

2018 Natural Science/Mathematics Instructional Program Review

LASSEN COMMUNITY COLLEGE

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2018 Natural Science/Mathematics Instructional Program Review

SECTION 1: ACADEMIC PLANNING

I. Program Overview, Objectives, and Student Learning Outcomes

Description/Evaluation:

The Natural Science/Mathematics Program includes the following degrees:

- *University Studies Associate in Arts degree with Emphasis Allied Health,*
- *Associate in Science in Biology for Transfer,*
- *Associate in Science in Geology for Transfer,*
- *University Studies and General Studies Associate in Arts degrees with Emphasis in Natural Science.*
- *Associate in Science in Nutrition and Dietetics for Transfer*

The program includes courses meeting the requirements of

- *Area B – Scientific Inquiry and Quantitative Reasoning of the California State University (CSU) General Education Certification,*
- *Area 2 Mathematical Concepts and Quantitative Reasoning and*
- *Area 5 –Physical and Biological Sciences of the Intersegmental General Education Transfer Curriculum (IGETC) as well as*
- *Area A – Natural Science and*
- *Area D2 – Communication and Analytical Thinking of the Career Technical and General Studies associate degrees.*

Hence, the program contributes to the successful completion of either the CSU General Education Certificate of Achievement or the IGETC Certificate of Achievement.

The program has a two-fold objective to provide core curriculum necessary to meet the needs of students planning to major in one of the natural sciences at a four-year institution, while also providing a variety of options for students to meet their general education requirements for associate degrees and/or Intersegmental General Education Transfer Curriculum (IGETC) or California State University (CSU) certification.

Additionally, in order to assure continuity between basic skills, pre-collegiate, and collegiate curriculum, three credit and two non-credit basic skills mathematics courses are included as components of this program.

The adopted program level student learning outcomes for the Natural Science/Mathematics program include:

Natural Science/Mathematics Program Level Student Learning Outcomes

- 1. Demonstrate an understanding of the basic methodologies of science.*
- 2. Examine the influence that the acquisition of scientific knowledge has on the development of the world's civilizations.*
- 3. Demonstrate a basic understanding of the language, laws, theories, and processes that are fundamental to anthropology, biology chemistry, meteorology, geology, and/or physics through the observation and analysis of real life situations.*

In addition, several of the General Education Area Student Learning Outcomes (Area B – Scientific Inquiry and Quantitative Reasoning of the California State University (CSU) General Education Certification, Area 2 Mathematical Concepts and Quantitative Reasoning and Area 5 –Physical and Biological Sciences of the Intersegmental General Education Transfer Curriculum (IGETC) as well as Area A – Natural Science and Area D2 – Communication and Analytical Thinking) are included within the purview of the Natural Science/Mathematics Program.

General Education Area Student Learning Outcomes

- 1. Understand and apply methods of inquiry for a variety of disciplines including the scientific method for scientific inquiry and appropriate methods for social and behavior science inquiries. Note: blends Title V expectations in Natural Science and Social and Behavioral Sciences, yet has in common that there are methods of inquiry unique to different disciplines.*
- 2. Explain and analyze relationships between science and other human activities.*
- 3. Engage in verbal communication by participating in discussions, debates, and oral presentations utilizing proper rhetorical perspective, reasoning and advocacy, organization, accuracy, and the discovery, critical evaluation and reporting of information.*
- 4. Compose effective written communications and essays with correct grammar, spelling, punctuation and appropriate language, style and format utilizing academically accepted means of researching, evaluating and documenting sources within written works.*
- 5. Analyze, evaluate and explain theories, concepts and skills within varied disciplines using inductive and deductive processes and quantitative reasoning and application.*

The various program degrees, certificates, general education and basic skills curricula all contribute to students successfully completing their educational objectives and hence the achievement of the adopted student learning outcomes for their courses, degrees or certificates. The associations between course and program/institutional student learning outcomes for the

Natural Science/Mathematics Program have been established and entered into “qlik” the online application utilized by the college for tracking student learning outcome assessment and integrating those outcomes into institutional planning.

In addition to the institutional student learning outcomes, the program is tied to the other two major components of the institutional strategic plan, the adopted mission statement and strategic goals. Specifically, the program addresses the components of the mission statement dealing with transfer degrees and certificate programs in addition to providing basic skills instruction in mathematics.

The Natural Science/Mathematics program’s primary focus is on two of the institutional strategic goals: Learning Opportunities and Student Success.

Natural Science

1. Communication

All natural science classes are degree applicable transfer level courses requiring reading and writing skills at a college level. Classes have required textbooks, which challenge students to comprehend complex concepts through their reading skills. Lectures explaining these same complex concepts require students to hone their listening skills. Each course requires students to communicate in writing either through combination of essay responses on exams, laboratory journals, or research papers.

2. Critical Thinking

Scientific inquiry is, by its very nature, an exercise in critical thinking. Science encourages the analysis of data in order to reach an informed decision. In addition, the critical thinking skills acquired in science classes is applicable in many areas of daily life.

3. Life Long Learning

Each natural science course promotes an awareness and appreciation of the world in which we live. Individuals are encouraged to question and explore the world around them.

4. Personal/Interpersonal Responsibility

The majority of science courses contain a laboratory component, which promotes collaborative interactions in the completion of assignments. The timely completion of the laboratory and field trip reports encourages development of personal responsibility.

Mathematics

1. Communication

Mathematics courses require individuals to practice the ability to listen and read critically with comprehension.

2. Critical Thinking

Mathematics encourages a systematic approach to the identification, analysis and solution of problems.

3. Life Long Learning

Every mathematics course includes real-world application problems, ensuring each course relates to aspects of everyday life. As future workplaces require more technical skills, the use of technology in teaching mathematics becomes more prevalent and important.

4. Personal/Interpersonal Responsibility

As in other college level courses, mathematics courses enhance the acceptance of personal responsibility for an individual's success or failure.

Planning Agenda:

None

II Student Outcomes

A. Trends and Patterns in Student Outcomes

Description/Evaluation:

Table I

Degrees and Certificates Awarded

	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/2018
<i>Total AA/AS degrees</i>	132	152	190	202	200	239	252	
<i>AS –T Biology Approved 2015</i>	0	0	0	0	0	1	0	
<i>AS US- Biology Inactivate 2015</i>	0	0	2	1	1	1	0	
<i>AS US Math/PS Inactivate 2015</i>	1	3	3	4	3	3	2	
<i>AA US Allied Health Approved 2008</i>	5	1	3	2	4	7	4	1
<i>AA GS Natural Science Approved 2008</i>	2	4	3	1	4	5	3	
<i>AA US Natural Science Approved 2008</i>	3	3	9	9	9	7	9	

<i>AS in Nutrition and Dietetics for transfer</i> <i>Approved 2016</i>	0	0	0	0	0	0	0	1
<i>AS in Geology for transfer</i> <i>Approved 2013</i>	NA	NA	0	0	0	0	0	0
<i>CSU /IGETC</i> <i>Certification</i>	43	54	50	52	56	62	74	

The Office of Institutional Effectiveness entered data into the online data resource “qlik” during the 2016-2017 academic year. The data provided in this program review is derived from that online resource.

Table II
Retention and Success Data by Discipline 2013-2017

<i>Discipline</i>	<i>2013/14</i>		<i>2014/15</i>		<i>2015/16</i>		<i>2016/17</i>	
	<i>Retention</i>	<i>Success</i>	<i>Retention</i>	<i>Success</i>	<i>Retention</i>	<i>Success</i>	<i>Retention</i>	<i>Success</i>
<i>Anthropology</i>	85%	66%	83%	60%	80%	54%	83%	64%
<i>Biological Science</i>	80%	56%	80%	52%	89%	70%	87%	60%
<i>Chemistry</i>	81%	65%	92%	53%	93%	76%	100%	81%
<i>Geology</i>	91%	79%	100%	95%	98%	89%	90%	86%
<i>Mathematics</i>	80%	48%	84%	49%	83%	48%	85%	52%
<i>Physical Science</i>	77%	65%	88%	74%	89%	76%	86%	64%
<i>Physics</i>	-	-	100%	93%	-	-	89%	63%
<i>Total</i>	81%	53%	84%	54%	85%	55%	85%	57%

Table III

Retention and Success Data by Mode of Delivery 2015-2017

Discipline	Face to Face 2015-2016		Correspondence 2015-2016		Internet 2015-2016		Face to Face 2016-2017		Correspondence 2016-2017		Internet 2016-2017	
	Retention	Success	Retention	Success	Retention	Success	Retention	Success	Retention	Success	Retention	Success
<i>Anthro 1</i>	95%	65%	78%	49%	81%	62%	NA	NA	86%	62%	76%	68%
<i>Math 102</i>	74%	40%	79%	37%	91%	37%	63%	37%	84%	52%	79%	46%
<i>Math 103</i>	75%	37%	83%	49%	92%	61%	90%	39%	80%	64%	98%	61%
<i>Math 40</i>	89%	71%	NA	NA	88%	44%	84%	65%	NA	NA	84%	49%
<i>Math 60</i>	79%	39%	88%	48%	91%	67%	76%	24%	85%	45%	96%	81%
<i>PHSC 1</i>	NA	NA	NA	NA	89%	76%	NA	NA	NA	NA	86%	64%

The retention rates amongst the natural science disciplines vary greatly with chemistry, physics, and geology the highest and anthropology the lowest. The overall average tends to fall in the 80th percentile. The success rates also vary between the disciplines with the greatest success rate in geology and the lowest in mathematics.

The success rates of the basic skills mathematics courses are consistently below seventy percent irrespective of the mode of delivery with the marked exception of Math 60 delivered online during the last year.

During the previous two program reviews faculty identified that lack of consistent attendance in mathematics and science courses are contributing to the lack of success for many students. The poor attendance by many students has not improved over the last four years. The study to assess the relationship between poor attendance and lack of success and identify factors contributing to poor attendance did not occur.

Planning Agenda:

- 1. Assess the relationship between poor attendance and lack of success in mathematics and science courses and identify the primary factor contributing to poor attendance.*
- 2. Pilot a project to improve attendance in mathematics and science courses and assess impact on success rates.*
- 3. Implement “Pathways through Algebra Project” intervention to increase student success.*

4. *Pilot projects in Gatekeeper courses, incorporating active learning strategies, learning communities, student-peer mentoring and writing across the curriculum to increase student success.*
5. *Encourage students to fully utilize the Math Lab, NETTUTOR, Learning Center and Peer Tutors and expand peer tutoring into summer session when mathematics courses are taught.*

B. Student Learning Outcome Assessment

Description/Evaluation:

All of the degree, certificates and courses within the Natural Science/Mathematics Instructional Program have approved student-learning outcomes.

The Natural Science/Mathematics program has on-going student learning outcome assessment at both the course level and program level. The initial program level assessment occurred during the 2012-2013 academic year. “Qlik” compiles program-level assessment once course-level assessment data is entered. Mathematics student learning outcome assessment results were reported in 2015, but did not appear in the spreadsheet provided to the program. Assessment data for 100% of courses in the program was reported for fall 2017.

Table IV

Program Student Learning Outcome Assessments 2015-2016

<i>Degree/Certificate</i>	<i>Target</i>	<i>Finding</i>
<i>Allied Health AA US</i>	<i>75% on all core course SLOs</i>	<i>79% on all core course SLOs</i>
<i>Biology AS-T</i>	<i>75% on all core course SLOs</i>	<i>Data combined with Allied Health</i>
<i>Geology AS-T</i>	<i>75% on all core course SLOs</i>	<i>No students currently enrolled in program</i>
<i>Natural Science AS US</i>	<i>75% on all core course SLOs</i>	<i>72% on all course SLOs</i>

Table V

SLO Attainment by Discipline 2013-2017

<i>Discipline</i>	<i>2013/14</i>	<i>2014/15</i>	<i>2015/16</i>	<i>2016/17</i>
<i>Anthropology</i>	69%	86%	84%	70%
<i>Biological Science</i>	75%	76%	71%	82%
<i>Chemistry</i>	79%	83%	No results	81%
<i>Geology</i>	87%	94%	79%	84%
<i>Mathematics</i>	69%	70%	77%	68%
<i>Physical Science</i>	85%	83%	78%	80%
<i>Physics</i>	Not offered	No results	Not offered	No results
<i>Total</i>	70%	73%	77%	72%

Action plans generated by student learning outcome assessments focused primarily on the modification of instructional methodology. Examples include:

Spring 2016, the change of the existing histology notebook to a more comprehensive anatomy study notebook in Human Anatomy and Physiology (Bio 25/26) was proposed. Assessment during subsequent semester following the implementation of the change indicated improved student learning.

Fall 2017 – A Math Lab was offered to help students taking correspondence courses at High Desert State Prison (HDSP), but it started toward the end of that semester. So the impact was minimal.

Spring 2018 - A hybrid Math 60 course is being taught at HDSP. Part of the course is face-to-face. From all indications, students are doing very well.

Spring 2018 –For classes offered at HDSP, attempts are being made to contact students who fell behind or who missed exams. Offering chances to make up missed exams and assignments seems to be helping.

Even though the assessments were conducted on courses delivered through three different modalities: traditional classroom instruction, online delivery and correspondence delivery, the consistent theme identified was a faculty perceived correlation between attendance/participation and success. Specifically, mathematics faculty have proposed the need for a research project to provide data with respect to this perception.

Planning Agenda:

Track the effect of implemented recommendations in subsequent student learning outcome assessments in order to better determine their effectiveness.

C. Student Evaluation Summary

Description/Evaluation:

During spring 2018, 223 student evaluations were collected for fifteen classes. *Instructional Program Review - Student Evaluations [Appendix E]* contains the student evaluation summaries for five Biological Science classes: *Bio 1 – Principles of Molecular and Cellular Biology* (1 respondent), *Bio 4 – Principles of Evolutionary, Organismal, and Ecological Biology* (2 respondents), *Bio 20 – Microbiology* (5 respondents), *Bio 26 – Human Anatomy & Physiology II* (26 respondents), *Bio 32L – General Biology with Laboratory* (18 respondents); four Chemistry classes: *Chem 1B – General Chemistry II* (9 respondents), *Chem 8 – Introduction to Organic and Biochemistry* (3 respondents), *Chem 45 – Introduction to Inorganic Chemistry* (12 respondents), *Chem 55 – Introductory Chemistry* (8 respondents); six Mathematics classes: *Math 1B – Analytic Geometry and Calculus II* (3 respondents), *Math 8 – Advanced Algebra* (7 respondents), *Math 40 - Elementary Statistics* (27 respondents), *Math 60 -Intermediate Algebra* (42 respondents), *Math 102 – Pre-algebra* (10 respondents) and *Math 103 -Elementary Algebra* (44 respondents) and one Physics class: *Phys 2B- General Physics II* (1 respondent). One student did complete the survey from *Math 155- Math Lab - Basic Mathematics*. The information was not included here since the students were also enrolled in one of the other mathematics classes.

For the overall program 71.95% of the student indicated plans to transfer to a 4-year institution, 58.82% of students hope to earn an associate degree and 12.67% of student expect to receive general education certification (California State University or Intersegmental General Education Transfer Certification). Data for the overall program and data for the classes with high numbers of respondents are included in the tables below. Comments from students are included at the end of this document in Appendix E.

Table VI

Student’s Educational Goal

Course	Transfer Four-year	Transfer CC	AA/AS	GE Certification	Job Requirement	Continuing Education	Personal Development
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<i>Biol 26</i>	53.85%	6.69%	50%	7.69%	15.38%	19.23%	6.69%
<i>Math 103</i>	50%	6.82%	56.83%	6.82%	9.09%	13.64%	9.09%
<i>Math 60</i>	73.81%	0%	66.67%	7.14%	16.67%	33.33%	14.29%
<i>Math 40</i>	81.48%	7.41%	81.48%	11.11%	0%	11.11%	7.41%
<i>Overall Program</i>	71.95%	3.62%	58.82%	9.05%	8.60%	17.65%	9.50%

Table VII

Student's Reason for Taking Course

<i>Course</i>	<i>Core Requirement</i>	<i>Degree Elective</i>	<i>General Education</i>	<i>Job Requirement</i>	<i>Continuing Education</i>	<i>Personal Development</i>
<i>Biol 26</i>	81.48%	3.7%	18.52%	14.81%	11.11%	14.81%
<i>Math 103</i>	63.64%	2.27%	43.18%	9.09%	6.82%	6.82%
<i>Math 60</i>	64.29%	0%	42.86%	4.76%	11.90%	11.90%
<i>Math 40</i>	55.56%	7.41%	48.15%	0%	7.41%	7.41%
<i>Overall Program</i>	65.32%	4.50%	36.94%	5.41%	8.56%	8.11%

Table VIII

General Questions

<i>Course</i>	<i>Catalog/Schedule Description Accurate</i>	<i>Scheduling Order Explained</i>	<i>Cost beyond Books Explained</i>	<i>Was textbook adequately used</i>	<i>Was textbook useful</i>
<i>Biol 26</i>	100%	96.3%	81.48%	88.89%	88.46%
<i>Math 103</i>	95.35%	93.02%	62.79%	95.45%	93.18%
<i>Math 60</i>	100%	100%	66.67%	90.48%	90.48%
<i>Math 40</i>	100%	96.3%	70.37%	92.59%	100%
<i>Overall Program</i>	98.18%	94.55%	66.67%	91.44%	92.31%

Table IX

Scheduling Times

<i>Course</i>	<i>Current schedule met needs</i>	<i>Needed mornings</i>	<i>Needed afternoon</i>	<i>Needed evening</i>	<i>Needed summer</i>	<i>Needed week-ends</i>	<i>Needed shorter session</i>
<i>Biol 26</i>	85.19%	3.7%	3.7%	0%	11.11%	3.7%	11.11%
<i>Math 103</i>	79.55%	4.55%	13.64%	0%	2.27%	0%	2.27%
<i>Math 60</i>	90.48%	0%	0%	4.76%	2.38%	0%	2.38%
<i>Math 40</i>	88.89%	3.7%	0%	0%	3.7%	0%	0%
<i>Overall Program</i>	88.18%	2.73%	4.09%	1.36%	4.09%	0.91%	2.27%

Table X

Facilities

<i>Course</i>	<i>Access to Facilities Provided</i>	<i>Temperature was comfortable</i>	<i>Lighting was adequate</i>	<i>Furniture was adequate</i>	<i>Enough Space to Work</i>
<i>Biol 26</i>	100%	20.83% (75% too cold)	87.5%	64%	91.67%
<i>Math 103</i>	100%	78.05% (14.63% too cold)	87.80%	90%	93.75%
<i>Math 60</i>	100%	45.95% (10.81% too cold)	55.26%	63.89%	33.33% (66.67% NA)
<i>Math 40</i>	96.30%	73.91% (21.78% NA)	73.91%	73.91%	78.26%
<i>Overall Program</i>	97.67%	62.00% (15.00% NA)	78.61% (13.43% NA)	71.14% (16.42% no)	82.56% (16.28% NA)

- NA Responses may be from online students

Table XI

Equipment

<i>Course</i>	<i>Sufficient equipment</i>	<i>Sufficient time on equipment provided</i>	<i>Equipment up-to-date</i>	<i>Equipment in good operating order</i>
<i>Biol 26</i>	100%	100%	88%	100%

<i>Math 103</i>	64.23% (33.33% NA)	70.59% (26.47% NA)	61.76% (35.29% NA)	67.65% (29.41% NA)
<i>Math 60</i>	68.29% (29.27% NA)	63.16% (36.84% NA)	48.72% (43.59% NA)	51.28% (43.59% NA)
<i>Math 40</i>	NA	NA	NA	NA
<i>Overall Program</i>	71.23% (26.42% NA)	75% (24.48% NA)	59.59% (29.53% NA)	67.36% (30.05% NA)

* NA Responses may be from online students

Students consistently expressed satisfaction with:

1. *scheduling of mathematics and natural science classes*
2. *availability of facilities and equipment*
3. *temperature control in the center of the building (MS-121 & 122)*

Students expressed concerns with:

1. *chairs in several rooms are either uncomfortable or squeaky*
2. *catalog description not adequately preparing students for the cost of the program beyond the cost of textbooks*
3. *the biology end of the building specifically MS-125 was identified as being too cold*

The majority of students enrolling in natural science and mathematics courses indicate the intention to transfer to a four-year institution and earn an associate degree. Many of these students do not indicate the intention of obtaining general education certification.

Planning Agenda:

1. *Promote general education certification in preparation for transfer to a four-year institution*
2. *Complete the replacement of the chairs in the various laboratory classrooms initiated in 2016.*
3. *Replace the chairs and repair some of the large tables in the two lecture rooms (MS-121- & MS-122)*
4. *Identify program/course costs not currently cited in the catalog and modify the catalog language to more accurately reflect true costs.*

III. Curriculum

A. Degrees and/or Certificates

Description/Evaluation:

Associate in Arts Degree University Studies– Emphasis in Allied Health

Associate in Science Degree in Biology for Transfer

Associate in Science Degree in Geology for Transfer

Associate in Arts Degree General Studies – Emphasis in Natural Science

Associate in Arts Degree University Studies – Emphasis in Natural Science

Associate in Science Degree in Nutrition and Dietetics for Transfer

California State University General Education Certificate of Achievement

Intersegmental General Education Transfer Curriculum Certificate of Achievement

See Appendix “C” for requirements for specific degrees and certificates

See Appendix “D” for natural science/mathematics scheduling plan

The current curriculum provides multiple options in both life and physical science with and without a laboratory for completing Area B – Scientific Inquiry and Quantitative Reasoning of the California State University (CSU) General Education Certification, Area 5 –Physical and Biological Sciences of the Intersegmental General Education Transfer Curriculum (IGETC), and Area A – Natural Science for the non-transfer associate degree.

Life Science without a laboratory: Anthr 1, Biol 32

Life Science with a laboratory: Biol 1, Biol 4, Biol 10, Biol 20, Biol 25, Biol 26, Bio 32L

Physical Science without a laboratory: Chem 55, Geog 1, PHSC 1

Physical Science with a laboratory: Astr 1, Chem 45, Chem 1A, Chem 1B, Chem 8,

Geol 1, Geol 5, Phys 2A, Phys 2B

In addition, a variety of courses in mathematics are provided to meet Area B – Scientific Inquiry and Quantitative Reasoning of the California State University (CSU) General Education Certification, Area 2 – Mathematical Concepts and Quantitative Reasoning of the Intersegmental General Education Transfer Curriculum (IGETC), and Area D Language and Rationality for the non-transfer associate degree.

Area B – Scientific Inquiry and Quantitative Reasoning of the California State University (CSU) General Education Certification – Mathematics 1A, 1B, 1C, 7, 8, 11A, 11B, and 40

Area 2 – Mathematical Concepts and Quantitative Reasoning of the Intersegmental General Education Transfer Curriculum (IGETC) – Mathematics 1A, 1B, 1C, 8, 40

Area D Language and Rationality for the non-transfer associate degree – Mathematics 1A, 1B, 1C, 7, 8, 11A, 11B, 40, and 60

All courses have been reviewed against and found consistent with the expectations for general education courses at four-year universities.

Area B - Physical Universe and Its Life Forms

Instruction approved for the fulfillment of this requirement is intended to impart knowledge of the facts and principles, which form the foundations of living and non-living systems. Such studies should promote understanding and appreciation of the methodologies of science as investigative tools, the limitations of scientific endeavors; namely, what is the evidence and how was it derived? In addition, particular attention should be given to the influence which the acquisition of scientific knowledge has had on the development of the world's civilizations, not only as expressed in the past but also in present times. In specifying inquiry into mathematical concepts and quantitative reasoning and their application, the intention is not to imply merely basic computational skills, but to encourage as well as the understanding of basic mathematical concepts.

The current curriculum provides core lower division courses for majors in allied health, anthropology, biological science, natural science, and geology. The lower division core offerings in mathematics are limited. The college has been unable to offer Math 1C - Analytical Geometry and Calculus III, Math 11A - Concepts of Elementary School Mathematics I or Math 11B - Concepts of Elementary School Mathematics II for a number of years due to insufficient enrollment and lack of availability of instructors.

Lassen Community College currently offers three transfer degrees (Associate in Science in Biology for Transfer, Associate in Science in Geology for Transfer, and Associate in Science in Nutrition and Dietetics for Transfer), each prepares a student to transfer to a California State University and enter as a junior. The most recent, Associate in Science in Nutrition and Dietetics for Transfer, approved in Fall 2016 was awarded for the first time Spring 2017. As the transfer Model Curriculum for chemistry is developed an associate in science degree for transfer will be developed next year after addition Organic Chemistry II and II classes to the curriculum. As additional transfer Model Curriculum are developed further associate degrees for transfer within the Natural Science area will be developed as appropriate.

Planning Agenda:

Develop transfer degrees (SB 1440) in life and physical sciences (specifically Chemistry) as the Transfer Model Curriculum (TMC) become available.

B. Courses

Description/Evaluation:

A new Introductory Chemistry course was added to the program in Spring 2017 to meet the needs of many underprepared students. The new chemistry course is recommended preparation for students entering the existing Introduction to Inorganic Chemistry (Chem 45) or General Chemistry (Chem 1A) courses. As new Common Course Identification System (CI-D) descriptors are adopted science and mathematics courses are compared and considered for revisions.

The implementation of the accelerated mathematics has resulted in Math 101- Basic Mathematic no longer being offered except for incarcerated students via correspondence classes.

The course outlines for the natural science/mathematics program were reviewed as part of the instructional program review process during Spring 2018 as indicated on the Natural Science/Mathematics Instructional Program Review: Status of Curriculum Review form [Appendix B]. All the courses in the Natural Science/Mathematics program have either recommended preparation or prerequisites. The documented content reviews for the recommended preparation and prerequisites have all been completed and accepted by the Curriculum/Academic Standards Committee. In addition, all courses in the Natural Science/Mathematics program have approved course level student learning outcomes. All courses have updated representative textbooks identified on the course outlines of record.

Table XII

Program Courses

Courses				
TOP Code	Course Number	Title	Units	Lecture/Lab Hours
2202	Anthr 1	Biological Anthropology	3	3 lec
1911	Astr 1	Introduction to Astronomy	4	3 lec/3 lab
0401	Bio 1	Principles of Molecular and Cellular Biology	4	3 lec/3 lab

0401	Bio 4	<i>Principles of Evolutionary, Organismal, and Ecological Biology</i>	5	3 lec/6 lab
0401	Bio 10	<i>Natural History of Plants & Animals</i>	4	3 lec/3 lab
0403	Bio 20	<i>Microbiology</i>	5	3 lec/6 lab
0410	Bio 25	<i>Human Anatomy & Physiology I</i>	4	3 lec/3 lab
0410	Bio 26	<i>Human Anatomy & Physiology II</i>	4	3 lec/3 lab
0401	Bio 32	<i>General Biology</i>	3	3 lec
0401	Bio 32L	<i>General Biology with Laboratory</i>	4	3 lec/3 lab
1905	Chem 1A	<i>General Chemistry</i>	5	3 lec/6 lab
1905	Chem 1B	<i>General Chemistry</i>	5	3 lec/6 lab
1905	Chem 8	<i>Introduction to Organic and Biochemistry</i>	4	3 lec/3 lab
1905	Chem 45	<i>Introduction to Inorganic Chemistry</i>	4	3 lec/3 lab
1905	Chem 55	<i>Introductory Chemistry</i>	3	3 lec
2206	Geog 1	<i>Physical Geography</i>	3	3 lec
1914	Geol 1	<i>Physical Geology</i>	4	3 lec/3 lab
1914	Geol 5	<i>Historical Geology and Paleontology</i>	4	3 lec/3 lab

1700	<i>Math 1A</i>	<i>Analytical Geometry and Calculus I</i>	5	5 lec
1700	<i>Math 1B</i>	<i>Analytical Geometry and Calculus II</i>	5	5 lec
1700	<i>Math 1C</i>	<i>Analytical Geometry and Calculus III</i>	5	5 lec
1700	<i>Math 7</i>	<i>Trigonometry</i>	3	3 lec
1700	<i>Math 8</i>	<i>Advanced Algebra</i>	3	3 lec
1700	<i>Math 11A</i>	<i>Concepts of Elementary School Mathematics I</i>	3	3 lec
1700	<i>Math 11B</i>	<i>Concepts of Elementary School Mathematics II</i>	3	3 lec
1700	<i>Math 40</i>	<i>Elementary Statistics</i>	3	3 lec
1700	<i>Math 60</i>	<i>Intermediate Algebra</i>	4	3 lec/3 lab
1700	<i>Math 101</i>	<i>Basic Mathematics</i>	2	1 lec/3 lab
1700	<i>Math 102</i>	<i>Pre-algebra</i>	2	1 lec/3 lab
1700	<i>Math 103</i>	<i>Elementary Algebra</i>	4	3 lec/3 lab
4930.62	<i>Math 155</i>	<i>Math Lab Basic Skills</i>	0	
4930.62	<i>Math 156</i>	<i>Math Lab – Pre-collegiate Algebra</i>	0	
1901	<i>PHSC 1</i>	<i>General Physical Science</i>	3	3 lec
1902	<i>Phys 2A</i>	<i>General Physics</i>	4	3 lec/3 lab
1902	<i>Phys 2B</i>	<i>General Physics</i>	4	3 lec/3 lab

Planning Agenda:

Align core courses within the mathematics/natural science program with the C-ID descriptors as they become available for comparison and submit for C-ID approval.

C. Articulation/Integration of Curriculum

Description/Evaluation:

The implementation of the C-ID system has shifted the focus for courses with approved C-ID descriptors to obtaining C-ID approval for those courses. Articulation agreements remain in place for all of the degree applicable courses within the Mathematics/Natural Science program.

Articulation agreements are maintained through the efforts of the Transfer Center under the direction of the Articulation Officer. The Articulation Officer works with individual instructors and receiving institutions to resolve articulation issues. All transfer level natural science and mathematics courses, which are listed as satisfying the general education requirement of the CSU and UC systems, articulate with those institutions. The Articulation Office updates the agreements annually.

Planning Agenda:

Submit core courses within the mathematics/natural science program for C-ID approval as the C-ID descriptors become available for comparison.

III. Scheduling and Enrollment Patterns

Description/Evaluation:

The Natural Science/Mathematics Program Two-Year Plan [Appendix C] and Natural Science/Mathematics Program Schedules [Appendix D] are provided as attachments. Every effort has been made over the last two years to adhere to the established two-year plan. The administration has been supportive by retaining low enrollment classes in order to assure that students have the opportunity to complete their objectives in a timely fashion. During the 2014-2015 academic year the program returned to offering the two-semester Physics sequence alternating years. Enrollments in the advance science courses: biology, chemistry and physics have continued consistently low despite offering courses once a year or even every other year.

Efforts are made to provide students with a variety of scheduling options specifically when it comes to general education courses. Whenever possible morning evening and afternoon section are provided. Enrollments in evening classes are generally lower than morning classes with afternoon classes generally showing lower enrollments than evening courses. As a consequence, morning classes tend to be scheduled first resulting in conflicts and competition for classrooms.

Mathematics, specifically basic skills mathematics generates the greatest FTEs, although FTEs from mathematics have significantly decreased over the last two academic years. The FTEs in biology have significantly increased during the last two academic years with the hiring of a second full-time biology instructor.

Table XIII

Average Class Size by Discipline and Mode of Delivery

<i>Instructional Area</i>	<i>2015/16 On campus</i>	<i>2015/16 Correspondence</i>	<i>2015/16 Internet</i>	<i>2016/17 On campus</i>	<i>2016/17 Correspondence</i>	<i>2016/17 Internet</i>	<i>Avg</i>
<i>Anthropology</i>	<i>21 (1)</i>	<i>27.2 (5)</i>	<i>24.3 (3)</i>	<i>19.0 (1)</i>	<i>25.4 (5)</i>	<i>18.0 (3)</i>	<i>23.9</i>
<i>Biological Science</i>	<i>17.3 (15)</i>	<i>-</i>	<i>-</i>	<i>16.3 (14)</i>	<i>-</i>	<i>-</i>	<i>16.8</i>
<i>Chemistry</i>	<i>16.6 (5)</i>	<i>-</i>	<i>-</i>	<i>9.0 (6)</i>	<i>-</i>	<i>-</i>	<i>12.5</i>
<i>Geology</i>	<i>23.5 (2)</i>	<i>-</i>	<i>-</i>	<i>24.0(2)</i>	<i>-</i>	<i>-</i>	<i>23.8</i>
<i>Mathematics</i>	<i>11.7 (37)</i>	<i>18.5 (19)</i>	<i>25.3 (11)</i>	<i>19.2(28)</i>	<i>19.8 (10)</i>	<i>27.5 (13)</i>	<i>19.9</i>
<i>Physical Science</i>	<i>-</i>	<i>-</i>	<i>25.3 (3)</i>	<i>-</i>	<i>-</i>	<i>29.7 (3)</i>	<i>27.5</i>
<i>Physics</i>	<i>-</i>	<i>-</i>	<i>-</i>	<i>14.0 (2)</i>	<i>-</i>	<i>-</i>	<i>14.0</i>

(number of sections)

Anthropology and Mathematics are the only disciplines offered in all three modalities of delivery (on-campus, inmate correspondence and online). In both cases, on-campus traditional instruction classes exhibited the lowest average enrollments, while correspondence for Anthropology and online for Mathematics exhibited the highest average enrollments. The average class size for the program as a whole is twenty (20).

Table XIV

FTE by Subject Area and Academic Year

<i>Subject Area</i>	<i>FTEs 12-13</i>	<i>FTE's 13-14</i>	<i>FTE's 14-15</i>	<i>FTE's 15-16</i>	<i>FTE's 16-17</i>

<i>Anthropology</i>	23	21	24	23	20
<i>Biology</i>	37	69	61	81	83
<i>Chemistry</i>	15	18	15	20	11
<i>Geology</i>	11	11	11	9	10
<i>Mathematics</i>	246	242	228	178	183
<i>Physical Science</i>	5	8	8	8	9
<i>Physics</i>	2	-	3	-	6
<i>Total Natural Science Program</i>	336	333	314	282	285

Transfer collegiate level courses generated the lowest full-time equivalents, while basic skills mathematics courses generated the highest full-time equivalents. The absence of a full-time instructor in Biology during the 2012-2013 academic year resulted in a marked reduction in full-time equivalents generated by that discipline. The addition of second full-time biology instructor in the 2016-217 academic year resulted in an increase in FTE's of about thirty percent. The increase was not higher because of the significant overload taught by the single full-time instructor during the previous years, which did not occur following the hiring of the second instructor. All disciplines delivering classes exclusively through traditional instruction (no correspondence or online delivery) generated fewer FTE's than disciplines utilizing multiple modalities.

The natural science/mathematics two-year plan is a combination of the previously developed two-year plans for mathematics, biological science and physical science. The integration of the three areas into a single two-year plan allows for reduction in the number of scheduling conflicts. The schedule includes traditional on-campus offerings in addition to distance education via online and correspondence delivery for selected courses in mathematics and physical anthropology.

Physical Anthropology has not been taught during the day for a number of years. This life science without a laboratory could be a beneficial addition to the day program if an instructor could be found.

Biol 4 – Principles of Evolutionary, Organismal, and Ecological Biology, which replace the Principles of Botany and Principles of Zoology courses was offered each of the last four springs with extremely low enrollments. Consider moving the class in the two-year plan to being offered only odd springs.

The scheduling of the one-year Physics sequence alternate years has not resolved the low enrollment, but the courses are extremely important to students majoring in biological and several physical sciences.

The offering of the inorganic chemistry (Chem 1A & 1B) each year was returned to the two-year plan in fall 2011. Enrollments in the second semester are low but the courses are necessary to meet the educational needs of a number of majors.

The scheduling of basic skills mathematics course (Math 102) and algebra courses (Math 103 and Math 60) at the same time to allow students to make schedule adjustment during the semester seems to be serving the students well. The greater effort to assure that the basic skills mathematics courses do not conflict with basic skills English classes has also improved access for students. The implementation of the accelerated mathematics has resulted in Math 101 no longer being offered except for incarcerated students via correspondence classes.

The enrollments in Math 1A - Analytical Geometry and Calculus I and sequentially Math 1B - Analytical Geometry and Calculus II have historically been low. The college has been unable to schedule Math 1C - Analytical Geometry and Calculus III due to insufficient enrollment. The offering of the calculus sequence is essential in order to continue to attract students interested in majoring in mathematics or one of the natural sciences.

For the first time Spring 2016, the Math labs (Math 155 and Math 156) were scheduled in the Math-Science building. The attendance of students to the Math Lab has not been as high as initially anticipated. With the implementation of AB 705, Math Lab availability to students will be very important.

Planning Agenda:

Schedule traditionally low enrollment core courses (Biol 4, Chem 1A, Chem 1B, Math 1A, Math 1B, Phys 2A, Phys 2B,) according to the two-year plan in order to provide students with the opportunity to complete the majority of the core requirements for a variety of engineering and science majors at LCC.

IV. Equipment

Description/Evaluation:

The two large lecture rooms, newly furnished small lecture room and each of the laboratories with the exception of the chemistry lab (MS-114) contain smart room technology with Eno whiteboards. A periodic table chart is located in each large lecture room.

At the biological science end of the building, each laboratory classroom has a complete set of Brightfield Compound Microscopes and a partial set of Dissection Microscopes. The microscopes are regularly serviced each June in order to maximize performance throughout the

year. There are six Phase-Contrast Compound Microscopes for use in Microbiology. The microscope slide collection contains thousands of slides in cytology, histology, botany, zoology and microbiology. The laboratory classroom used for general biology is equipped with centrifuges, a spectroscope, and a spectrophotometer. The preparation room contains two autoclaves and several stir/hot plates. The laboratory classroom dedicated to Microbiology, Human Anatomy and Physiology has an extensive skeletal collection of real bone purchased before such displays became unavailable. The same room also contains a large number of appropriate models, displays, and charts. The small lecture classroom houses an exceptional natural history collection of local birds and mammals. A portion of the collection is also displayed in the central hallway of the Math-Science building. The biological science storage area contains a cold room with refrigerated aquaria in addition to areas for the storage of preserved specimens, an insect collection, a skin collection, and a botanical collection. One biology storage area was taken over by the maintenance department for the upgraded heating system in fall 2012. Additional storage area for the displaced specimens and equipment has not yet been identify. One suggestion would be to move the specimen cases to MS-102.

The biological science laboratory classrooms are well equipped. All equipment is available for student use, a condition not always found in the laboratories at larger institutions. The compound microscopes have excellent optics and serve the students very well. However, due to the considerable use the microscopes are given each semester, maintenance is extremely important. The autoclaves, essential to offering Microbiology and other equipment need periodic servicing.

The program has an excellent collection of models, displays, and charts. The skeletal collection rivals those found in medical programs at some universities. The microscope slide collection is impressive and is being refined and supplemented each year. A replacement budget for broken slides is essential to maintain the quality of this collection.

It is extremely unusual for a community college to have a local bird and mammal collection. Lassen College's collection is extremely well done and diverse, providing an excellent learning tool for students in Natural History and Principles of Evolutionary, Organismal and Ecological Biology.

At the physical science end of the building are three laboratory classrooms one each devoted to Chemistry, Physics, and Geology. The math lab is currently scheduled in the Geology laboratory classroom. Additionally, there are two small rooms one of which serves as a balance room, with some storage available, the other houses telescopes, and earth science materials. A preparation and storage room primarily serves the Chemistry classes.

Although the science laboratories were well equipped when the campus was opened, the equipment utilized in the several of the science laboratories is outdated. The equipment needs to be systematically updated to reflect the changes in technology over the previous decade.

Specifically, the spectrophotometers used in both chemistry and biology are more than thirty years old. The equipment for the physics laboratory is either outdated or in many cases broken or missing. The autoclave and incubators crucial to offering Microbiology received significant use each year and will need to be replaced. The physiology laboratories being offered at major universities are generally linked to the computer. Digital technology is in generally use at most educational institutions and the expected norm in industry. Since the cost of updating all of the laboratories would be prohibitive, it is recommended that an ongoing replacement budget be implemented. The budget would allow the gradual replacement and modernization of equipment over probably the next decade. The physics courses were the first to receive a major influx of updated equipment in Fall 2017.

The Maintenance Department should do regularly scheduled testing of the fume hoods in the Chemistry laboratory. Chemical and dissection wastes continue to accumulate from teaching laboratory sciences classes and must be safely disposed of annually.

A copier is available for small copying jobs in the central storage area. The usage of the copier has increased over the years. In addition to the copying jobs, the copier also serves as the printer for faculty computers via the Internet connection. The copier is the sole printing device available in the building. When the copier machine is out of service, faculty have no backup printer available in the building. On occasion the copier room is left unlocked, creating possible Family Educational Rights and Privacy Act (FERPA) problems. A second printer for student use in the common area would help address this problem. Due to the importance of this machine for instruction, on-going maintenance is extremely important. All rooms in the Math/Science building have Internet connections. All faculty have computers with Internet connections in their offices. The six computers provided in the central area for student use and upgraded in 2016 are also connected to the Internet.

Planning Agenda:

- 1. Annually plan for the disposal of hazardous waste (chemical and preserved specimens)*
- 2. Install a smart board to the chemistry lab room (MS-114)*
- 3. Add equipment repair budget for biological and physical science*
- 4. Initiate a replacement of equipment budget for the natural science/mathematics program in order to systematically replace out dated equipment.*
- 5. Replace the autoclave and incubator for the Microbiology class*
- 6. Add a second small printer exclusively for student use in the unsecured area adjacent to the computers for student use.*

V: Outside Compliance Issues (if appropriate for program)

There are no outside compliance issues impacting the Natural Science/Mathematics program.

VI. Prioritized Recommendations

A. Prioritized Recommendations for Implementation by Program Staff

1. *Align core courses within the mathematics/natural science program with the C-ID descriptors as they become available for comparison.*
2. *Develop transfer degrees (SB 1440) in life and physical sciences (specifically Chemistry) as the Transfer Model Curriculum (TMC) become available.*
3. *Track the effect of implemented recommendations in subsequent student learning outcome assessments in order to better determine their effectiveness.*
4. *Implement “Pathways through Algebra Project” intervention to increase student success.*
5. *Pilot projects in Gatekeeper courses, incorporating active learning strategies, learning communities, student-peer mentoring and writing across the curriculum to increase student success.*
6. *Encourage students to fully utilize the Math Lab, Learning Center, NET TUTOR and Peer Tutors.*

B. Prioritized Recommendations for Inclusion in the Planning Process

Prioritized Recommendations for Inclusion in Education Master Plan

Natural Science/Mathematics Program – Fall 2018

Strategic Goal	Planning Agenda Item	Implementation Time Frame	Estimated Cost (implementation & ongoing)	Expected Outcome
4	<i>Hazardous waste disposal (chemical and preserved specimens)</i>	<i>Annually (on-going)</i>	<i>\$2,000</i>	<i>Provide safe and environmentally sound learning and working environment</i>
1	<i>Install a smart board tin the chemistry lab room (MS-114)</i>	<i>Fall 2018</i>	<i>IT budget</i>	<i>Improve the learning environment for science students</i>
2,4	<i>Add equipment repair budget for biological and physical science</i>	<i>On-going</i>	<i>\$2,000</i>	<i>Timely repair of essential science equipment</i>
2,3,4	<i>Initiate a replacement of equipment budget for the natural science/mathematics program</i>	<i>On-going for at least several years</i>	<i>\$10,000</i>	<i>Systematically replace out-of-date science equipment</i>
2,3,4	<i>Replace autoclave and incubator for Microbiology class</i>	<i>Fall 2018</i>	<i>\$10,000</i>	<i>Necessary for operation of class serving as a prerequisite for registered nursing programs</i>
1,2,3,4	<i>Schedule traditionally low enrollment core courses (Biol 4,</i>	<i>On-going</i>	<i>Currently in</i>	<i>Provide students with the opportunity to complete the</i>

	<i>Chem 1A, Chem 1B, Math 1A, Math 1B, Phys 2A, Phys 2B,)</i> <i>according to the two-year plan</i>		<i>budget</i>	<i>majority of the core requirements for a variety of engineering and science majors at LCC.</i>
<i>1,3</i>	<i>Continue purchase of NETTUTOR</i>	<i>On-going</i>	<i>Currently in budget</i>	<i>Provide tutoring opportunities leading to improved student success</i>
<i>1,4</i>	<i>Add a second small copier for student use in the central area of the Math-Science building</i>	<i>2018-2019</i>		<i>Avoid FERBA violations and provide backup printer in the Math-Science building</i>

Prioritized Recommendations for Inclusion in Institutional Effectiveness Master Plan

Natural Science/Mathematics Program – Fall 2018

Strategic Goal	Planning Agenda Item	Implementation Time Frame	Estimated Cost (implementation & ongoing)	Expected Outcome
<i>1,4</i>	<i>Assess the relationship between poor attendance and lack of success in mathematics and science courses and identify the primary factor contributing to poor attendance.</i>	<i>2018-2019</i>	<i>No additional cost</i>	<i>Improve student success and retention</i>
<i>1,4</i>	<i>Pilot a project to improve attendance in mathematics and science courses and assess impact on success rates.</i>	<i>2018-2019</i>	<i>Unknown at this time</i>	<i>Improve student success and retention</i>

Section Two: Human Resource Planning

I. Program Staffing

Description/Evaluation:

Table XV

Full-Time Faculty Equivalent by Instructional Area

Instructional Area	2014/2015 Full-time Faculty	2015/2016 Full-time Faculty	2016/2017 Full-time Faculty	2013/2014 FTEF	2014/2015 FTEF	2015/2016 FTEF	2016/2017 FTEF
Anthropology*	0.20	0.20	0.20	1.2	1.2	1.0	1.0
Biological Science	1.0	1.0	2.0	1.4	1.55	2.32	2.50
Chemistry	1.0	1.0	1.0	1.03	1.03	1.03	1.20
Geology	-	-	-	0.35	0.35	0.35	0.35
Mathematics	4.65	5.0	3.65	8.41	9.40	9.20	8.40
Physical Science	-	-	-	0.40	0.30	0.30	0.30
Physics	0.35	-	0.35	-	0.35	-	0.35
Natural Science Program Total	7.00	7.00	7.00	12.58	13.97	14.10	13.83

Anthropology includes Cultural Anthropology*

There are four full-time tenured faculty assigned to Mathematics (one instructing Physics courses during alternate years), three full-time tenured faculty assigned to Natural Science (two in Biological Science and one in Chemistry). The retiring Chemistry instructor was replaced and an additional instructor in Biological Science was added in Fall 2016. One full-time faculty assigned to Mathematics who retired Spring 2016 replaced for Fall 2018 is assigned to instruct 50% on campus and 50% in the prison environment for a total of five full-time faculty assigned to mathematics. One full-time tenured faculty assigned to Biological Science and instructing consistently high enrollment Allied Health classes (Human Anatomy & Physiology and Microbiology) retired in Spring 2018. The position should be replaced as soon as possible in order to continue preparing students for entry into the Licensed Vocational and registered Nursing upgrade programs. Adjunct instructors are used to fill-out the schedule particularly teaching courses in Anthropology, Geology, Mathematics and Physical Science. The Instructional Support Specialist II (classified position) for the Natural Science/Mathematics Program was replaced in fall 2011. The Instructional Support Specialist II began teaching as an adjunct faculty member in Biological Science and Health Occupations in Summer 2017.

During the 2016-17 academic year the Natural Science/Mathematics program generated 285 FTEs of the college total of 1,589 FTEs. Meaning that 18% of the college FTE's were generated by the Natural Science/Mathematics program. During the same year the Natural Science/Mathematics program as a whole generates 22.2 FTEs per FTEF.

Table XVI

Faculty Load (Full-time, Overload, Part-Time) by Instructional Area

Instructional Area	2014/2015	2014/2015	2014/2015	2015/2016	2015/2016	2015/2016	2016/2017	2016/2017	2016/2017
	Full-time Faculty	Overload	Adjunct	Full-time Faculty	Overload	Adjunct	Full-time Faculty	Overload	Adjunct
Anthropology	0.10	-	1.10	0.10	-	0.90	0.10	-	0.90
Biological Science	1.38	0.85	0.17	2.15	0.50	0.17	2.15	0.42	0.35
Chemistry	1.03	-	-	1.03	-	-	1.2	0.60	-
Geology	-	-	0.35	-	-	0.35	-	-	0.35
Mathematics	5.67	3.84	3.03	5.79	3.19	2.34	5.24	5.04	1.54
Physical Science	-	-	0.3	-	-	0.3	-	-	0.3
Physics	0.35	0.17	-	-	-	-	0.35	0.17	-
Natural Science Program Total	8.42	4.87	4.86	8.97	3.69	4.07	8.77	6.06	3.44

The full-time mathematics instructors generally teach overloads each semester. With insufficient qualified adjunct instructor in mathematics and biological science in the geographic area, close attention to the potential need to hire additional full-time instructors must continue.

The college has been unable to consistently staff Astronomy and other physical science classes since the retirement of the half-time physical science instructor who retired Spring 2010. The geology classes taught by an adjunct faculty member have consistently exceeded the capacity of the laboratory classroom. Students are not being served and the institution is missing out on potential revenue due to the lack of the ability to meet student need in physical science courses. A physical science instructor capable of teaching Astronomy, Geology, Physical Geography and Physical Science should be hired as soon as possible. Biological science offerings have increased since the hiring of a second full-time instructor beginning Fall 2016.

The Instructional Support Specialist II hired in fall 2011 has focused primarily on providing support for biological science. The position has on occasion provided temporary support to geology, physics, mathematics and chemistry. On-going instructional support for the physical

science laboratory and mathematics classes needs to be provided through an adjustment to the schedule of the Instructional Support Specialist II particularly when scheduling or enrollments in biological science classes provide that opportunity. More technology, group work and labs are being applied in mathematics classrooms. Combine that with the increase in full-time tenured faculty and the aforementioned Instructional Support Specialist II scheduling concerns and the solution is to hire an additional Math/Science Instructional Support Specialist II.

Planning Agenda:

- 1. Re-align the schedule of the Instructional Support Specialist II to provide on-going support for physical science laboratory classes.*
- 2. Replace the biological science instructor teaching Human Anatomy & Physiology and Microbiology who retired Spring 2018*
- 3. Add a physical science instructor for instruction in a combination of physical science courses (Astronomy, Physics, Geology, Physical Geography, and/or Physical Science) by Fall 2020*
- 4. Hire an additional Math/Science Instructional Support Specialist II*

II. Professional Development

Description/Evaluation:

The full-time instructors keep current in their professions by attending conferences, training on/using additional instructional support materials, and reading professional periodicals. The faculty has taken advantage of Flex activities for professional development, both on and off campus. All faculty are actively involved with on-campus committees.

Planning Agenda:

None

III. Student Outcomes

Description/Evaluation:

Adequate staffing of appropriate full-time faculty is essential to the obtainment of identified objectives by students. When the college is unable to offer courses necessary in order for students to complete degrees and certificates within the expected two-year time period, lack of student outcomes is the inevitable result. Within the Natural Science/Mathematics program, the hiring of a physical science instructor capable of teaching Astronomy, Geology, Physical Geography and Physical Science is the most pressing need. The replacement of the full-time tenured faculty assigned to Biological Science, instructing consistently high enrollment Allied Health classes (Human Anatomy & Physiology and Microbiology) who retired in Spring 2018 is crucial. The position is essential in order to

continue preparing students for entry into the Licensed Vocational and registered Nursing upgrade programs.

Planning Agenda:

1. Replace the biological science instructor teaching Human Anatomy & Physiology and Microbiology who retired Spring 2018
2. Add a physical science instructor for instruction in a combination of physical science courses (Astronomy, Physics, Geology, Physical Geography, and/or Physical Science) by Fall 2020

IV. Prioritized Recommendation

Prioritized Recommendations for Implementation by Program Staff

None

Prioritized Recommendations for Inclusion in Human Resource Master Plan

Natural Science/Mathematics Program – Fall 2018

Strategic Goal	Planning Agenda Item	Implementation Time Frame	Estimated Cost (implementation & ongoing)	Expected Outcome
2,3,4	Realign the schedule of the Instructional Support Specialist in order to provide ongoing support for physical science and mathematics courses	Fall 2018	No cost	Provide improved laboratory experiences for students in physical science classes and improved laboratory safety
2,3,4	Replace Biological Science Instructor retired Spring 2018	Fall 2018	\$90,000	Sustain growth biological science offerings (Human Anatomy & Physiology, Microbiology, extra sections), increasing number of degrees and GE certificates awarded
2,3,4	Hire an additional Instructional Support Specialist II to adjust additional faculty hires and mathematics lab activities	Spring 2019	\$40,000	Provide support for more student-centered opportunities in the classroom. Increased student success. Mitigation of student success issues arising from AB 705 problems.
2,3,4	Physical Science Instructor	Fall 2020	\$90,000	Increase physical science offerings (Astronomy, Physics, Geology, Physical Geography, Physical Science), increasing number of degrees and GE certificates awarded

Section Three: Facilities Planning

I. Facilities

Description/Evaluation:

The Math/Science building was designed with two large lecture rooms in the center adjacent to the faculty offices. The two ends of the building each contain a central preparation and storage areas and three classrooms. One end of the building is dedicated to physical science and the other to biological science. Each of the laboratory classrooms is designed for twenty-four students per room. Each central preparation area contains a safety shower/eye-wash station. The two lecture rooms each providing seating for thirty-five students are separated by a partition, which can be opened to accommodate a large class (up to seventy students). One of the traditional laboratory classrooms at the biological science end of the building was converted into a lecture classroom in fall 2012. Additionally, one of the small prep rooms at the biological science end of the building was used to house the building's heating pump installed during fall 2012. Additional storage area for the displaced specimens and equipment has not yet been identify. One suggestion would be to move the specimen cases to MS-102.

Each faculty office houses a single instructor with room for a desk with a computer, shelves for books, and a filing cabinet. The faculty offices will accommodate one or two students during office hours. With the increase in full-time faculty there is no place for the adjunct faculty to hold office hours unless they meet with students in the central area in front of the full-time offices. This is less than desirable as it doesn't allow for private conversations with students.

The central area in front of the faculty offices contains large tables and six computers providing a mini-mathematics/science computer laboratory. Students frequently use this area to study.

Lecture space is limited in the math/science building, resulting in competition between mathematics and science classes for rooms designed specifically for lectures (MS-121 and MS-122). Because of this some lecture classes are held in rooms designed for laboratory classes. Laboratory rooms are not well suited for lectures; the tables are oriented so that students face each other. In order to address the issue, MS-125 was converted from a laboratory classroom to a small lecture classroom during the 2012-2013 academic year. This small classroom currently has inadequate whiteboard to meet the needs of most instructors. Additionally, the installation of the building's heating pump adjacent to the wall behind the lecture podium makes it extremely difficult for the instructor to hear student questions.

In order to have fully flexible lecture/lab classrooms the whiteboard problem must be resolved (electronic drop down boards may serve as a solution). The seats must be comfortable for the students. The older, slightly upgraded lab chairs are not adequate for the flexible lecture/lab classroom model. The tables must function as both lab and lecture tables (tables wider than traditional tables with seats able to be moved is one solution). The following classrooms should be fully retrofitted with more whiteboard space, appropriate chairs and appropriate tables as needed: MS-114 (is currently used for chemistry as both lecture and lab classrooms), MS-112 (is currently used for the Math Lab half of the daytime and the geology class), MS-116 (is primarily used on alternate years for the Physics class), and MS-125 (underused perhaps due to whiteboard problem). This would maximize classroom use, address the lecture room shortage, and allow faculty to teach in the best environment for student success. If properly done, both the lab and lecture students would benefit. In addition, the Math Lab should be moved to MS-102. The partial installation of a solid wall between MS-101 and MS-102 should be reversed returning the room to its original size and increasing the usefulness of those rooms. This would open up a retrofitted flexible lecture/lab classroom (MS-112) and effectively add a new classroom for lecture/lab instruction. Also maximizing use in MS-114, MS-116, and MS 125 would give more flexibility in scheduling.

The partition between the two lecture rooms (MS-121 and MS-122) that allows for larger lectures is cumbersome and awkward to operate smoothly and properly, and is prone to malfunction. Additionally, this partition transmits sound easily from one room to the other which can be a distraction at times, especially during examinations. The time to replace the partition with a solid soundproof wall is long overdue.

The laboratory facilities for the natural science program are well designed. The central location of the preparation and storage facilities provides for the efficient servicing of the three associated classrooms.

During the 2011-2013 academic years all of the classrooms in the Math-Science building were painted and smart board technology installed in all classrooms except MS-114, the Chemistry Laboratory. White board with projector technology was installed in MS-114 during Spring 2017. The overall appearance and functionality of the classrooms have been greatly improved. The computer laboratory/student study area in front of the faculty offices is well utilized and although occasionally becoming noisy is generally functioning well. The chairs in each of the laboratory classrooms have been in continuous use for about twenty years. Many of the stools have been broken and repaired. The cushions are flattened and the legs and backs squeak each time a student moves. Comments on the uncomfortable chairs frequently occurred on the student evaluations. The systematical replacement of chairs in each of the classrooms was initiated in Fall 2016 with the replacement of chairs in MS-114, the Chemistry Laboratory. The student evaluations support the instructor identified need to replace the chairs in all of the other

laboratory classrooms as soon as possible. MS-121 and MS 122 have hard plastics chairs. These hard uncomfortable chairs need to be replaced.

Maintaining the temperature in the building as close to 72°F as possible to prevent unsafe conditions due to chemicals stored in the laboratory and prep rooms is very important for the safety of facilities and personnel. Keeping the centrally located rooms (MS-121 and MS-122) and the rest of the classrooms at the temperatures optimal for a successful learning environment is also necessary for student success. There have been ongoing temperature problems and the facilities department has had to make routine adjustments.

Both biology and chemistry class generated some level of hazardous waste. The maintenance department must continue to budget and contract for the safe removal of these materials.

Planning Agenda:

1. *Annually plan for the disposal of hazardous waste (chemical and preserved specimens)*
2. *Install Smart board in the chemistry lab (MS-114)*
3. *Systematically replace the chairs in each of the classrooms, with the exception of chemistry replaced 2016-2017 over the next several years.*
4. *Replace the moveable partition between the lecture rooms MS-121 and MS-122 with a sound proof barrier.*
5. *Retrofit the following classrooms (MS112, MS-114, MS-116, MS-125) into flexible lecture/lab classrooms with additional whiteboards (electric dropdown boards may be needed),*
6. *Remove the partial solid wall partition between MS-101 and MS-102 and move the Math Lab to MS-101/102*
7. *Continue to keep and monitor the temperature in all the rooms to the appropriate level for both safety and increased student success.*

II. Prioritized Recommendations

Prioritized Recommendations for Implementation by Program Staff

None

Prioritized Recommendations for Inclusion in the Facilities Master Plan

Natural Science/Mathematics Program – Fall 2018

Strategic Goal	Planning Agenda Item	Implementation Time Frame	Estimated Cost (implementation & ongoing)	Expected Outcome
4	<i>Hazardous waste disposal (chemical and preserved specimens)</i>	<i>Annually (on-going)</i>	<i>\$2,000</i>	<i>Provide safe and environmentally sound learning and working</i>

				<i>environment</i>
<i>1,3</i>	<i>Install Smart board in chemistry lab (MS-114)</i>	<i>Fall 2018</i>		<i>Improve the learning environment for science students</i>
<i>3,4</i>	<i>Systematically replace the chairs in each of the classrooms over the next several years.</i>	<i>One time over next several years</i>	<i>\$3,000/ room of 24 chairs</i>	<i>Improve the learning and safety environment for students</i>
<i>3,4</i>	<i>Replace the moveable partition between the lecture rooms MS-121 and MS-122 with a solid soundproof wall.</i>	<i>Summer 2018</i>	<i>\$10,000</i>	<i>Improve the learning environment for mathematics and science students</i>
<i>3,4</i>	<i>Retrofit 112, 114, 116, 125 into flexible lecture/lab classrooms.</i>	<i>One time</i>		<i>Improve the learning environment for mathematics and science students</i>
<i>3,4</i>	<i>Remove the partial solid wall partition between MS-101 and MS-102 and move the Math Lab to MS-101/102</i>	<i>Summer 2018</i>		<i>Provide additional space for Math Lab, while freeing classroom for improved scheduling</i>
<i>3,4</i>	<i>Continue to keep and monitor the temperature in all the rooms.</i>	<i>Annually (on-going)</i>		<i>Provide safe and environmentally sound learning and working environment</i>

Section Four: Technology Planning

I. Technology

Description/Evaluation:

During the 2016-2017 academic year, new leased laptops were provided to all full-time faculty. The college has an ongoing agreement with “Canvas” to support online instruction.

The recent technology upgrades have significantly impact instruction. Faculty utilizes the laptops to bring innovative technology into the lecture classes. Despite the recent technological upgrades, the technology is not maintained. Work orders need to be honored in a timely manner such that technologies in place for instruction within these classrooms are functional. Currently, at least two classrooms MS 112 and 122 do not have a working sound system associated with the media projectors limiting instructional capabilities. Work orders to date to fix this problem have not been honored. Therefore there is an on-going need to maintain the technological capacities in all classrooms in the math and science building such that they are functional and can support the instructional needs of the faculty and students they serve. The technology upgrades for lecture delivery of instruction have not yet made their way into the laboratory exercises performed in the science labs. Significant investment of resources will be needed over the next few years in order to bring the science labs into the technology age.

Planning Agenda:

- 1. Add a smart board to the chemistry lab room (MS-114)*
- 2. Ensure that technology to allow for videos in all instructional classrooms in the Math-Science building is functional (specifically MS-122 and MS -112 are not currently operational)*
- 3. Purchase/upgrade faculty software and computers as needed for increase technology/software demands.*

II. Prioritized Recommendations

Prioritized Recommendations for Implementation by Program Staff

None

Prioritized Recommendations Inclusion in Institutional Technology Master Plan

Natural Science/Mathematics Program – Fall 2018

Strategic Goal	Planning Agenda Item	Implementation Time Frame	Estimated Cost (implementation & ongoing)	Expected Outcome
1,3	<i>Add a smart board to the chemistry lab room (MS-114)</i>	<i>Fall 2018</i>		<i>Improve the learning environment for science students</i>
1,3	<i>Ensure that technology to allow for videos in all instructional classrooms in the Math-Science building is functional (specifically MS-122 and MS - 112 are not currently operational)</i>	<i>Summer 2018</i>	<i>IT maintenance budget</i>	<i>Maintain and improve the learning environment for mathematics and science students</i>
2,3,4	<i>Purchase/upgrade faculty software and computers as needed for increase technology/software demands.</i>	<i>On-going</i>	<i>5-yr technology refresh plan (\$100,000/yr)</i>	<i>Maintain and improve instruction through various modalities</i>

Student Learning Outcomes

Associate in Arts Degree University Studies—
Emphasis in Allied Health

Associate in Science Degree in Biology for
Transfer

Associate in Science for Transfer in Geology

Associate in Arts Degree General Studies –
Emphasis in Natural Science

Associate in Arts Degree University Studies –
Emphasis in Natural Science

Associate in Science in Nutrition and Dietetics
for Transfer

California State University General Education
Certificate of Achievement

Intersegmental General Education Transfer
Curriculum Certificate of Achievement

Associate in Arts Degree – University Studies: Emphasis in Allied Health [SLOs Approved June 10, 2008]

Upon completion of this degree the student will be able to:

1. Analyze information available regarding risk factors to a healthy lifestyle as well as behaviors that promote a healthy lifestyle; understand the impact of positive and negative factors on one's own health; and make lifestyle choices and changes to best promote a wellness balance for one's own life.
2. Relate the structures and functions of the various body systems in a human organism to the metabolic activities of a single selected body cell.
3. Analyze and relate the appropriate identification techniques to be utilized in the diagnosis of a potential life threatening infection.
4. Demonstrate an understanding of the basic methodologies of science.

Associate in Science Degree in Biology for Transfer

Upon completion of the specified degree, the student should be able to:

1. Apply the scientific method by stating a question; researching the topic; determining appropriate tests; performing tests; collecting analyzing, and presenting data; and finally proposing new questions about the topic.
2. Apply critical thinking to the examination of the principles of biology chemistry, and physics using proper laboratory techniques and procedures.
3. Demonstrate a basic understanding of the language, laws, theories and processes that are essential to the understanding of the structure of matter and how the structure determines its physical and chemical properties.
4. Describe the structure an function of molecular and cellular components and explain how they interact in a living cell.
5. Describe how cells interact to develop tissues and organs and how these contribute to a functional organism.
6. Demonstrate an understanding of the mechanisms driving evolution and describe similarities and difference of the major taxonomic groups.
7. Describe how organisms interact with one another and to their environment and are able to explain interactions at the population and community levels.

Associate in Science Degree - Geology for Transfer

Upon completion of the specified degree, the student should be able to:

1. Demonstrate an understanding of geologic time scale and timing of major events in Earth history.
2. Explain internal and external dynamic processes occurring within the earth system and analyze the effects on these processes on physical constitution of the earth.
3. Apply proper lab techniques and knowledge of theoretical concepts in geology to acquire and interpret geologic data and formulate new questions in a laboratory setting.

Associate in Arts Degree – General Studies: Emphasis in Natural Science [SLOs Approved June 10, 2008]

Upon completion of this degree the student will be able to:

1. Demonstrate an understanding of the basic methodologies of science.
2. Examine the influence that the acquisition of scientific knowledge has on the development of the world's civilizations.
3. Demonstrate a basic understand of the language, laws, theories, and processes that are fundamental to anthropology, astronomy, biology, chemistry meteorology, geology, and/or physics, through the observation and analysis of real life examples.

Associate in Arts Degree – University Studies: Emphasis in Natural Science [SLOs Approved June 10, 2008]

Upon completion of this degree the student will be able to:

1. Demonstrate an understanding of the basic methodologies of science.
2. Examine the influence that the acquisition of scientific knowledge has on the development of the world's civilizations.
3. Demonstrate a basic understand of the language, laws, theories, and processes that are fundamental to anthropology, astronomy, biology, chemistry meteorology, geology, and/or physics, through the observation and analysis of real life examples.

Associate in Science Degree in Nutrition and Dietetics for Transfer

Upon completion of the specified degree, the student should be able to:

1. Analyze and evaluate nutritional information, lifestyle, and special needs to make recommendations for an adequate and balanced diet as well as to make recommendations for dietary improvements.
2. Use the scientific method to develop and conduct laboratory experiments utilizing accepted laboratory practices.
3. Identify, describe, and investigate the influence of environmental and culture on the development of individual behavior as it relates to nutrition and dietetics.
4. Display skills and knowledge necessary to continue study at a California State University in preparation for certification and a career as a registered dietician.

Certificate of Achievement- Intersegmental General Education Transfer Certification (IGETC) [SLOs Approved]

Upon completion of the specified certificate, the student should be able to:

1. Understand and apply methods of inquiry for a variety of disciplines including the scientific method for scientific inquiry and appropriate methods for social and behavior science inquiries.
2. Explain and analyze relationships between science and other human activities.
3. Apply knowledge of the ways people act and have acted in response to their societies to express an appreciation for how diverse societies and social subgroups operate to understand social dynamics within historical and contemporary communities.
4. Understand ways in which people throughout the ages and in Western and non-Western cultures have responded to themselves and the world around them in artistic and cultural creation; apply this knowledge to make value judgments on cultural activities and artistic expressions and demonstrate an understanding of the interrelationship between the creative arts, the humanities and self.
5. Engage in verbal communication by participating in discussions, debates, and oral presentations utilizing proper rhetorical perspective, reasoning and advocacy, organization, accuracy, and the discovery, critical evaluation and reporting of information.
6. Compose effective written communications and essays with correct grammar, spelling, punctuation and appropriate language, style and format utilizing academically accepted means of researching, evaluating and documenting sources within written works.
7. Analyze, evaluate and explain theories, concepts and skills within varied disciplines using inductive and deductive processes and quantitative reasoning and application.
8. Demonstrate appreciation of themselves as living organisms through their choices for physical health, activities, stress management, relationships to the social and physical environment, and responsible decision-making.

Certificate of Achievement- California State University (CSU) General Education Certification [SLOs Approved]

Upon completion of the specified certificate, the student should be able to:

1. Understand and apply methods of inquiry for a variety of disciplines including the scientific method for scientific inquiry and appropriate methods for social and behavior science inquiries.
2. Explain and analyze relationships between science and other human activities.
3. Apply knowledge of the ways people act and have acted in response to their societies to express an appreciation for how diverse societies and social subgroups operate to understand social dynamics within historical and contemporary communities.
4. Understand ways in which people throughout the ages and in Western and non-Western cultures have responded to themselves and the world around them in artistic and cultural creation; apply this knowledge to make value judgments on cultural activities and artistic expressions and demonstrate an understanding of the interrelationship between the creative arts, the humanities and self.
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- organization, accuracy, and the discovery, critical evaluation and reporting of information.
6. Compose effective written communications and essays with correct grammar, spelling, punctuation and appropriate language, style and format utilizing academically accepted means of researching, evaluating and documenting sources within written works.
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Natural Science/Mathematics Instructional Program Review: Status of Curriculum Review


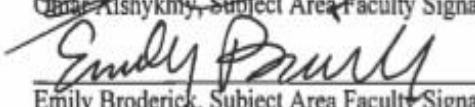
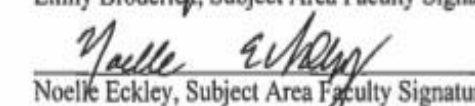
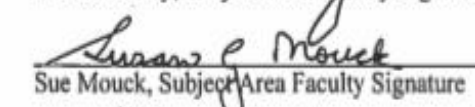
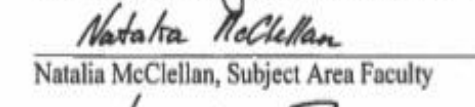

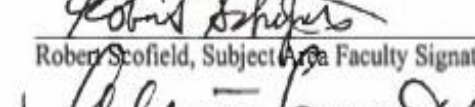
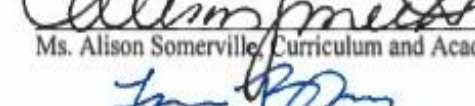
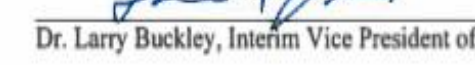
Natural Science/Mathematics/Physical Science IPR

Status of Curriculum Review May 15, 2018

Course	Curriculum Committee Review Completed	Curriculum Committee Review <u>Not</u> Completed
ANTH 1 Physical Anthropology	05/02/2017	
ASTR 1 Introduction to Astronomy	05/15/2018	
BIOL 1 Principles of Molecular and Cellular Biology	11/21/2017	
BIOL 4 Principles of Evolutionary Organismal and Ecological Biology	11/21/2017	
BIOL 10 Natural History of Plants & Animals	12/06/2016	
BIOL 20 Microbiology	03/03/2015	
BIOL 25 Human Anatomy & Physiology I	05/17/2016	
BIOL 26 Human Anatomy & Physiology II	05/17/2016	
BIOL 32 General Biology	12/06/2016	
BIOL 32L General Biology with Laboratory	08/29/2017	
CHEM 1A General Chemistry I	12/06/2016	
CHEM 1B General Chemistry II	12/06/2016	
CHEM 8 Introduction to Organic and Biochemistry	12/06/2016	
CHEM 45 Introduction to Inorganic Chemistry	09/19/2017	
CHEM 55 Introductory Chemistry	New	

	12/06/2016 Revised 09/19/2017	
GEOG 1 Physical Geography	03/20/2018	
GEOL 1 Physical Geology	05/15/2018	
GEOL 5 Historical Geology & Paleontology	05/15/2018	
MATH 1A Analytical Geometry and Calculus I	05/01/2018	
MATH 1B Analytical Geometry and Calculus II	05/01/2018	
MATH 1C Analytical Geometry and Calculus III	05/01/2018	
MATH 7 Trigonometry	05/01/2018	
MATH 8 Advanced Algebra	12/06/2016	
MATH 11A Concepts of Elementary School Mathematics I	04/17/2018	
MATH 11B Concepts of Elementary School Mathematics II	04/04/2018	
MATH 40 Elementary Statistics	05/01/2018	
MATH 60 Intermediate Algebra	05/01/2018	
MATH 101 Basic Mathematics	05/01/2018	
MATH 102 Pre-Algebra	05/01/2018	
MATH 103 Elementary Algebra	05/01/2018	
MATH 155 Math Lab –Basic Skills		02/19/2013
MATH 156 Math Labe – Pre-collegiate Algebra		02/19/2013

PHSC 1 General Physical Science	10/17/2017	
PHYS 2A General College Physics I	05/01/2018	
PHYS 2B General College Physics II	05/01/2018	
AA University Studies: Emphasis in Allied Health	05/15/2018	
AS-T in Biology	New 03/17/2015	
AS University Studies: Emphasis in Biological Science Major Preparation	Inactive 08/18/2015	
AS-T in Geology	05/15/2018	
AS University Studies: Emphasis Mathematics/Physical Science	Inactive 08/18/2015	
AA University Studies: Emphasis Natural Science	08/30/2016	
AA General Studies: Emphasis in Natural Science	08/30/2016	
AS-T Nutrition and Dietetics	New 09/01/2015	
General Ed Area A	09/19/2017	
General Ed Area D2	05/01/2018	

	5/2/18
Umar Alshykhly, Subject Area Faculty Signature	Date
	5/2/18
Emily Broderick, Subject Area Faculty Signature	Date
	5/2/18
Noelle Eckley, Subject Area Faculty Signature	Date
	05/02/2018
Sue Mouck, Subject Area Faculty Signature	Date
	05/04/2018
Natalia McClellan, Subject Area Faculty	Date
	5/3/18
Jackson Ng, Subject Area Faculty Signature	Date
	5/2/18
Robert Scofield, Subject Area Faculty Signature	Date
	5/7/18
Ms. Alison Somerville, Curriculum and Academic Standards Committee Chair Signature	Date
	5.3.2018
Dr. Larry Buckley, Interim Vice President of Academic Services	Date

Associate in Arts Degree University Studies—
Emphasis in Allied Health

Associate in Science Degree in Biology for
Transfer

Associate in Arts Degree General Studies –
Emphasis in Natural Science

Associate in Arts Degree University Studies –
Emphasis in Natural Science

Associate in Science in Geology for Transfer

California State University General Education
Certificate of Achievement

Intersegmental General Education Transfer
Curriculum Certificate of Achievement

ALLIED HEALTH

Associate in Arts Degree University Studies – Emphasis in Allied Health

Required Core Courses: 20 units

Total Units: 60 units

Course Number	Course Title	Fall	Spring
BIO 20	Microbiology	5	
BIO 25	Human Anatomy & Physiology I	4	
BIO 26	Human Anatomy & Physiology II		4
CHEM 8	Introduction to Organic and Biochemistry		4
PSY 1	Introduction to Psychology	3	3

Focused Electives that may be required for health and medical degrees

	Focused Electives	Fall	Spring
ANTHR 2	Cultural Anthropology		3
HLTH 25	Understanding Nutrition	3	3
CD/PSY 31	Child Development: Conception through Adolescence	3	3
SOC 1	Introduction to Sociology	3	3

Select General Education Option (CSU or IGETC)

2017-2018

BIOLOGY

Associate in Science Degree in Biology for Transfer

Required Core Courses: 32 units

Total Units: 60 units

Complete the following seven courses:

Course Number	Course Title	Fall	Spring
BIO 1	Principles of Molecular and Cellular Biology		4
BIO 4	Principles of Evolutional, Organismal, and Ecological Biology		5
CHEM 1A	General Chemistry I	5	
CHEM 1B	General Chemistry II		5
MATH 1A	Analytical Geometry and Calculus I	5	
PHYS 2A	General Physics I	4	
PHYS 2B	General Physics II		4

Completion of either the CSU STEM GE (33) or IGETC Option (31)

2017-2018

GEOLOGY

Associate in Science Degree in Geology for Transfer

Required Core Courses: 28 units

Total Units: 60 units

Complete the following six courses:

Course Number	Course Title	Fall	Spring
CHEM 1A	General Chemistry I	5	
CHEM 1B	General Chemistry II		5
GEOL 1	Physical Geology	4	
GEOL 5	Historical Geology and Paleontology		4
MATH 1A	Analytical Geometry and Calculus I	5	
MATH 1B	Analytical Geometry and Calculus II		5

Select General Education Option (CSU or IGETC) 39-42 units

2017-2018

NATURAL SCIENCE

Associate in Arts Degree General or University Studies – Emphasis in Natural Science

Required Core Courses: 18 units

Total Units: 60 units

Select a minimum of eighteen (18) units from the following courses in area of emphasis [including one course in life science and one course in physical science to meet Area B of the general education core requirements]:

Course Number	Course Title	Fall	Spring
AGR 10	Introduction to Animal Science		3(even)
AGR 19	Introduction to Soil Science	3 (odd)	
AGR 20	Introduction to Plant Science		4(odd)
ANTH 1	Physical Anthropology	3	3
ASTR 1	Astronomy		
BIOL 1	Principles of Molecular and Cellular Biology		4
BIOL 4	Principles of Evolutionary, Organismal, and Ecological Biology		5
BIOL 10	Natural History of Plants & Animals	4	
BIOL 20	Microbiology	5	
BIOL 25	Human Anatomy & Physiology I	4	
BIOL 26	Human Anatomy & Physiology II		4

BIOL 32L	General Biology with Laboratory	4	4
CHEM 1A	General Chemistry I	5	
CHEM 1B	General Chemistry II		5
CHEM 8	Introduction to Organic and Biochemistry		4
CHEM 45	Introduction to Chemistry	4	4
GEOG 1	Physical Geography		
GEOL 1	Physical Geology	4	
GEOL 5	Historical Geology & Paleontology		4
PHSC 1	Physical Science	3	3
PHYS 2A	General Physics I	4 (odd)	
PHYS 2B	General Physics II		4 (even)

Select General Education Option (CSU or IGETC) or General Education Requirements: 18 units

2017-2018

NUTRITION

Associate in Science Degree in Nutrition and Dietetics for Transfer

Required Core Courses: 28 units

Total Units: 60 units

Core 16 units:

Course Number	Course Title	Fall	Spring
BIOL 20	Microbiology	5	
CHEM 1A	General Chemistry I	5	
HLTH 25	Understanding Nutrition	3	3
PSY 1	Introduction to Psychology	3	3

Select 8 units from the following:

Course Number	Course Title	Fall	Spring
BIOL 25 &	Human Anatomy and Physiology I	4	
BIOL 26	Human Anatomy and Physiology II		4
OR			
CHEM 1B &	General Chemistry II		5
MATH 40	Introduction to Statistics	3	3

Select 8 units from the following:

Course Number	Course Title	Fall	Spring

CHEM 45	Introduction to Inorganic Chemistry	4	4
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Select General Education Option (CSU or IGETC) 39-42 units

2017-2018

CALIFORNIA STATE UNIVERSITY GENERAL EDUCATION CERTIFICATE OF ACHIEVEMENT

Total Units: 40 units

AREA A – English Language and Critical Thinking

One course from each area

1. Oral Communication:

Course Number	Course Title	Fall	Spring
SPCH 1	Fundamentals of Speech Communication	3	3

2. Written Communication:

Course Number	Course Title	Fall	Spring
ENGL 1	English Composition	3	3

3. Critical Thinking:

Course Number	Course Title	Fall	Spring
ENGL 9	Critical Thinking and Composition	3	3
PHIL 2	Critical Thinking	3	

AREA B – Scientific Inquiry and Quantitative Reasoning

One course from each area including at least one laboratory science course

1. Physical Universe:

Course	Course Title	Fall	Spring
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Number			
ASTR 1	Introduction to Astronomy (L)		
CHEM 1A	General Chemistry I (L)	5	
CHEM 1B	General Chemistry II (L)		5
CHEM 8	Introduction to Organic and Biochemistry (L)		4
CHEM 45	Introduction to Chemistry (L)	4	
GEOG 1	Physical Geography		3
GEOL 1	Physical Geology (L)	4 (even)	
GEOL 5	Historical Geology & Paleontology (L)	4(odd)	
PHSC 1	Physical Science	3	3
PHYS 2A	General Physics I (L)	4 (even)	
PHYS 2B	General Physics II (L)		4 (odd)

2. Life Forms:

Course Number	Course Title	Fall	Spring
AGR 20	Introduction to Plant Science		4(even)
ANTH 1	Physical Anthropology		3
BIOL 1	Principles of Molecular and Cellular Biology (L)		4
BIOL 4	Principles of Evolutionary, Organismal and Ecological Biology (L)		5
BIOL 10	Natural History of Plants & Animals (L)	4	
BIOL 20	Microbiology (L)	5	

BIOL 25	Human Anatomy & Physiology I (L)	4	
BIOL 26	Human Anatomy & Physiology II (L)		4
BIOL 32L	General Biology with Laboratory (L)	4	4

3. Laboratory Science (L): Any of the above (L) courses

4. Mathematics/Quantitative Reasoning:

Course Number	Course Title	Fall	Spring
MATH 1A	Analytical Geometry and Calculus I	5	
MATH 1B	Analytical Geometry and Calculus II		5
MATH 1C	Analytical Geometry and Calculus III		
MATH 7	Trigonometry	3	
MATH 8	Advanced Algebra		3
MATH 11A	Concepts of Elementary School Mathematics I	3(even)	
MATH 11B	Concepts of Elementary School Mathematics II		3(odd)
MATH 40	Elementary Statistics	3	3

AREA C – Arts and Humanities

Three of the following courses. Limit of two in one area

1. Arts (Art, Dance, Music, Theater):

Course Number	Course Title	Fall	Spring
ART 1A	Fundamentals of Two-Dimensional Design	3	
ART 1B	Fundamentals of Three-Dimensional Design		3

ART 2	Drawing	3	3
ART 3	Beginning Life Drawing		3(even)
ART 6	Survey of Art History: Prehistoric through Renaissance	3	
ART 7	Survey of Art History: Renaissance through Contemporary		3
ART 8	Art Appreciation	3(odd)	
ART 9	History of Asian Art	3	
ART 10A	Beginning Painting	3	3
ART 30	Introduction to Sculpture	3(odd)	
ART 36A	Beginning Ceramics	3	3
FILM 1	History of the Cinema	3	3
MUS 6	Music History from Antiquity to 1750	3	
MUS 7	Music History from 1750 to Modern Era		3
MUS 12	Music Appreciation		3

2. Humanities (Literature, Philosophy, Foreign Languages):

Course Number	Course Title	Fall	Spring
ENGL 2	Introduction to Literary Types	3	
ENGL 3	British Literature I	3(odd)	
ENGL 4	British Literature II		3(even)
ENGL 5	Survey of World Literature II		3(odd)
ENGL 10	Shakespeare		3 (odd)
ENGL 12	Survey of American Literature II	3(even)	
ENGL 33	Studies in Fiction		3(even)
HIST 14	World History, Beginning to 1500	3	
HIST 15	World History, 1500 to Present		3
HUM 1	Western Civilization: Prehistoric Times to	3	

	1600		
HUM 2	Western Civilization: 1600 to Present		3
PHIL 1	Introduction to Philosophy	3	
PHIL 10	Comparative World Religions	3	3
SPAN 1	First Course in Spanish		
SPAN 2	Second Course in Spanish		

AREA D – Social Sciences

Three of the following courses in at least two disciplines

1. Anthropology and Archeology:

Course Number	Course Title	Fall	Spring
ANTH 2	Cultural Anthropology		3
ANTH 3	Introduction to Archaeology		3

2. Economics:

Course Number	Course Title	Fall	Spring
AGR 2	Agricultural Economics		3(even)
ECON 10	Macro-economics	3	
ECON 11	Micro-economics		3

3. Ethnic Studies:

Course Number	Course Title	Fall	Spring
ES 1	Ethnic Minorities in America	3	3

4. Gender Studies:

Course Number	Course Title	Fall	Spring
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SOC 4	Introduction to Gender	3	
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5. Geography:

Course Number	Course Title	Fall	Spring
GEOG 2	Cultural Geography	3	

6. History:

Course Number	Course Title	Fall	Spring
HIST 14	World History: Beginning to 1500	3	
HIST 15	World History: 1500 to Present		3
HIST 16	U.S. History	3	3
HIST 17	Post Civil War U.S. History	3	3

7. Interdisciplinary Social or Behavioral Science:

Course Number	Course Title	Fall	Spring
CD/PSY 31	Child Development: Conception through Adolescence	3	3
JOUR 4	Mass Communication and Society		3
PSY 18	Human Development: A Life Span	3	3

8. Political Science, Government and Legal Institutions:

Course Number	Course Title	Fall	Spring
AJ 20	Criminal Law	3	
PLSC 1	American Institutions	3	3

9. Psychology:

Course Number	Course Title	Fall	Spring
PSY 1	Introduction to Psychology	3	3

PSY 2	Principles of Psychology	3	3
PSY 5	Introduction to Research Methods		3 (even)
PSY 6	Abnormal Psychology	3	3

10. Sociology and Criminology:

Course Number	Course Title	Fall	Spring
SOC 1	Introduction to Sociology	3	3
SOC 2	Social Problems	3	3

AREA E – Lifelong Understanding and Self-Development

One course or three units

Course Number	Course Title	Fall	Spring
CD/PSY 31	Child Development: Conception through Adolescence	3	3
CG 1	Strategies for Creating success in College and in Life	3	
HLTH 2	Personal Health	3	3
HLTH 25	Understanding Nutrition	3	3
HUIS 30	Pharmacology of Drugs of Abuse		3
PE 15	Introduction to Kinesiology	3	
PSY 1	Introduction to Psychology	3	3
PSY 2	Principles of Psychology	3	3
PSY 18	Human Development: A Life Span	3	3
PSY 33	Psychology of Personal Adjustment	3	3
SOC 3	Family Relations	3	3

See a counselor to prepare your educational plan with the latest scheduling information.

Natural Science/Mathematics Annual Scheduling Plan

COURSE/SESSION	FALL	SPRING	SUMMER
Anthr 1- Physical Anthropology	(2) C	(2) C, (1) E	
Bio 1 – Principles of Molecular and Cellular Biology		(1) D	
Bio 4 – Principles of Evolutionary, Organismal, and Ecological Biology		(1) D (even)	
Bio 10 – Natural History of Plants & Animals	(1) D		
Bio 20 – Microbiology	(1) D		
Bio 25 – Human Anatomy & Physiology I	(1) D, (1) E (odd)		
Bio 26 – Human Anatomy & Physiology II		(1) D, (1) E (even)	
Bio 32L – General Biology with Laboratory	(1) D, (1) E (even)	(1) D	(1) D
Chem 1A – General Chemistry I	(1) D		
Chem 1B – General Chemistry II		(1) D	
Chem 8 – Introduction to Organic and Biochemistry		(1) D	
Chem 45 – Introduction to Inorganic Chemistry	(1) D	(1) D (odd), (1) E (even)	
Chem 55 – Introductory Chemistry	(1) D	(1) E (odd)	
Geog 1 – Physical Geography			
Geol 1 – Physical Geology	(1) D		
Geol 5 – Historical Geology & Paleontology		(1) D	
Math 1A – Analytical Geometry and Calculus I	(1) D		

Math 1B – Analytical Geometry and Calculus II		(1) D	
Math 1C– Analytical Geometry and Calculus III			
Math 7 - Trigonometry	(1) D (even), N (odd)		
Math 8 – Advanced Algebra		(1) D (even), E (odd)	
Math 40 - Elementary Statistics	(1) D	(2) D, (1) O	(1) O
Math 60 – Intermediate Algebra	(2) D, (1) C	(2) D, (1) E, (1) C, (1) O	(1) C, (1) O
Math 101 – Basic Mathematics	(2) C	(2) C	(1) C
Math 102 – Pre-algebra	(1) D, (2) C	(1) D, (1) E, (2) C, (1) O	(1) C (1) O
Math 103 – Elementary Algebra	(3) D, (1) E, (2) C, (1) O	(2) D, (1) E, (2) C, (1) O	(1) C, (1) O
Math 155 – Math Lab - Basic Skills	(1) D	(1) D	
Math 156 – Math Lab – Pre-collegiate Algebra	(1) D,	(1) D,	
PHSC 1 – General Physical Science	(1) O	(1) O	
Phys 1A – General Physics I	(1) D (odd)		
Phys 1B – General Physics II		(1) D (even)	

() – sections; D- Day; E- Evening; C- Correspondence; O- Online

Natural Science/Mathematics
Instructional Program Review
Student Evaluation Comments

Q16 Please elaborate on your responses and include any additional facilities-related comments:

Answered: 66 Skipped: 157

#	RESPONSES	DATE	
1	uncomfortable enough to cause distraction.	3/22/2018 4:39 PM	
2	usually very cold	3/22/2018 4:12 PM	
3	The chairs within the lab we use are absolutely and completely atrocious. They are ancient and should have been replaced a long time ago.	3/20/2018 2:21 PM	
4	The chairs in the math and science building are very old and almost dysfunctional. Specifically the ones in the lab rooms.	3/20/2018 2:16 PM	
5	Chairs are loud and uncomfortable	3/20/2018 11:35 AM	
6	chairs in lab are old and squeak loudly	3/18/2018 3:51 PM	
7	i frequently have issues with the lab chairs	3/18/2018 3:47 PM	
8	the chairs in teh lab are very uncomfortable	3/18/2018 3:43 PM	
9	need new chairs	3/18/2018 3:40 PM	
10	Chairs squeaky and uncomfortable	3/15/2018 3:47 PM	
11	Chairs are terrible, need new ones	3/15/2018 3:39 PM	
12	Chairs make loud noises	3/15/2018 3:35 PM	
13	Too dark when projector is used Chairs are not comfortable	3/15/2018 3:33 PM	
14	I have light sensitivity, most lights are too bright.	3/15/2018 3:20 PM	
15	Its an online class	3/14/2018 11:30 AM	
16	The temperature was never nice	3/13/2018 11:01 AM	
17	Love everything about this college!	3/12/2018 5:53 PM	
18	The classroom where we have Bio 25 and Micro at, was sometimes really cold for all the students and the teacher, and we would sit in class with our jackets on. The lab, however was never too cold, partly because we would use our bunsen burners to warm up the lab room.	3/12/2018 10:31 AM	
19	N/A	3/12/2018 8:25 AM	
20	online course, not on campus.	3/11/2018 8:53 PM	
21	I'm taking an online class this semester	3/10/2018 9:48 PM	
22	I am currently a student through online courses.	3/10/2018 3:57 PM	
23	n/a due to it being an online class	3/9/2018 11:35 PM	
24	That it's in good condition just would like to see more hours given to students in tutoring more	3/9/2018 11:04 PM	
25	n/a	3/9/2018 7:10 PM	
26	I really enjoy going into the science lab. There's a lot of space to do my work and instructors are always willing to help me.	29	I think everything they are doing in this
27	The math and science facility meet all my standards. I'm comfortable in the learning environment provided.		course is good and I
28	Chairs are clearly old and worn out/well used and could be replaced at this point. It is also often cold throughout the math/science building when the weather is cold.		

	think that the facility is doing a good job	3/9/2018 12:41 PM
		3/9/2018 12:37 PM
		3/9/2018 10:41 AM
30	The temperature control in the sciences building, though necessary to preserve some specimens, is somewhat distracting when it is too hot or too cold to focus properly.	
31	Sometimes classroom viewing is hard at certain angles.	3/9/2018 10:18 AM
32	IN ROOM 125 THE HEATER IS LOUD SO THE INSTRUCTOR HAS DIFFICULTY HEARING THE STUDENTS QUESTIONS. THE DOOR IN ROOM 125 CLOSEST TO THE PARKING LOT, IT IS VERY LOUD WHEN OPENING AND DISTRACTING IF SOMEONE COMES IN LATE. IN ROOM 123 THE CHAIRS NEED UPDATING. THEY ARE UNEVEN. THE CHAIRS IN THE STUDY AREA OUTSIDE THE INSTRUCTORS OFFICE IN THE MATH/SCIENCE BUILDING, DO NOT FUNCTION WELL. THEY NEED REPLACED OR REPAIRED.	3/8/2018 12:11 PM
33	WHEN IT IS COLD OUTSIDE, THE CLASSROOM IS ALSO COLD AND THE BUILDING NEEDS TO BE WARMER.	3/8/2018 11:58 AM
34	When the weather is cold outside, the Math and Science Building is far too cold, and there is no regulation in the temperature of the building.	3/8/2018 11:49 AM
35	The chairs and tables are ok, but the way the classroom is constructed is very inefficient. Because of the curve of the classroom, no matter where you are sitting you have to sit at an angle and you cannot have the table right in front of you in order to be turned towards the board. It makes it quite difficult to take notes while looking at the board/instructor. Also, the classroom doesn't seem like it gets cleaned very often. The floors especially, are always very dirty.	3/8/2018 11:09 AM
36	The chairs in this classroom are not any good, we're sitting on hard plastic chairs. The chairs are also very low in comparison to the table. One issue I have with this classroom is how long it is. It makes it hard to pick a spot, and then see what is on the board at the other side of the room as it is so wide.	3/8/2018 11:03 AM
37	The classroom is fine. You can tell it is a little outdated, but it doesn't bother me too much.	3/8/2018 10:58 AM
38	The classrooms we use for this course is adequate, however I wish the chairs in the classroom used for laboratory would be adjustable. I myself have a lot of issues reaching myself up to the equipment when sitting down (such as microscopes on the table) and end up having to stand for hours while working. The lecture classroom is great, but sometimes the ventilation can get quite noisy. It can be very difficult for me to concentrate and hear everything that is being said, especially as I personally am hard of hearing.	3/8/2018 10:52 AM
39	The MS building is freezing	3/8/2018 10:43 AM
40	The MS building is always freezing	3/8/2018 10:39 AM
41	The math and science building is always too cold, no matter how much the students and teachers make complaints.	3/8/2018 10:35 AM
42	Since the space is limited there isn't much room at the desks to move and have your notebooks or study material layer out in front of you. You are pretty much elbow to elbow with your neighbors.	3/8/2018 10:35 AM
43	:)	3/8/2018 9:51 AM
44	There should be more space for the prepping of the science lab stuff.	3/7/2018 10:54 AM
45	Some of the rooms in the building are too cold in the mornings. Also, the labs need new chairs.	3/7/2018 10:35 AM
46	Everybody hates the chairs in the lab.	3/7/2018 10:31 AM
47	The lab rooms need new chairs. They are well used, but not the most ergonomic. They are so heavy and they do smash fingers when trying to move them. The south end of the building needs some work with the heating situation. It is always freezing in the lecture room, and hot in the lab room.	3/7/2018 10:16 AM
48	I take an online course	3/5/2018 12:03 PM
49	I am doing online so I am capable of providing my own comfort.	3/4/2018 6:19 PM
50	I am actually learning quite a bit while in this class. Math is not my strong suit.	3/2/2018 9:28 PM
51	I am taking an online class so facility related questions are N/A.	3/2/2018 6:56 PM

52	I don't use the facilities, the class is online.	3/2/2018 11:16 AM
53	I take this course as an online one.	3/2/2018 9:31 AM
54	They aren't really applicable because I am taking the course online	3/1/2018 7:58 PM

Q21 Describe how this course/program could be improved to better meet the needs of the student at Lassen Community College.

Answered: 106 Skipped: 117

#	RESPONSES	DATE
1	Professor does great job at explaining each lecture.	3/22/2018 5:27 PM
2	Everything is Okay. I see no need to change anything.	3/22/2018 5:19 PM
3	Fix lighting on projector. Also the clock and air conditioning.	3/22/2018 5:15 PM
4	I don't really think it has to be improved.	3/22/2018 5:12 PM
5	most comfortable and educational	3/22/2018 5:02 PM
6	It could be explained any many ways because its easier to understand in a similar way to peoples understanding.	3/22/2018 4:59 PM
7	I believe all resources are present and not utilized enough.	3/22/2018 4:51 PM
8	No complaints with Math 8	3/22/2018 4:46 PM
9	Get more teachers & listen to them. Get updated equipment.	3/22/2018 4:39 PM
10	Its not bad so far so nothing.	3/22/2018 4:30 PM
11	It is just fine.	3/22/2018 4:20 PM
12	more practice in class	3/22/2018 4:15 PM
13	online help and grade checking online.	3/22/2018 4:12 PM
14	Maybe not every single day of the week.	3/22/2018 4:06 PM
15	Slower speed instead of everyday a new subject.	3/22/2018 3:50 PM
16	Sometimes the projector goes to pink and blurry.	3/22/2018 3:47 PM
17	Overhead projector does not work correctly all the time. Sometimes it is pink and hard to read.	3/22/2018 3:42 PM
18	I have no qualms or issues with this course.	3/22/2018 3:29 PM
19	A longer class time. Better/more flexible math lab hours.	3/22/2018 3:25 PM
20	Increase Math Lab times.	3/22/2018 3:20 PM
21	The program does well and I enjoy it.	3/22/2018 2:58 PM
22	teacher could go slower when explaining how to do things.	3/22/2018 2:49 PM
23	More equipment in labs (more slides and wet mount material)	3/21/2018 11:03 AM
24	Respectful and friendly relationships between the instructor and students vastly help make the course more manageable.	3/20/2018 2:21 PM
25	Chairs are terrible!	3/20/2018 11:35 AM
26	Ms Broderick does a really great job at teaching the material and explaining it so we understand.	3/20/2018 11:32 AM

27	micro being offered in the evenings for those who are already in the nursing field but working its difficult	3/18/2018 3:51 PM
28	we really need new lab chairs	3/18/2018 3:47 PM
29	updated equipment for the lab would improve the program	3/18/2018 3:40 PM
30	enough equipment so I like it	3/18/2018 3:38 PM
31	offer anatomy 25 and 26 every semester, separate the slides from the rest	3/18/2018 3:35 PM
32	Possibly offer lab on more than one day a week for make-ups	3/15/2018 3:44 PM

33	Updated equipment in the lab could help, but overall class has been good.	3/15/2018 3:41 PM
34	Lecture/Tests done on canvas & meeting for labs would be way better	3/15/2018 3:39 PM
35	Better chairs	3/15/2018 3:33 PM
36	I think we need a better math teacher. She is terrible. Replace chairs in the lab	3/15/2018 3:30 PM
37	It is a pretty solid program	3/15/2018 3:26 PM
38	I think the program works, I've experienced only positive things during the course.	3/15/2018 3:23 PM
39	Cleaner desks and better chairs	3/15/2018 3:21 PM
40	Get newer equipment	3/15/2018 3:20 PM
41	Online class	3/14/2018 11:30 AM
42	Longer lab hours	3/13/2018 12:29 PM
43	Warmer classrooms and be able to work/fix test scores	3/13/2018 12:28 PM
44	Maybe this course would be better if it was a 4 day class	3/13/2018 12:24 PM
45	Seems fine	3/13/2018 12:14 PM
46	Explain things in a better way in lecture for students with disabilities.	3/13/2018 12:12 PM
47	Teach Astronomy	3/13/2018 12:10 PM
48	More tutoring help	3/13/2018 12:05 PM
49	It was fine	3/13/2018 11:59 AM
50	More time to study some things	3/13/2018 11:57 AM
51	More tutors would be good	3/13/2018 11:55 AM
52	Provided calculators would be nice, but not necessary	3/13/2018 11:52 AM
53	I think it is fine	3/13/2018 11:50 AM
54	Temperature control of the building always too hot.	3/13/2018 11:47 AM
55	Need updated textbook version	3/13/2018 11:42 AM
56	Make the lab after a lecture instead of an extra day in the middle of the day	3/13/2018 11:24 AM
57	There is nothing that I can think of that could make this course better, I am very happy with it.	3/13/2018 11:21 AM
58	It is good the way it is.	3/13/2018 11:17 AM
59	The thought the class was good and explained well.	3/13/2018 11:13 AM
60	More time in between quizzes	3/13/2018 11:09 AM
61	The only thing that I think would help is making the course only 4 days a week not 5. (labs and lectures combined)	3/13/2018 11:05 AM
62	Improve some equipment and more chemicals	3/13/2018 11:01 AM
63	Have the class be shorter	3/13/2018 10:56 AM
64	Everything in this course is perfect! Is my first math class online and love everything about it.	3/12/2018 5:53 PM
65	It's fine how it is	3/12/2018 9:31 AM
66	N/A	3/12/2018 8:25 AM
67	N/A	3/10/2018 3:57 PM
68	n/a	3/9/2018 11:35 PM
		69 It could help in this program

because I wanna be a nurse and with the elements you need is chemistry of all the mg, mm, and kg like it's a well know and exciting course. It makes A student like me work more and I'm ok with striving hard .

3/9/2018 11:04 PM

70	I think the course is just fine. I'm enjoying the class and the teacher is very good about taking the time to make sure we understand. It's an evening class which is a little inconvenient and they're really long classes.	3/9/2018 10:03 PM
71	n/a	3/9/2018 7:10 PM
72	Its fine the way it is.	3/9/2018 12:41 PM
73	No changes needed	3/9/2018 12:37 PM
74	Offer same classes at different times throughout the day to meet the needs of students who play sports or work.	3/9/2018 10:45 AM
75	I think that it is perfect the way it is	3/9/2018 10:41 AM
76	Improve the scales.	3/9/2018 10:18 AM
77	I think the course is great and Dr. Omar is an amazing teacher. Only thing I would like to see is make the course a 4 day a week thing. Having it 5 days with (labs and lectures) combined is just hard to workout with scheduling sometimes.	3/8/2018 5:36 PM
78	This program is met well, I wish that there was an option to take Chem 1a and 1b in both semesters (fall and spring) because I was not able to get my AA in Nutrition and Dietetics.	3/8/2018 11:49 AM
79	Increased funding	3/8/2018 11:46 AM
80	I cannot comment on the equipment as I am auditing the class I am only attending the lectures, not the laboratory experiments.	3/8/2018 11:09 AM
81	As much as this is the instructors choice, I think as a course itself the percentage of the tests that goes towards your grade versus the percentage for the homework towards your grade is unfair. The percentage for the tests are very high compared tot he homework, and the homework is a lot of work and extremely time consuming for less credit.	3/8/2018 11:03 AM
82	The class is good, however the sinks in the classroom needs some fixing as they do not work and make laboratory work more difficult when we need to use water (we have to run outside and use the water fountain...).	3/8/2018 10:58 AM
83	The equipment is often good and available, but some are not. Many of our slides for the microscopes used in this class are very old, and they barely can be used- and sometimes we don't have enough for everybody. I have also noticed a pattern of not always having everything we need for certain labs, so we have to skip steps.	3/8/2018 10:52 AM
84	Have lecture and lab be the same day, it would free up a lot of students schedules so they can take more classes	3/8/2018 10:39 AM
85	Have it be a MWF class, instead of TTh	3/8/2018 10:35 AM
86	Bigger rooms with bigger tables and more seats, also some of the equipment is a outdated.	3/8/2018 10:35 AM
87	None	3/8/2018 10:04 AM
88	It's good, very fast paced	3/8/2018 9:51 AM
89	More biology and chem classes, perhaps ecology and more geology and physics classes too.	3/7/2018 10:54 AM
90	N/A	3/7/2018 10:35 AM
91	Offering Micro at a different time or in the summer may help a student like myself who is also taking Anatomy and Physiology.	3/7/2018 10:31 AM
92	everything is good we were always offered everything we needed to perform our exercises in the lab, although the classrooms feels a little cold in the winter and the chairs are too old.	3/7/2018 10:27 AM
93	This is a great course/program and I wouldn't recommend changing anything!	3/7/2018 10:16 AM
94	Everything seems to meet my standards.	3/4/2018 6:19 PM

	program could have more clear postings for quizzes and tests. I missed the first quiz because all I found was the practice quizzes.	3/2/2018 6:56 PM
96	I have been unable to access my standing grade with the Pearson programs and my grade is not posted on Canvas. Making it easier for students to see how they're doing would be helpful.	3/2/2018 11:16 AM
97	slow down and let us learn it before going on.	3/1/2018 1:52 PM
98	N/A	3/1/2018 12:06 PM
99	I am taking this course online	3/1/2018 10:22 AM
100	Actually have the right textbook to match the course, because right now it does not.	2/28/2018 8:56 PM
101	Because it helps them better with the math course to get to another required math	2/28/2018 7:43 PM
102	Need more tutoring	2/28/2018 7:42 PM
103	A larger room.	2/28/2018 7:42 PM
104	It's fine	2/28/2018 7:41 PM
105	there is nothing i can think of to better this online course. I am extremely happy with how it is ran.	2/28/2018 1:22 PM
106	It is good.	2/28/2018 10:57 AM

Q22 Provide any additional comments on the course or program:

Answered: 46 Skipped: 177

#	RESPONSES	DATE
1	This program is helping me to get closer to my degree.	3/22/2018 5:19 PM
2	its educational at its finest.	3/22/2018 5:02 PM
3	I appreciate the availability of faculty and staff.	3/22/2018 4:51 PM
4	Teachers don't make much sense generally either don't care or care way too much. Administration doesn't listen to needs of the teachers/students.	3/22/2018 4:39 PM
5	relax, the speed is too high.	3/22/2018 3:50 PM
6	Please replace the chairs	3/20/2018 2:21 PM
7	The way this class was taught made me change my major to Biology.	3/20/2018 11:32 AM
8	summer classes would be great or weekend classes	3/18/2018 3:47 PM
9	take out the slides make micro a pre req for the course	3/18/2018 3:35 PM
10	Class is what I expected and I have learned a lot from it so far.	3/15/2018 3:41 PM
11	Tests should be broken down into four instead of two, with one final. So it's not so many chapters in one test.	3/15/2018 3:39 PM
12	Make the books cheaper	3/15/2018 3:30 PM
13	Change the chits in the lab	3/15/2018 3:26 PM
14	Mr. Ng does a fantastic Job	3/14/2018 11:30 AM
15	There are plenty of options in addition tutoring is available in several formats	3/13/2018 12:22 PM
16	Meeting every day causes scheduling issues for non-school issues	3/13/2018 12:17 PM
17	Provide a higher number of units for Math 40 to allow time and full comprehension	3/13/2018 11:47 AM
18	I believe it is a good program and it is helping me a lot,	3/13/2018 11:21 AM
19	The chairs are amazing, I really like them.	3/13/2018 11:15 AM
20	Not enough time for quizzes and exams	3/13/2018 11:07 AM

21	Dr. Omar is a great teacher. Just a hard class you need to focus in.	3/13/2018 11:05 AM
22	It is great to enjoy the facilities.	3/13/2018 11:01 AM
23	They should have more classes online like this because it helps out with busy students that trying to get a good career and with our crazy schedule this helps a lot! Love this class!!	3/12/2018 5:53 PM
24	Sue is an amazing teacher, I am so very thankful to have been able to take classes from her. She will be greatly missed. I enjoyed that she challenged us in class, yet was always willing to explain things and work with us in greater detail. Even though her class was tough, I would not have changed to a different teacher. She has taught us what we need to know for the class but has also shared with us how we will use that knowledge in the field of nursing. I think she has prepared me more for my career than most other teachers.	3/12/2018 10:31 AM
25	It is a good program	3/12/2018 9:31 AM
26	N/A	3/12/2018 8:25 AM
27	The online courses are such a convenience and I'd like to say thanks.	3/10/2018 3:57 PM
28	n/a	3/9/2018 11:35 PM
29	It's a fun class love it !!!! And the teacher is absolutely the best and makes learning fun .	3/9/2018 11:04 PM
30	I learn so much in my anatomy course. I enjoy it with a passion. Also the staff is extremely helpful and want the students to pass.	3/9/2018 12:41 PM
31	Im very fond of the math and science building.	3/9/2018 12:37 PM
32	N/A	3/8/2018 11:49 AM
33	It is a very throughout and good course, and the instructor we have makes sure that this class is thought as adequate as possible.	3/8/2018 10:58 AM
34	Overall, this course has been a joy so far. Even though this is a survey on the course itself, a good course doesn't happen without a good teacher and out instructor has been really great. Other than small minor things mentioned in previous comments, the class is well functioning.	3/8/2018 10:52 AM
35	Sue Mouck is the best science teacher ever	3/8/2018 10:04 AM
36	Hawiiian print lab coats please?	3/7/2018 10:54 AM
37	I love this course and the instructors! This is my favorite class thus far!	3/7/2018 10:16 AM
38	I really enjoy the math 60 online program	3/5/2018 12:03 PM
39	No comment.	3/2/2018 6:56 PM
40	N/A	3/1/2018 12:06 PM
41	It's overall good	2/28/2018 7:43 PM
42	Over good program	2/28/2018 7:42 PM
43	I like it.	2/28/2018 7:42 PM
44	:)	2/28/2018 7:41 PM
45	This online course I am currently taking is by far one of my favorites. The online course provides an abundance of materials needed for me to be successful in my studies, from tutorials to online graphing calculator use (which by the way saved me about \$200) online tutors, online step by step help with problem solving, help from my instructor without having to leave my own home, and so much more. Professor Jackson Ng has made my school work load less stressful, he is extremely helpful and patient when it comes to helping me with my math and worked with me when I transferred late into his online course. I was able to catch up with everyone else within a week and a half. The best statistics professor on campus.	2/28/2018 1:22 PM

46	It is good.	2/28/2018 10:57 AM 3/1/2018 3:34 PM
55	Class is online. It is very hard to take an online math class, but I had no other choice because there was not an evening class available to me.	
56	I have no complaints of the facilities offered.	3/1/2018 12:06 PM
57	I am taking this course online	3/1/2018 10:22 AM
58	I'm taking this course online there fore there is no physical classroom to worry about all of these things.	3/1/2018 8:40 AM

59	My course is online 2/28/2018 9:29 PM
60	Program is good 2/28/2018 7:42 PM
61	All chairs, desks, and lights are fine. 2/28/2018 7:42 PM
62	Math is cool 2/28/2018 7:41 PM
63	online course 2/28/2018 7:17 PM
64	I am currently enrolled in an online course 2/28/2018 6:32 PM
65	the bathrooms at the college could be a little bit cleaner 2/28/2018 1:22 PM
66	It is good.