning**
UCOP Point Person:	**Aimée Dorr, Provost and Executive Vice President**

Project Goals: All undergraduate campuses will undertake a comprehensive review of the courses necessary in 75 percent of majors and complete this review by July 1, 2017. The initiative, modeled after UCLA's Challenge 45, has the goal of reviewing the number of courses and reducing those requirements to no more than 45 quarter-equivalent units where possible by eliminating any unnecessary requirements for completion of the major.

Clarifications: The goal is no more than one year (45 quarter-equivalent units) of required upper-division major courses. Major courses will be identified by course number. Because UCLA's Challenge 45 work was, with just one exception, focused on majors in the College of Letters and Science, UCLA will address the remaining 17 majors that fall in the top 75% and are in the schools of engineering, arts & architecture, nursing, and theater, film and television. Curricular review of majors by all campuses will include a summary of current upper division unit requirements and changes after review.

Materials Provided: Two items hav been posted to the SharePoint site since the end of July: (1) an Excel file with all UG degree majors rank ordered for each campus by the number of graduates between 2011-12 and 2013-14 and an indication of the top 75% and (2) a briefing about the curriculum review that UCLA did and UCSD has been doing and information relevant to what campuses will need to do for this project. Other items will be posted when identified.

Responsible and Accountable Officer (RAO): Senior official responsible for ensuring project milestones and goals are received.

UCOP Point Person: UCOP official selected by RAO and responsible for supporting campus point people to achieve project goals. UCOP point person will provide background information on the project, share initial and develop final detailed work plan that includes key deliverables leading to project goal, and provide project updates and final report to RAO.

Cross-Campus Team: The Chancellor and Executive Vice Chancellor/Provost are the RAOs for their campus. They have designated the campus point people to manage local implementation of each programmatic element. Cross-campus team will meet on a regular basis and be supported by the UCOP point person. Cross-campus team produces and coordinates work at each location to ensure achievement of the project goals. Cross-campus team members and UCOP RAOs and point person(s) are listed on the back.

Project Milestones:

Note: UCEP (University Committee on Educational Policy) has volunteered to help coordinate this effort and to provide guidance and best practictices. It MAY also facilitate the resolution of different outcomes for similar majors on different campuses.

- July 13, 2015: Chancellor/EVCP identifies campus point person
- July 20, 2015: RAO identifies UCOP point person
- July 31, 2015: Provost sends Chancellors and EVCPs summary workplan and list of campus point people for all programmatic items
- September 28, 2015: Project kick-off meeting; because of similarity of point persons, an all-day in-person meeting will be held for four projects: kick-off meetings for major requirements, identifying at-risk students, and advising students and second meeting for three-year pathways to the bachelor's degree
- October 2015: UCOP update at next Governor's Office/DOF meeting
- November 2015: UCOP to convene point persons to assess campus progress and share strategies for making progress; may combine with other cross-campus project teams
- Late January 2015: Quickie meeting to gauge progress
- March 1, 2016: Campus report on progress (majors that met criteria when project started, majors that have been reviewed and changed **(goal of 30%),** majors being worked on).
- April 2016: UCOP update at next Governor's Office/DOF meeting
- July 2016: Campuses report progress on achieving goal of **60%** of majors completed.
- August 2016: Campuses work on representation and dissemination of approved changes.
- November 2016: Campus report on achieving goal of **75%** of majors completed. UCOP point persons and/or RAOs follow up with any campuses that have not met deadline.
- December 2016: UCOP update at next Governor's Office/DOF meeting
- February 2017: Campuses continue to develop materials for distribution, create campus website to disseminate content, and target advisors
- April 2017: Campus materials are complete and in use
- July 1, 2017: Review completed (75% of majors reviewed, changes approved, changes implemented in websites, advising, etc.)
- September 2017: UCOP submits final report

Appendix A – Cross-Campus Team Members

	Campus Point	Contact Info	Assistant	Contact Info
UCB	Catherine Koshland	vcue@berkeley.edu	Michele Kamentzky	Michka1@berkeley.edu
UCD	Carolyn Thomas	ccthomas@ucdavis.edu	Angelina Pasley	apasley@ucdavis.edu
UCI	Michael Dennin	mdennin@uci.edu	Roxanne Taylor	roxanne.tayor@uci.edu
UCLA	Patricia Turner	pturner@college.ucla.edu	Lisa Audish	laudish@college.ucla.edu
UCM	Elizabeth Whitt	ewhitt@ucmerced.edu	Juana Dumagan-Garcia	jdumagan@ucmerced.edu
UCR	Paul D'Anieri	paul.danieri@ucr.edu and	Victor Olivieri	victor.olivieri@ucr.edu
	Jose Wudka	jose.wudka@ucr.edu	Victor Olivieri	victor.olivieri@ucr.edu
UCSD	Barbara Sawrey	bsawrey@ucsd.edu	Gail McNabb	gmcnabb@ucsd.edu
UCSB	Carl Gutierrez-Jones	carlgj@ltsc.ucsb.edu	Cynthia Hinds	chinds@ltsc.ucsb.edu
	Jeff Stopple	stopple@math.ucsb.edu	Cynthia Hinds	chinds@ltsc.ucsb.edu
UCSC	Richard Hughey	rph@ucsc.edu	Mary Barton	mbarton@ucsc.edu

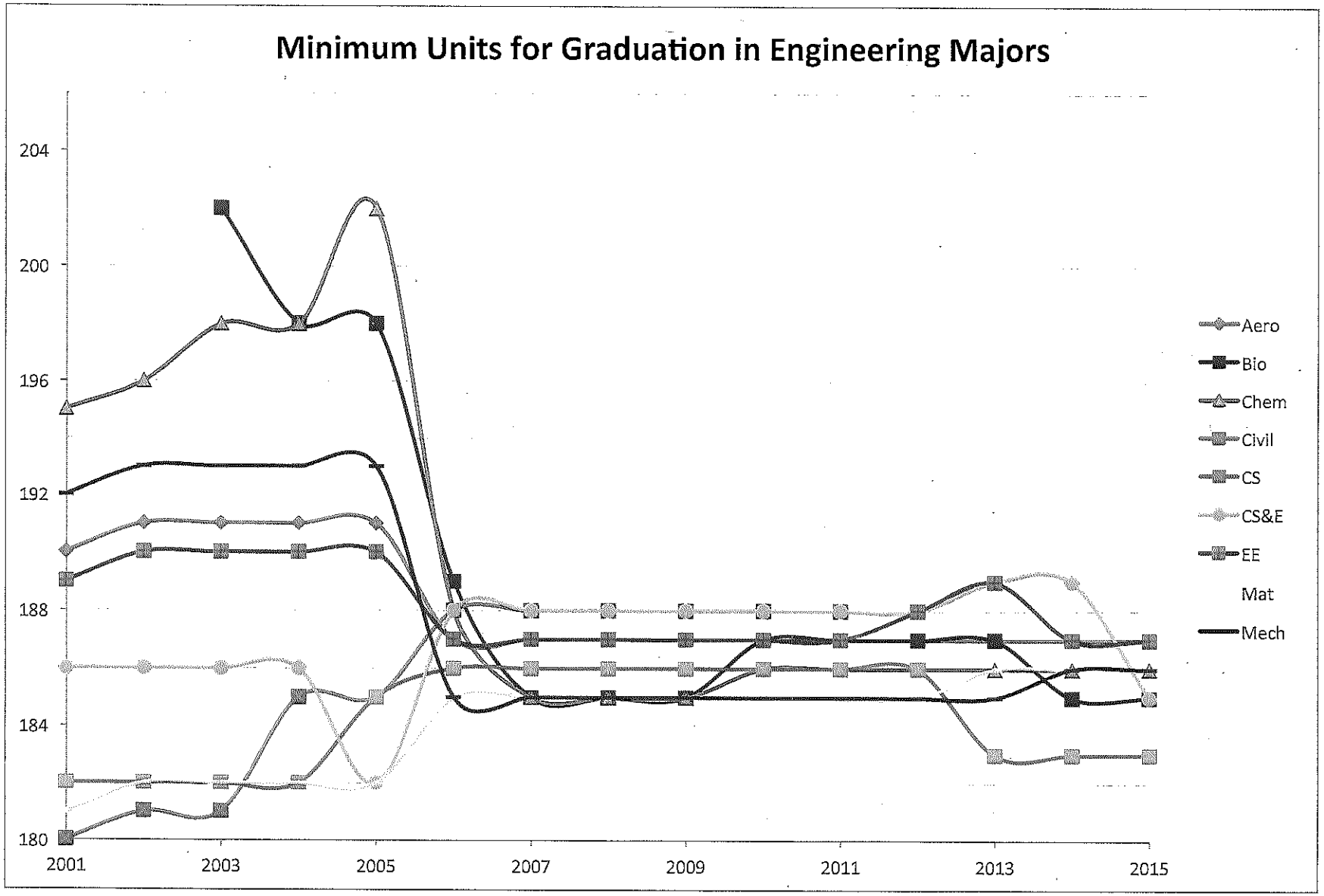
Appendix B – UCOP Contacts

Responsible and Accountable Officer	Contact Info	Assistant	Contact Info
Aimée Dorr	provost@ucop.edu	Yvonne Perrelli	yvonne.perrelli@ucop.edu
Pamela Brown	pamela.brown@ucop.edu	Arthur Barker	arthur.barker@ucop.edu
UCOP Point Person			
Aimée Dorr	provost@ucop.edu	Yvonne Perrelli	yvonne.perrelli@ucop.edu

Appendix C – Tentative Meeting (in person, telephone, or video) Schedule 2015-2016

2015	Date	Purpose
Meeting 1	Week of September 28	Kick-Off
Meeting 2	Week of November 16	Update progress/share strategies
2016		
Meeting 3	Week of January 25	Update progress/share strategies
Meeting 4	Week of March 14	Progress to first goal (30%)
Meeting 5	Week of May 16	Update progress/share strategies
Meeting 6	Week of August 15	Progress to second goal (60%)
Meeting 7	Week of October 17	Update progress/share strategies
Meeting 8	Week of November 14	Progress to final goal (75%)
2017		
Meeting 9	Week of January 16	Discussion on outreach plan
Meeting 10	Week of February 13	Progress outreach plan
Meeting 11	Week of April 17	Update on campus material development and dissemination
Meeting 12	Week of June 19	Final meeting on curriculum project

UCLA


Minimum Units for Graduation in Engineering Majors
204
200
196
192
188
184
180
2001
2003
2005
2007
2009
2011
2013
2015
Aero
Bio
Chem
Civil
CS
CS&E
EE
Mat
Mech

DEGREE PROGRAMS WITHIN THE BOURNS COLLEGE OF ENGINEERING AT UCR

	UNIT REQUIREMENTS TO EARN A BACHELOR'S OF SCIENCE DEGREE			
BS Degree Program	**Lower Division Units**	**Upper Division Units Including Technical Electives**	**Breadth Units**	**TOTAL**
Bioengineering	76	78	36	190
Business Informatics	56	93	36	185
Chemical Engineering	77	75	36	188 *
Computer Engineering	72	77	36	185
Computer Science	61	86	36	183
Electrical Engineering	73	82	36	191
Environmental Engineering	69	89	36	194
Material Science Engineering	68	76	36	180
Mechanical Engineering	73	77	36	186

NOTE:

* Total units for Chemical Engineering varies from 187 to 188 to 194 depending on the option - Nanotechnolgy, Chemical Engineering, and Biochemical Engineering respectively. The Chemical Engineering option is most common.

OFFICE OF THE PROVOST AND EXECUTIVE VICE CHANCELLOR
RIVERSIDE, CALIFORNIA 92521

Date: December 4, 2015

To: Deans, Department Chairs, Search Committee Chairs, and Affirmative Action Compliance Officers

From: Ameae Walker, Vice Provost for Academic Personnel

Cc: Paul D'Anieri, Provost and Executive Vice Chancellor
Ken Baerenklau, Associate Provost
Elizabeth Sanchez, Interim Director, Office of Faculty and Staff Affirmative Action
Academic Personnel Directors

Re: Diversity Statement Requirement for Academic Positions
Effective Date December 4, 2015

On behalf of Provost D'Anieri, I am announcing an important change to our hiring procedures that will promote greater diversity of candidates in every phase of the process. Specifically, all searches must require a Diversity Statement from all applicants rather than making these statements an optional component of the application package.

If your search is not yet published or open, please work with your recruit analyst to ensure the Diversity Statement is required in AP Recruit and that this coincides with wording in the advertisement. If your search is already published or open and the shortlist has not yet been developed, please work with your recruit analyst to send an e-mail to all applicants about this new requirement. This must be done because retroactive changes cannot be made in AP Recruit after the first applicant has applied. It is straightforward to send the same e-mail to all applicants from within AP Recruit, but you will also need to make sure you do this for additional applicants as they come in. For instructions on how to send a "bulk email" in AP Recruit, refer to pages 36-37 of the AP Recruit User Guide. Here is a template for the email notification:

> Thank you for submitting your application to [search name] at UC Riverside. Due to a recent administrative change that we were unable to program in AP Recruit (our online academic recruitment system), I am writing to notify all applicants for this search that a diversity statement must be submitted for an application to be considered complete. In AP Recruit, submission of the diversity statement is currently listed as optional. The diversity statement addresses potential contributions to academic diversity. If you have not already done so, please upload your statement before [date] to be ensured full consideration in this search.

If you have any questions about this policy change, please contact Associate Provost Ken Baerenklau at associateprovost@ucr.edu. If you have questions related to managing your search in AP Recruit, please contact your recruit analyst or the Office of Academic Personnel at aprecruit@ucr.edu.

Figures 3.2.2F illustrates the proportions of laboratory types as a result of the initial faculty survey; the subsequent recommendation of the BWG. The final recommendation of the Programming Team is in response to the BWG's request for additional fume hood capacity that could be provided over time, and the ability for the proportion of the lab types to change over time.

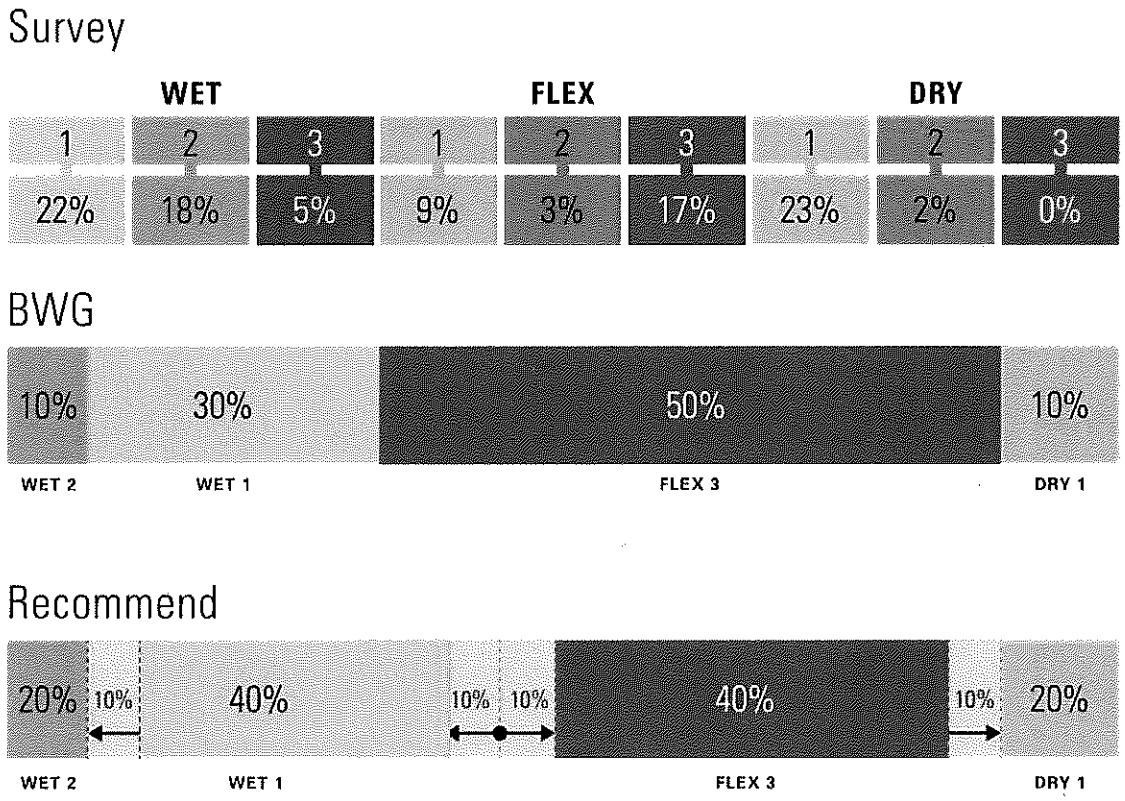


Figure 3.2.2F - Laboratory Bandwidth

3.2.3 RESEARCH LABORATORY COMPONENTS

The space program has been developed around the university's space allocation model, in which each team of wet and damp laboratory researchers will be assigned an allocation of various space types that may vary over time in accordance with need, team size and grant funding.

The initial average total allocation of laboratory and support spaces per research team is approximately 990 asf, which is slightly higher than the average allocation per team elsewhere at UCR to account for increased support space needs.