

Data provided by CCCCCO, with the following noted:

The analysis of the high unit STEM programs should be treated with care as the data has several limitations. While we have reasonable accuracy in identifying programs that recommend both Calculus and Physics, the language in the curriculum inventory does not align with the original request of degree requirements. So, if a course, such as Calculus, was one of several options for the major, the major was included in the list. As noted in the workbook, this resulted in some programs, such as business, that were clearly not STEM majors identified. Next, colleges have the option of reporting either a program control number or a program TOP code when supplying student majors. If a college provided the TOP code, it is not possible to differentiate between an ADT or local AS for a student's major.

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### **Definitions**

Using the CID for calculus I or the Calculus sequence (MATH 210, MATH 900 S), identified all course titles that were relevant to first term Calculus. Using that list, identified all programs where those courses were program applicable. Further narrowed the list of programs to those that also had program applicable coursework in physics (4 Digit TOP code = 1902). The list in the CalcPhys\_ProgAll includes ALL Programs where this methodology holds true. This does include some programs, such as Administration of Justice that are clearly not STEM courses, but others, such as Business Agriculture, where it is less clear.

## High Unit Programs

id	award	title	program_code	sub_code	reproduction_code	top_name	cip	cip_name	program_control_number	degree_units_min_to	degree_units_max_to	dw_miscode	calculus	physics	college_short_name
51941	S	Pre-Engineering	9	1	0	Engineering, General (requires Calculus) (Transfer)	140102	Pre-Engineering.	41064	74	96	31	Y	Y	IMPERIAL VALLEY
51211	X	Chemistry UCTP	19	5	0	Chemistry, General	400501	Chemistry, General.	41091	70	70	141	Y	Y	MENDOCINO
3410	S	Chemistry	19	5	0	Chemistry, General	400501	Chemistry, General.	12790	70	72	232	Y	Y	COSUMNES RIVER
3467	S	Engineering - Civil/Mechanical Option	9	1	0	Engineering, General (requires Calculus) (Transfer)	140102	Pre-Engineering.	12725	74	75	232	Y	Y	COSUMNES RIVER
49567	S	Environmental Science	3	1	0	Environmental Science	30104	Environmental Science.	39574	70	70	234	Y	Y	FOLSOM LAKE
40121	S	Engineering	9	1	0	Engineering, General (requires Calculus) (Transfer)	140101	Engineering, General.	35683	71	79	281	Y	Y	SOLANO
48434	S	Mechanical Engineering UC Pathway	9	1	0	Engineering, General (requires Calculus) (Transfer)	140102	Pre-Engineering.	38893	76	76	481	Y	Y	LAS POSITAS
51247	X	UCTP Chemistry	19	5	0	Chemistry, General	400501	Chemistry, General.	41134	70	74	493	Y	Y	WEST VALLEY
51247	X	UCTP Chemistry	19	5	0	Chemistry, General	400501	Chemistry, General.	41134	70	74	493	Y	Y	WEST VALLEY
50114	X	UCTP Chemistry	19	5	0	Chemistry, General	400501	Chemistry, General.	40009	72	72	576	Y	Y	CLOVIS
33645	S	Engineering	9	1	0	Engineering, General (requires Calculus) (Transfer)	140101	Engineering, General.	6859	78	78	681	Y	Y	MOORPARK
48001	X	UCTP Chemistry	19	5	0	Chemistry, General	999999	Unknown	39413	78	78	681	Y	Y	MOORPARK
48002	X	UCTP Physics	19	2	0	Physics, General	999999	Unknown	39414	71	71	681	Y	Y	MOORPARK
47852	S	Engineering - Civil Engineering Track	9	1	0	Engineering, General (requires Calculus) (Transfer)	140102	Pre-Engineering.	38590	84	85	746	Y	Y	L.A. TRADE-TECH
47850	S	Engineering - Electrical Track	9	1	0	Engineering, General (requires Calculus) (Transfer)	140102	Pre-Engineering.	38588	74	74	746	Y	Y	L.A. TRADE-TECH
47851	S	Engineering - Mechanical, Aerospace, Manufacturing Track	9	1	0	Engineering, General (requires Calculus) (Transfer)	140102	Pre-Engineering.	38589	80	80	746	Y	Y	L.A. TRADE-TECH
52669	S	Engineering with Emphasis in Civil Engineering Applications AS	9	24	0	Engineering Technology, General (requires Trigonometry)	150201	Civil Engineering Technologies/Technicians.	41663	70	71	851	Y	Y	MT. SAN ANTONIO
38029	S	Engineering	9	1	0	Engineering, General (requires Calculus) (Transfer)	140102	Pre-Engineering.	4768	76	79	921	Y	Y	CHAFFEY
34937	S	Environmental Science	3	1	0	Environmental Science	30104	Environmental Science.	17829	87	89	982	Y	Y	SAN BERNARDINO

## Outcomes

Row Labels	# of Students	Transfer Directed	Transfer Prepared	Year 1 to Year 2 Persistence	CSU/UC Transfer	STEM Degree	Any Degree
Astronomy	2	50.0%	0.0%	50.0%	50.0%	0.0%	0.0%
Biological and Physical Sciences (and Mathematics)	20	35.0%	30.0%	45.0%	30.0%	5.0%	20.0%
Biology, General	62	16.1%	11.3%	46.8%	58.1%	3.2%	9.7%
Biotechnology and Biomedical Technology	57	12.3%	7.0%	29.8%	45.6%	1.8%	3.5%
Chemistry for UC Transfer	14	21.4%	21.4%	35.7%	50.0%	0.0%	0.0%
Computer Information Systems	26	11.5%	7.7%	38.5%	23.1%	0.0%	3.8%
Computer Networking	1	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%
Computer Programming	13	23.1%	7.7%	53.8%	15.4%	0.0%	7.7%
Computer Science (Transfer)	19	10.5%	5.3%	68.4%	47.4%	5.3%	5.3%
Drafting Technology	4	25.0%	0.0%	25.0%	25.0%	0.0%	0.0%
Engineering Technology, General (requires Trigonometry)	4	25.0%	25.0%	75.0%	50.0%	0.0%	0.0%
Engineering, General (requires Calculus) (Transfer)	127	18.1%	15.7%	41.7%	47.2%	5.5%	9.4%
Environmental Studies	1	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%
Geology	2	0.0%	0.0%	50.0%	0.0%	0.0%	50.0%
Industrial Systems Technology and Maintenance	2	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%
Information Technology, General	91	31.9%	27.5%	44.0%	30.8%	17.6%	23.1%
Manufacturing and Industrial Technology	4	0.0%	0.0%	75.0%	50.0%	0.0%	0.0%
Mathematics, General	43	20.9%	20.9%	51.2%	37.2%	4.7%	9.3%
Nutrition, Foods, and Culinary Arts	2	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Oceanography	1	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%
Physical Sciences, General	7	14.3%	14.3%	14.3%	42.9%	0.0%	0.0%
Physics for UC Transfer	7	42.9%	42.9%	71.4%	85.7%	14.3%	28.6%
Public Health	9	22.2%	0.0%	77.8%	11.1%	0.0%	0.0%
Zoology, General	1	0.0%	0.0%	100.0%	100.0%	0.0%	0.0%
<b>Grand Total</b>	<b>519</b>	<b>20.2%</b>	<b>16.0%</b>	<b>44.7%</b>	<b>41.2%</b>	<b>6.0%</b>	<b>10.6%</b>

Using the list generated from Question 1 (tab 2) and making a professional judgement to exclude some of the questionable programs, I used the TOP codes from those programs to identify students who entered during the 2015-16 academic year. Due to how colleges report student major, we cannot use the specific program control numbers to exactly match the programs in Question 1. With those limitations, identified specific momentum points and outcomes for the students in those majors in the cohort. Transfer Directed = successful completion of transferable Math and English coursework. Transfer prepared = student has earned 60+ transferrable units and a 2.0+ GPA. Year 1 to Year 2 Persistence = Student was enrolled at a California Community College during the 2016-17 academic year. STEM Award = Student earned a degree in a STEM program. Any Award = Student earned any AA/AS degree. CSU/UC Transfer = Student transferred to a CSU or UC campus.

All STEM - Cohort 2015-16						
Programs (TOP Title)	# of Students	Transfer Directed	Transfer Prepared	Year 1 to Year 2 Persistence	STEM Degree	Any Degree
Administrative Medical Assisting	2,000	16.1%	13.85%	36.45%	3.35%	10.70%
Agriculture Business, Sales and Service	887	20.7%	19.73%	27.40%	6.88%	13.08%
Anatomy and Physiology	19	47.4%	47.37%	73.68%	5.26%	31.58%
Animal Science	1,797	27.2%	21.81%	35.23%	4.06%	11.02%
Anthropology	3,702	20.6%	15.18%	20.31%	6.08%	11.72%
Archaeology	112	9.8%	16.96%	41.07%	3.57%	9.82%
Astronomy	537	27.4%	19.55%	27.93%	3.54%	11.55%
Athletic Training and Sports Medicine	1,095	17.8%	17.08%	34.52%	2.65%	10.32%
Biology, General	59,121	34.3%	24.24%	25.95%	5.06%	12.35%
Biotechnology and Biomedical Technology	3,549	29.8%	22.51%	32.01%	4.68%	9.52%
Botany, General	85	25.9%	18.82%	43.53%	3.53%	11.76%
Cardiovascular Technician	314	19.1%	12.74%	26.11%	7.96%	13.06%
Certified Nurse Assistant	3,051	12.9%	8.52%	26.91%	1.38%	5.83%
Chemistry, General	7,407	36.3%	26.45%	30.30%	5.51%	13.14%
Clinical Medical Assisting	667	10.8%	7.95%	25.19%	3.30%	7.35%
Community Health Care Worker	270	8.1%	6.67%	38.89%	1.48%	4.81%
Computer Information Systems	9,644	24.5%	16.55%	23.96%	3.04%	7.39%
Computer Infrastructure and Support	1,203	15.8%	11.06%	19.45%	3.91%	5.90%
Computer Networking	3,781	15.0%	11.85%	22.90%	4.36%	7.43%
Computer Programming	14,057	29.9%	21.00%	29.64%	3.54%	8.41%
Computer Science (Transfer)	23,284	34.9%	23.43%	26.10%	4.10%	9.56%
Computer Software Development	1,503	24.6%	18.90%	33.53%	4.26%	9.71%
Computer Support	434	10.1%	8.76%	29.49%	3.69%	5.30%
Computer Systems Analysis	1,083	42.7%	30.93%	35.36%	8.59%	15.70%
Database Design and Administration	154	12.3%	7.14%	18.18%	0.65%	2.60%
Dental Assistant	1,950	14.6%	10.92%	29.49%	5.85%	11.28%
Dental Hygienist	3,388	15.9%	13.67%	23.14%	4.13%	9.95%
Dental Laboratory Technician	262	13.4%	11.45%	32.44%	4.20%	8.02%
Dental Occupations	12	50.0%	41.67%	33.33%	0.00%	8.33%
Dental Technician	1	0.0%	100.00%	100.00%	0.00%	100.00%
Diagnostic Medical Sonography	211	23.2%	18.01%	32.23%	2.84%	14.22%
Earth Science	145	21.4%	11.72%	34.48%	2.76%	8.97%
E-Commerce (Technology emphasis)	41	17.1%	9.76%	12.20%	0.00%	2.44%
Electrocardiography	50	6.0%	14.00%	28.00%	6.00%	8.00%
Electro-Diagnostic Technology	1	100.0%	100.00%	100.00%	0.00%	100.00%
Electro-Neurodiagnostic Technology	19	5.3%	5.26%	21.05%	5.26%	15.79%
Emergency Medical Services	4,860	7.5%	5.70%	24.30%	0.86%	4.09%
Environmental Science	1,564	26.4%	16.37%	23.59%	1.60%	7.74%
Environmental Sciences and Technologies, Other	137	31.4%	25.55%	45.26%	0.73%	16.06%
Environmental Studies	1,813	31.3%	20.30%	25.26%	3.25%	12.74%
Environmental Technology	4,765	3.2%	2.54%	15.66%	0.44%	1.30%
Geology	926	24.3%	17.82%	25.27%	3.46%	10.26%
Health	87	32.2%	26.44%	1.15%	6.90%	14.94%
Health Facility Unit Coordinator	3	33.3%	33.33%	33.33%	0.00%	33.33%
Health Information Coding	183	6.6%	3.83%	23.50%	3.83%	6.01%
Health Information Technology	1,380	6.4%	7.46%	28.26%	7.61%	9.49%
Health Occupations, General	7,131	22.0%	20.12%	43.42%	4.54%	15.34%
Health Professions, Transfer Core Curriculum	14,200	22.9%	17.90%	25.15%	5.98%	12.90%
Home Health Aide	110	11.8%	9.09%	24.55%	1.82%	5.45%
Hospital and Health Care Administration	197	13.7%	9.64%	19.80%	1.52%	5.58%
Hospital Central Service Technician	39	0.0%	0.00%	28.21%	2.56%	2.56%
Information Technology, General	4,048	27.3%	22.38%	44.07%	4.59%	11.59%
Kinesiology	19,785	24.3%	19.14%	22.92%	4.85%	11.29%
Licensed Vocational Nursing	3,226	15.7%	10.94%	29.94%	3.44%	8.56%
Massage Therapy	70	10.0%	15.71%	50.00%	1.43%	4.29%
Mathematics Skills	10	20.0%	0.00%	10.00%	0.00%	0.00%
Mathematics, General	17,705	32.6%	21.12%	28.22%	5.28%	11.22%
Medical Assisting	5,394	12.3%	9.55%	29.79%	2.48%	7.55%
Medical Laboratory Technology	936	23.0%	18.16%	31.73%	3.31%	11.43%
Medicine, General	137	43.1%	40.15%	35.77%	8.76%	14.60%
Microbiology	99	37.4%	31.31%	41.41%	8.08%	15.15%
Mortuary Science	309	12.3%	19.74%	45.63%	14.56%	19.09%
Natural History	86	12.8%	4.65%	29.07%	0.00%	1.16%
Nursing	6,066	22.4%	17.03%	27.60%	3.94%	10.65%
Nutrition, Foods, and Culinary Arts	2,633	20.7%	14.96%	20.39%	3.76%	9.99%
Occupational Therapy Technology	210	27.6%	23.33%	48.57%	4.76%	14.29%
Ocean Technology	10	20.0%	30.00%	70.00%	20.00%	30.00%
Oceanography	119	29.4%	20.17%	36.13%	5.88%	13.45%
Optical Technology	52	26.9%	28.85%	75.00%	9.62%	17.31%
Orthopedic Assistant	96	24.0%	12.50%	33.33%	4.17%	9.38%
Other Biological Sciences	277	47.3%	41.52%	56.32%	4.33%	17.33%
Other Health Occupations	707	14.9%	14.71%	36.07%	0.99%	5.80%
Other Information Technology	716	26.5%	20.25%	46.09%	2.79%	11.87%
Other Mathematics	10	60.0%	60.00%	70.00%	10.00%	30.00%
Other Physical Sciences	1	0.0%	0.00%	100.00%	0.00%	0.00%
Paramedic	3,868	8.2%	7.08%	25.03%	0.88%	4.37%
Pharmacy Technology	757	14.1%	12.02%	27.87%	4.76%	9.91%
Phlebotomy	199	5.0%	3.02%	24.62%	1.01%	1.51%
Physical Sciences, General	1,531	26.4%	21.36%	41.48%	4.31%	12.41%
Physical Therapist Assistant	1,054	17.8%	15.46%	33.78%	4.74%	11.95%
Physicians Assistant	143	18.2%	16.78%	54.55%	2.80%	11.19%
Physics, General	3,702	34.3%	22.50%	28.80%	6.43%	11.78%
Plant Science	627	17.1%	12.92%	10.37%	3.83%	7.34%
Polysomnography	2	0.0%	0.00%	50.00%	0.00%	0.00%
Psychiatric Technician	464	12.1%	15.30%	35.34%	3.02%	12.07%
Radiation Therapy Technician	34	20.6%	23.53%	50.00%	8.82%	11.76%
Radiologic Technology	4,451	17.8%	14.87%	24.60%	3.95%	10.27%
Registered Nursing	85,589	25.1%	18.24%	29.32%	3.47%	13.06%
Respiratory Care/Therapy	1,446	14.9%	10.51%	26.35%	4.29%	9.89%
Software Applications	1,693	18.4%	13.70%	27.70%	2.89%	9.16%
Speech/Language Pathology and Audiology	512	19.1%	21.48%	26.17%	6.05%	16.41%
Surgical Technician	355	12.7%	14.37%	28.17%	2.25%	9.30%
World Wide Web Administration	695	11.5%	8.35%	30.65%	1.29%	4.60%
Zoology, General	664	22.3%	21.23%	36.60%	1.51%	11.14%
<b>Grand Total</b>	<b>353,719</b>	<b>26.1%</b>	<b>18.95%</b>	<b>27.82%</b>	<b>4.14%</b>	<b>11.12%</b>