AS-T Degree in Mathematics 2.0

About the Program

Program Goal: Transfer
GE Pattern(s): Cal-GETC
Program Code: 31953.31AS-T

Students completing Associate Degrees for Transfer are guaranteed admission to the CSU system. Please see the beginning of the "Academic Programs" section for details.

The degree is designed to prepare students for upper division study in Mathematics and related disciplines. The role of Mathematics is vital and growing, providing solutions to problems in a wide range of fields. Mathematics is a study in its own right. It is also an essential tool for expressing and understanding ideas in the sciences: social, biological, physical, behavioral, and management. As a result, employment opportunities for Math Majors have been expanding in recent years. To begin this degree students must either have completed the prerequisites for Math 30 (Calculus 1) which include Trigonometry and College Algebra, or receive a qualifying placement on the CAP tool.

Mathematics graduates at the bachelor's level are qualified to pursue a career in fields such as mathematics, engineering, statistics, operations research, actuarial science, business management, law enforcement, military science, government, and education. They also frequently enter graduate programs to pursue advanced degrees in Mathematics or related majors.

Program Learning Outcome(s):
Upon successful completion of the program, the student will be able to:

1. Define, understand, and apply concepts of limits, differentiation, and integration to authentic problems.
2. Apply methods of matrix transformations to solve both practical and theoretical problems.
3. Determine whether a theorem or definition applies in a given situation and use it appropriately.
4. Demonstrate good problem-solving habits including estimating solutions and rejecting unreasonable results.
5. Demonstrate the ability to use symbolic, graphical, numerical, and written representations of mathematical ideas.

Required courses:		19.00-21.00
MATH 31	Analytic Geometry and Calculus II	4.00
MATH 32	Analytic Geometry and Calculus III	4.00
MATH 40	Differential Equations	4.00
MATH 42	Linear Algebra	4.00
Select one:		5.00
MATH 30	Analytic Geometry and Calculus I	5.00
MATH 30s	Analytic Geometry and Calculus I with Support	5.00
~~*Select 6 units minimum from the lists below, with at least 3 units from List A:*~~		6.00-8.00
~~*List A (Select one to two):*~~		3.00-4.00
~~MATH 40~~	~~Differential Equations~~	~~4.00~~
~~MATH 42~~	~~Linear Algebra~~	~~3.00~~
List B (Select one):		3.00-4.00
CSCI 20	Programming and Algorithms I	3.00
PHYS 41	Physics for Scientists and Engineers I	4.00
CSCI 4	Introduction to Programming	4.00
~~STAT C1000~~	~~Introduction to Statistics~~	~~4.00~~ ~~4.00~~
~~OR~~		
~~STAT C1000E~~	~~Introduction to Statistics~~	4.00

Total: ~~19.00-21.00~~ 23.00-24.00

Suggested Program Map (Cal-GETC)

Required courses: **Units:** 60.00-68.00

Term 1		14.00
Select one: Meets Area 2		5.00
MATH 30	Analytic Geometry and Calculus I	5.00
Prerequisite: MATH 20 and MATH 26 or MATH 20 and MATH 26s, MATH 28 or MATH 28s, or college-level Pre-calculus or equivalent.		
MATH 30s	Analytic Geometry and Calculus I with Support	5.00
Prerequisite: MATH 20 and MATH 26 or MATH 20 and MATH 26s, MATH 28 or MATH 28s, or college-level Pre-calculus or equivalent.		
Area 1C Choice (See GE Guide)		3.00
Area 4 Choice (See GE Guide)		3.00

Taking POLS C1000 or POS 12 is recommended to meet the US-2 graduation requirement for CSU/UC.

Elective (any course numbered 1-99 or C1000-C1999) Only necessary if the 60 units needed to graduate have not been completed. Consider taking a Cal-GETC General Education course. Visit www.assist.org to see options.		3.00
Term 2		13.00-14.00
MATH 31 Meets Area 2.	Analytic Geometry and Calculus II	4.00
Area 1A Choice (See GE Guide)		3.00-4.00
Area 1B Choice (See GE Guide)		3.00
Area 3A Choice (See GE Guide)		3.00
Term 3		16.00-21.00
MATH 32 Meets Area 2.	Analytic Geometry and Calculus III	4.00
List A: (Select one): Meets Area 2		3.00-4.00
MATH 40	Differential Equations	4.00
MATH 42	Linear Algebra	3.00
List B (Select one or any List A course not already used):		3.00-4.00
CSCI 20	Programming and Algorithms I	3.00
PHYS 41 Meets Area 5A/5C.	Physics for Scientists and Engineers I	4.00
STAT C1000 Meets Area 2.	Introduction to Statistics	4.00
STAT C1000E Meets Area 2.	Introduction to Statistics	4.00
Area 3B Choice (See GE Guide) Taking ECON 20, HIST 8, HIST 10, HIST 18, or HIST 26 is recommended to meet the US-1 graduation requirement for CSU/UC.		3.00-4.00
Area 5A/5C Choice (See GE Guide) Only necessary if PHYS 41 not taken in List B.		3.00-5.00
Term 4		17.00-19.00
Area 4 Choice (See GE Guide)		3.00
Area 5B/5C Choice (See GE Guide) Must have 5C Lab component if not taken in 5A/5C.		3.00-5.00
Area 6 Choice (See GE Guide)		3.00
Elective (any course numbered 1-99 or C1000-C1999) Only necessary if the 60 units needed to graduate have not been completed. Consider taking a Cal-GETC General Education course. Visit www.assist.org to see options.		8.00

Total: 60.00-68.00

Program Map: Cal-GETC

Term 1

GE/Major List	Course	Units
Area 2	Math 30 or 30s	5
Area 1A	Engl C1000 or C1000E	4
Area 4	Choice (first discipline)	3
Area 1C	Choice	3
Term units		**15**

Term 2

GE/Major List	Course	Units
	Math 31	4
Area 1B	Choice	3
Area 3A	Choice	3
	Math 42	3
Elective	Choice	3
Term units		**16**

Term 3

GE/Major List	Course	
List A	CSCI 4 or 20 or PHYS 41	3
Area 5A or Elective	Select 5A if PHYS 41 not taken above	3
	Math 32	4
Elective	Choice	2
Area 4	Choice (second discipline)	3
Term units		**15**

Term 4

GE/Major List	Course	
Area 5B (+5C if needed)	Choice	4
Area 6	Choice	3
Area 3B	Choice	3
	Math 40	4
Term units		**14**

Total Program Units	**60**

ADT Submission Form for Mathematics
CCC Major or Area of Emphasis: Mathematics
TOP Code: 1701.00
CSU and UC Major(s): Mathematics
Total Units: 20-22 *(all units are minimum semester units)*

ADT Submission Form # 2001
Rev. 5: 02/01/25

In the four columns to the right under the **College Program Requirements**, enter the college's course identifier, title and the number of units comparable to the course indicated for the form. If the course may be double-counted with Cal-GETC, enter the GE Area to which the course is articulated. To review the GE Areas and associated unit requirements, please go to Chancellor's Office Academic Affairs page, RESOURCE section located at: https://www.cccco.edu/About-Us/Chancellors-Office/Divisions/Educational-Services-and-Support/What-we-do/Curriculum-and- Instruction-Unit/Templates-For-Approved-Transfer-Model-Curriculum

or the ASSIST website: https://www.assist.org/.

The units indicated in the template are the **minimum** semester units required for the prescribed course or list. All courses must be CSU and UC transferable. ***All courses with an identified C-ID Descriptor must be submitted to C-ID prior to submission of the Associate Degree for Transfer (ADT) proposal to the Chancellor's Office.***

Where no **C-ID Descriptor** is indicated, discipline faculty should compare their existing course to the example course(s) provided in the form at:

http://www.c-id.net/degreereview.html

Attach the appropriate ASSIST documentation as follows:

- *Articulation Agreement by Major* (***AAM***) demonstrating lower division preparation in the major at a CSU or UC;
- *UC Transfer Course Agreement* (***UCTCA***) for the transfer courses; and/or,
- *Cal-GETC Certification Course List by Area* (***GECC***).

The acronyms ***AAM, UCTCA,*** and ***GECC*** will appear in **C-ID Descriptor** column directly next to the course to indicate which report will need to be attached to the proposal to support the course's inclusion in the transfer degree. To access ASSIST, please go to http://www.assist.org.

Associate in Science in Mathematics for Transfer Degree
College Name: Butte College

TRANSFER MODEL CURRICULUM (TMC)		COLLEGE PROGRAM REQUIREMENTS			
Course Title (units)	**C-ID Descriptor**	**Course ID**	**Course Title**	**Units**	**Cal-GETC**
REQUIRED CORE: (17-18 units)					
Single Variable Calculus Sequence (8)	MATH 900S	MATH 30	Analytic Geometry and Calculus I	5	Area 2
OR	**OR**	or			
Single Variable Calculus I – Early Transcendentals (4)	MATH 210	MATH 30S	Analytic Geometry and Calculus I with Support	5	Area 2
AND	**AND**				
Single Variable Calculus II – Early Transcendentals (4)	MATH 220	and			
OR	**OR**	MATH 31	Analytic Geometry and Calculus II	4	Area 2
Single Variable Calculus I – Late Transcendentals (4)	MATH 211				
AND	**AND**				
Single Variable Calculus II – Late Transcendentals (4)	MATH 221				

A11Y 2/18/25

TRANSFER MODEL CURRICULUM (TMC)		COLLEGE PROGRAM REQUIREMENTS			
Course Title (units)	**C-ID Descriptor**	**Course ID**	**Course Title**	**Units**	**Cal-GETC**
Multivariable Calculus (4)	MATH 230	MATH 32	Analytic Geometry and Calculus III	4	Area 2
Ordinary Differential Equations (3) **AND** Introduction to Linear Algebra (3) **OR** Differential Equations and Linear Algebra (5)	MATH 240 **AND** MATH 250 **OR** MATH 910S	MATH 40 and MATH 42	Differential Equations Linear Algebra	4 3	Area 2 Area 2
List A: Select one (3-4 units)					
Programming Concepts and Methodologies I (3) **OR** Any Introductory Programming Course such as C++, Python, and such that is articulated for transfer for the major	COMP 122 **OR** *AAM*	CSCI 20 or CSCI 4	Programming and Algorithms I Introduction to Programming	3 3	
Calculus-based Physics for Scientists and Engineers: A (4)	PHYS 205	PHYS 41	Physics for Scientists and Engineers I	4	Area 5A+5C
Total Units for the Major:	**20-22**		**Total Units for the Major:**	23-24	
			Total Units that may be double-counted (*The transfer GE Area limits must not be exceeded*)		3-7
			General Education (Cal-GETC) Units		**34**
			Elective (CSU Transferable) Units		5-10
			Total Degree Units (maximum)		**60**

Application for Program Exemption from Graduation Requirement

To receive a program exemption, the program owners must initiate a request for a graduation requirement exemption to the curriculum committee for approval. *Note: If a course that meets the graduation requirement and exists within an academic program it shall double-count as both a program course and a graduation requirement and does not constitute an exemption.*

Program Name: Agriculture Science **Submitted by:** Jennifer Charles-Tolley **Date:** 5/14/25

Department Chair: Rick Wittsell **Dean:** Don Robinson

Enter the names of the Chair/Dean who have approved of this proposal.
You are certifying that the chair/dean approve and that all faculty members in the program have discussed this proposal.

Per the Local Graduation Requirements Guidelines document, students are required to complete a minimum of 2 units from any combination of the following areas: • Self-integration • Physical Education Activity • CTE Pathways Exploratory Courses. A program can apply for an exemption if aspects of self-integration, physical education, or career exploration are integrated within their core curriculum, making additional courses redundant. This action should be considered carefully, with the aim of maintaining the integrity and objectives of the overall educational experience.

1. Check the graduation requirement area being waived:

☐ **Self-Integration**

Personal Development: Courses should focus on enhancing students' self-awareness, emotional intelligence, and personal growth strategies to increase the likelihood of success in achieving educational and career goals. This requirement is designed to equip learners for lifelong understanding and development of themselves as integrated physiological, social, and psychological beings. • College Success Skills: include topics such as student success strategies, human behavior, sexuality, nutrition, physical and mental health, stress management, information literacy, social relationships and relationships with the environment, as well as avenues for lifelong learning.

☐ **Physical Education Activity**

Physical Fitness: Courses must promote physical health through activities that improve strength, flexibility, endurance, and overall fitness. • Wellness Education: Incorporate principles of healthy living, nutrition, and wellness practices. • Skill Development: Offer opportunities for students to learn and improve specific physical skills or sports.

■ **CTE Pathways Exploratory**

Comprehensive Career Coverage: overview of various career opportunities within specific industries or sectors or across specific sectors served by programs offered at Bute College. Curriculum should be aligned with current industry standards and trends and is designed to help students make informed decisions about potential career paths. • Skill Development and Application: Emphasize critical thinking, problem-solving, and operational skills relevant to the intended span of careers, supported by practical, hands-on learning experiences. This could include work experience courses. • Career Planning Resources: Include guest speakers, career planning tools, and guidance in developing personalized career action plans. • Courses must be in a CTE TOP code

2. Explain how this exemption demonstrates that an aggregate minimum of 102 total student learning hours is devoted to topics, concepts, or skills listed in the criteria. Include how the area is met across numerous course outlines or as a small fraction of a high unit course as are found in the academies.

The AGS program through course requirements highlight potential career paths by teaching current industry standards and trends such as planning, skill development, critical-thinking, operational skills, and hands-on experiences. Career planning resources are also included in the curriculum such as guest speakers, career planning tools, and guidance with career action plans. Please refer to the attached documentation for a summation of student learning hours that exceed the 102 minimum.

Curriculum Committee Chair: _____ Date Approved: _____

Course Num	Program	Title	Units	Unit Hours	SL Hours	Criteria
AB-20	Required	Careers in Agriculture, Environmental Science and Natural Resources	1	51	51	Career Planning Resources
AGS-20	Required	Plant Science	3	153	50	Skill Development and Application
AGS-30	Required	Ecology of Insect and Disease Management	3	153	50	Skill Development and Application
AGS-50	Required	General Soils	4	204	100	Skill Development and Application
AGS-99	Required	Work Experience-AGS	0.5-8	102	102	Skill Development and Application
AGS-10	Option	World Food and Hunger Issues	3	153	NA	
AGS-40	Option	Introduction to Animal Science	4	204	100	Skill Development and Application
AGS-45	Option	Feeds and Feeding	3	153	50	Skill Development and Application
AGS-75	Option	Introduction to Agricultural Education	3	153	50	Skill Development and Application
AGS-51	Not in Program	Fertilizers and Plant Nutrition	3	153	50	Skill Development and Application

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Program Name: AS in Environmental Horticulture **Submitted by:** Rick Wittsell **Date:** 5/14/25

Department Chair: Rick Wittsell **Dean:** Don Robinson

Enter the names of the Chair/Dean who have approved of this proposal.

You are certifying that the chair/dean approve and that all faculty members in the program have discussed this proposal.

Per the Local Graduation Requirements Guidelines document, students are required to complete a minimum of 2 units from any combination of the following areas: • Self-integration • Physical Education Activity • CTE Pathways Exploratory Courses. A program can apply for an exemption if aspects of self-integration, physical education, or career exploration are integrated within their core curriculum, making additional courses redundant. This action should be considered carefully, with the aim of maintaining the integrity and objectives of the overall educational experience.

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2. Explain how this exemption demonstrates that an aggregate minimum of 102 total student learning hours is devoted to topics, concepts, or skills listed in the criteria. Include how the area is met across numerous course outlines or as a small fraction of a high unit course as are found in the academies.

Overview

This submission demonstrates that the Environmental Horticulture program at Butte College meets the exemption requirement through an aggregate minimum of 102 total student learning hours devoted to instruction in topics, concepts, and skills listed in the applicable criteria. Instruction is provided across multiple courses in the program and is not limited to a single course or academy-style format.

Student Learning Breakdown

EH 20 – Introduction to Environmental Horticulture 3.0 ~54 hrs

Overview of the horticulture industry, plant science, environmental impact.

EH 22 – Landscape Construction: 3.0 ~54 hrs
Pruning, irrigation systems, landscape tools and safety
EH 23 – Fall Plant Identification: 3.0 ~54 hrs
Botanical terminology, species identification, landscape use.
EH 24 - Spring Plant Identification: 3.0 ~54 hrs
Botanical terminology, species identification, landscape use.
AGS 50 – General Soils: 3.0 ~54 hrs
Soil chemistry, soil health, nutrient management.
EH 60 – Principals of Integrated Pest Management; 3.0 ~54 hrs
Integrated Pest Management (IPM), pesticide safety, environmental regulations.
Total Estimated Student Learning Hours: ~270+ hours
(Note: Not all courses may be required in every certificate or degree path; however, the exemption requirement of 102 hours is met or exceeded through the required core coursework.)
Criteria Coverage Across Multiple Course Outlines
The Environmental Horticulture program addresses the required topics across multiple courses rather than concentrating all instruction in a single course. This curriculum design supports:

Progressive, skill-based learning

Reinforcement of legal, scientific, and safety-related content

Practical application in laboratory, greenhouse, and field settings

Instruction aligned with exemption criteria—such as safety, plant science, pest management, water use, landscape tools, environmental regulations, and soil science—is delivered consistently throughout the program.
Comparable Model to Academies
While the Environmental Horticulture program does not follow a traditional academy model, it achieves the same educational objectives through a distributed approach:

Multiple required courses collectively exceed the 102-hour requirement

Laboratory and field-intensive courses offer hands-on training and demonstration of competency

Course content is aligned with industry practices and state safety/environmental standards

This structure provides a robust and interdisciplinary approach, mirroring the effectiveness of academy-style instruction.
robust and interdisciplinary approach, mirroring the effectiveness of academy-style instruction.

Conclusion
The Butte College Environmental Horticulture program meets and exceeds the exemption requirement by providing more than 102 student learning hours focused on topics and skills that align with applicable criteria. The instruction is clearly documented across multiple course outlines and prepares students for environmentally responsible and technically proficient careers in the horticulture industry.

Curriculum Committee Chair: _____ Date Approved: _____