AUSTIN PRE-FRESHMAN ENGINEERING PROGRAM 2019



Student and Parent Handbook

Contact Information

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Austin Pre-Freshman Engineering Program (AusPREP) 2019

SITE & PROGRAM INFORMATION

CAMPUS: Huston-Tillotson University (HT) located at 900 Chicon Street, Austin, TX 78702

DATES: AusPREP: June 10 to July 25, 2019 Pre-Algebra Institute: July 1 to July 25, 2019

HOURS: AusPREP will be held Monday through Friday from 8:30 a.m. to 3:15 p.m. Pre-Algebra Institute will be held Monday through Friday from 8:30 a.m. to 12:20 p.m.

FACILITIES

All program activities, except for field trips, will be at HT. AusPREP staff will be available to help with research, projects and homework, if needed. You may be able to use the library and cafeteria. You will hear about other campus privileges at the Parent Orientation and on the first day of classes.

COURSE FOR PRE-ALGEBRA INSTITUTE: (Rising 6th graders only)

Introduction to Algebra: Studies to improve skills in integers, fractions, decimals, ratios, proportions, percentages averages, substituting values, setting up equations, polynomial basics and factoring, linear equations, and exponents.

COURSES FOR FIRST YEAR AUSPREP

Logic and Its Application to Mathematics: Compound statements, truth tables, elementary set theory, Boolean algebra and switching networks.

Introduction to Engineering: Lecture/laboratory class with the following topics: the engineering profession, measurements, simple mechanics, work-energy and engineering design; in-class and laboratory demonstrations of engineering principles; and team designs of bridges, towers, and gliders.

COURSES FOR SECOND YEAR AUSPREP

Introduction to Physics: The student will learn to apply principles of Physics in the laboratory using friction linear track and resistors in series and parallel. A demonstration of mechanics, units and physical quantities, equilibrium of a particle, motion in a strait line, Coulomb's and Ampere's Law.

Algebraic Structures: This course gives a basic knowledge of groups, rings, and fields using system of integers and rational numbers as models, the derivation of algebraic properties of these systems, set theory, and properties of abstract mathematical systems.

COURSES FOR THIRD YEAR AUSPREP

Probability and Statistics: Students will gain an understanding of basic probability theory and models including the binomial, hyper geometric, Poisson, exponential, and normal models. They will also learn how to generate statistical tables and charts as well as measure center and spread for distributions.

Introduction to Computer Science: Introduction to computers; explanation of basic hardware and software applications; solving problems by developing algorithms and using flow charting;

use of an object-oriented programming language.

ALL YEARS

Topics in Problem Solving:

Numerous and varied experiences with problem solving as a method of inquiry and application so that students can use problem solving approaches to investigate and understand mathematical content, formulate problems, develop and apply a variety of strategies to solve problems, verify and interpret results, generalize solutions and strategies to new problem situations, and acquire confidence in using mathematics meaningfully.

Writing: This class concentrates on the writing skills applicable to engineering and science fields. Students will learn to appeal to authority, original research, and logic. This course also reinforces basic writing skills such as purpose and audience, organization and development, revision, editing, style, grammar, and mechanics. Students will also learn to produce clear, persuasive, and efficient technical reports using word processor software and graphics.

Research and Study:

Work on assignments and projects. Consultations/tutoring with instructors and program assistant mentors.

Career Awareness:

Invited speakers from local and state high technology industries will discuss professional engineering and science opportunities, their own work, and a biography of their professional development; special technical presentations; some speakers will counsel on such topics as resume preparation, college preparatory expectations, college financial aid, test taking techniques and leadership skills.

PREP GRADING SCALE

A+	100.00 - 98(Outstanding)		С	84.99 - 75.00
А	97.99-93.00		D	74.99 - 69.50
В	92.99 - 85.00		F	BELOW 69.49

* Any student with a final grade of 69.5 or greater has successfully completed the program.

Final grades will be computed using the following weighting:

 $\frac{\text{First Year}}{\text{Logic} = 30\%}$ Problem Solving = 25%
Engineering = 25%
Journal I = 20%

 $\frac{\text{Second Year}}{\text{Algebraic Structures} = 30\%}$ Problem Solving = 25%
Introduction to Physics = 25%
Journal II = 20%

<u>Third Year</u> Probability & Statistics = 25%Problem Solving = 25%Computer Science = 25%Technical Writing = 25%

PARENT ORIENTATION

A parent orientation meeting will be held on the HT campus in Dickey-Lawless, Room 200 on **May 15, 2019 from 4:00-6:00 p.m.** If you cannot make this session, contact the program director at 512.505.6479 before May 15th to make other arrangements.

TRANSPORTATION

Participants are responsible for their own transportation to and from AusPREP and Pre-Algebra.

If you have any questions or concerns, please email <u>ausprep@htu.edu</u> or call 512.505.6479



AusPREP Daily Schedule June 10th – July 25th

8:00-8:25am — Arrival

8:30-9:25am — Class Period 1

9:30-10:25am — Class Period 2

10:30-11:25am — Career Awareness Speakers

11:30-12:20pm — Lunch Y1 **11:30-12:25pm** — Class Period 3

12:25-1:20pm — Class Period **12:30-1:20pm** — Lunch Y2, Y3

1:25-2:20pm — Class Period 4

2:20-3:15pm — Class Period 5 (Research & Study)

3:15-3:45pm — Dismissal

Pre-Algebra Daily Schedule July 1st – July 25th

8:00-8:25am — Arrival

8:30-10:25am — Class Period

10:30-11:25am — Career Awareness Speakers

11:30-12:20pm — Lunch

12:20-12:45pm — Dismissal



AusPREP Map



- > Drop-off and pick-up location is on the north side of the Student Union.
- > Enter and exit out of the Chicon Street gate.
- > All AusPrEP programming will take place in Dickey-Lawless building.
- Lunch is held in the Student Union.

2019 AusPREP POLICIES & REGULATIONS

- 1. Students must attend all classes, unless excused by the Site Director.
- 2. Students must be on time for daily roll call and classes. If a student is absent, tardy, or requesting an early dismissal, the parent or guardian must notify the assigned AusPREP site by email to the Site Director or calling the AusPREP office **24 hours** in advance to obtain an **Excused Absence**. Students must provide a written note from the parent or a physician upon returning to the AusPREP program. Students with **5 tardies** and/or **early dismissals**, or a **combination of absences/tardiness/early dismissals equivalent to 5 days of instruction** may be asked to resign from the program.
- 3. Excused absences are approved by the Site Director. A maximum of five excused absences is allowed for the AusPREP program, and a maximum of three for the Pre-Algebra Institute. On the sixth (fourth, absence for Pre-Algebra), the student will be dismissed. Students are reminded that it is difficult to make up work after the second consecutive absence. Unexcused absences are not allowed and will result in dismissal from the program.

Participants are responsible for completing any missed assignments on their own to receive grades. Instructors and Program Assistants are not required to provide additional time and assistance on missed material, but will make efforts as time allows.

- 4. Students must be picked up on-time at the program close daily. The pick-up windows are 3:15-3:45pm daily for AusPREP and 12:20-12:45pm for Pre-Algebra. AusPREP staff must be notified in advance if a student will be carpooling with another participant. Students will not be allowed to leave with unapproved carpool arrangement. A maximum of three tardy pick-ups will be allowed, and students will be dismissed from the program on the fourth occurrence.
- 5. Students must attend the graduation ceremony to complete the AusPREP program and receive a certificate for their time in AusPREP. If absent within

the excused absences of five (5) days on the closing day, then he/she will be allowed to be promoted, but will not receive a certificate. The student remains eligible to earn high school elective credit if eligible and desired.

- 6. Students should only bring classroom material and personal care items to campus. AusPREP is not responsible for lost and damaged items. Cell phone use is at the discretion of the site staff, and generally not permitted during class time.
- 7. Fireworks, guns or knives, or any other weapons are strictly prohibited and will result in dismissal from the program.
- 8. Food and drinks are not allowed in the lecture halls, labs or classrooms. Smoking, alcohol, chewing gum, and gambling are not permitted.
- 9. Unruly, unsafe or inappropriate behavior is grounds for dismissal.
- 10. Communication, including by social media, between minors and staff/counselors outside of official communications of the program for minors is prohibited.
- 11. Site Director may add additional rules as needed.

MEDICATION

There are many legal issues involved in a student taking prescribed medication while at AusPREP. Generally, AusPREP have access to the Sandra Joy Anderson Health and Wellness Center on campus; However. it is much easier and safer for program administration, if arrangements can be made for the student to schedule taking their medication before or after attending AusPREP. When this is not possible and there is access to a health center, the following steps MUST be taken:

- 1. The Parental Permission Form MUST be completed and returned.
- 2. The *Medication Description Form* MUST be completed by the attending physician and returned to the AusPREP program Site Director. This details times, dosages, potential side effects, etc.
- 3. The parent/guardian must personally deliver the medication to the AusPREP program Site Director.
- 4. AusPREP staff must be informed of procedures for administering any medication, and required documentation maintained.
- 5. All physician directions, including any reporting requirements, MUST be strictly adhered to.
- 6. The parent/guardian should be informed immediately, if any problems or concerns arise.

If a site does not have access to a health center, the parent/guardian must inform the site director to allow for the parent/guardian to administer either non- prescription or prescription medication. Students are allowed to carry non- prescription nor prescription medication while at AusPREP at the discretion of the Program Director.

FREQUENTLY ASKED QUESTIONS

What if ...

...you need to speak to a PREP administrator? Tell your Program Assistant (PA).

...you are late to PREP? Go to your designated classroom room according to the schedule provided to you on the first day of the program, immediately find your PA, and tell them that you have arrived.

...you have found a book or personal item that is not yours? Turn it in to your PA.

...you need to call your parents? Ask your PA.

...you will be absent? Refer to "Regulations."

...anyone on campus exhibits behavior that is inappropriate or makes you feel uncomfortable? Find and tell any AusPREP staff member immediately.

...you have lost something? Tell your PA immediately.

...you want advice about personal problems, test anxiety, or peer pressure? Speak with any AusPREP staff member.

...you want to withdraw from AusPREP? Talk to your PA and the Site Director, or have your parent call the AusPREP office (512.505.6479) and an administrator will assist to resolve the situation.

In case of any situation not mentioned above, the communication procedure that must be followed between the students and AusPREP staff is to first speak to the Program Assistant and second to the Site Director.

PROGRAM LEARNING GOALS

AusPREP is an intellectually demanding, mathematics-based, academic enrichment program for middle and high school students. Its program is presented in seven (7) week sessions over the course of three summers, for a total of twenty-eight weeks. Pre-Algebra Institute adds an additional four-week, half-day session, and does not provide for the possibility of high school credit, but better prepares students for advanced mathematics coursework in middle school.

The intent of AusPREP is to provide students who have demonstrated mathematical ability (through academic performance, participation in competitions and teacher/counselor recommendations) with the academic and intellectual competencies to succeed in high school, college preparation courses; in college programs in mathematics, science and engineering; and to facilitate their interest in and commitment to pursuing careers in mathematics, science and engineering. It is targeted toward, but not limited to, students who are members of minority groups or female, i.e., groups who have traditionally been underrepresented in the professions of mathematics, science and engineering.

The curriculum is designed to strengthen the students' ability to problem solve, reason, conjecture, and apply mathematical knowledge logically and systematically. It stresses the development of critical thinking, abstract reasoning, and systematic analysis. Through an integrated and hands-on approach, it demonstrates the application of mathematics to diverse disciplines, particularly to the fields of science, computer science, and engineering, and to a wide range of career opportunities. Students not only develop their basic mathematical skills and knowledge, but also learn to communicate and reason mathematically - both orally and in writing. In addition, through their experiences of success in a rigorous academic program, they learn that hard work, perseverance and commitment result in meaningful knowledge and pride in accomplishment.

Over the three-year period, students take a series of classes. The foundation of these is mathematical logic and reasoning; this includes an intentional and consistent emphasis on utilization and problem solving. Specific course content is enhanced by experiences designed to promote a clear understanding of how mathematical concepts and procedures are applied, particularly in the fields of engineering, computer science and science. Integration of course material is formally built into the program through special events and projects. These challenge the students' critical and divergent thinking skills and allow for the innovative application of mathematical ideas. In addition, guest speakers from a variety of career fields in mathematics, science and engineering discuss how mathematical, science and engineering concepts are actually utilize within their professions. To summarize, the emphasis throughout is on developing mathematical thinking ability, as well as an understanding of its usefulness and significance.

The course curricula for AusPREP have been updated in 2019. The Essential Knowledge and skills per year are detailed below.

Introduction for all program years

- (1) Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.
- (2) The Science, Technology, Engineering, and Mathematics (STEM) Career Cluster focuses on planning, managing, and providing scientific research and professional and technical services, including laboratory and testing services, and research and development services.
- (3) TexPREP I coursework includes Logic and Its Applications to Mathematics, Engineering Foundations, Topics in Problem Solving, Research and Study, and College and Career Awareness seminar components. Systems thinking/system dynamics is integrated throughout the curriculum. Students will use a variety of computer hardware and software to complete assignments, projects, and develop coding skills. Students will work collaboratively during inquiry-, problem-, projectand/or challenge-based educational experiences. Oral and written communication skills in STEM

are emphasized.

- (4) Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.
- (5) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.

Knowledge and skills.

- (1) <u>STEM Process Standards.</u> The student engages in inquiry-, problem-, project- and/or challengebased educational experiences to master content. The student is expected to:
 - (A) collaborate and include the ideas of others to explain or justify the complexities of an issue or problem;
 - (B) create timelines, organize ideas and document findings, such as with the use of an engineering journal;
 - (C) accept constructive criticism and revise explanation of views and solutions when valid evidence warrants;
 - (D) self-monitor learning needs and seek assistance when necessary; and
 - (E) communicate and share new and innovative solutions verbally, in writing, and using multiple media outlets.
- (2) <u>STEM Process Standards</u>. The student critically adapts to challenges by systematically applying an engineering design process. The student is expected to:
 - (A) apply a problem solving model as a method of inquiry and application;
 - (B) investigate problem scenarios, identify problems or constraints, and provide solutions;
 - (C) develop and apply multiple strategies to solve problems;
 - (D) design and build test models or prototypes including the use of technology;
 - (E) verify and interpret results of simulations and make revisions or adjustments as needed.
- (3) <u>STEM Process Standards.</u> The student justifies engineering principles by communicating mathematical and scientific reasoning and problem solving. The student is expected to:
 - (A) gather evidence and data systematically to support arguments, findings or lines of reasoning;
 - (B) apply mathematics and scientific principles to problems, including numerical calculations, simulations, and computer programming;
 - (C) construct well-reasoned arguments to explain phenomena, validate conjectures, or support positions;
 - (D) consider arguments and conclusions of self and others;
 - (E) support or modify claims, with evidence, based on the results of an inquiry; and
 - (F) evaluate sources for quality of content, validity, credibility, and relevance.
- (4) <u>STEM Process Standards</u>. The student researches and exhibits employability skills as required by STEM business and industry. The student is expected to:
 - (A) demonstrate verbal, nonverbal, written, and electronic communication skills that provide clarity to an audience; and
 - (B) research a variety of STEM professions and describe the pathway, including postsecondary education opportunities, that lead to a profession;
 - (C) establish education and career goals using self-awareness of interests and talents and research of educational and career information;
 - (D) explain and apply ethics and standards of professionalism when working alone and when working collaborating with others; and
 - (E) demonstrate productive work habits and attitudes when working alone and when collaborating with others.

TexPREP I (Year 1)

(a) <u>General requirements.</u> This course is recommended for students in Grades 9-10. Students shall be awarded one credit for successful completion of this course.

- (1) <u>Logic and Its Applications to Mathematics</u>. The student explores the applications of formal logic to mathematics. The student is expected to:
 - (A) develop and use clear and precise definitions for mathematical terms and expressions;
 - (B) distinguish between different types of sentences such as statements, exclamations, commands, and interrogatives;
 - (C) translate compound statements, arguments, and quantified statements from sentence form to appropriate symbolic notation and vice-versa;
 - (D) interpret the truthfulness and falsehood of compound statements, including inverse, converse, contrapositive, and bi-conditional statements;
 - (E) construct proofs using truth tables to prove two statements are logically equivalent;
 - (F) construct proofs, using truth tables and two-column proofs, to prove the validity of arguments involving traditional statements or quantified statements;
 - (G) apply models of classic arguments such as Modus Ponens, Modus Tollens, and Hypothetical Syllogism to prove the validity of arguments;
 - (H) apply concepts of set theory including sets, subsets, unions, intersections, and complements;
 - (I) correlate the set concepts of complement, union, intersection, and set subtraction to the logical concepts of negation, disjunction, conjunction, and conditionals; and
 - (J) apply set counting techniques to determine the cardinality of sets such as negations, disjunctions, conjunctions, and conditionals using Venn diagrams.
- (2) <u>Engineering Foundations</u>. The student uses their math, science, technology, and systems thinking skills to solve engineering problems. The student is expected to:
 - (A) describe the characteristics of a system, including the systems' parts, how they are connected, the behavior of a system, and the implicit/explicit goal(s) of the system;
 - (B) develop problem statements using a systems thinking approach;
 - (C) illustrate technical drawings for assembly and building instructions;
 - (D) apply Boolean Algebra and switching networks in a design task;
 - (E) discuss various topics relating to electricity and magnetism, including Coulomb's Law, electric fields, potential, capacitance, current, resistance, electromotive force, direct current circuit, and magnetic fields;
 - (F) design and construct electric circuit elements connected in both series and parallel combinations; and
 - (G) calculate current, potential difference, resistance, and power for the electric circuit elements.
- (3) <u>Topics in Problem Solving.</u> The student establishes an understanding of systems thinking terminology, concepts, processes, methods, language and tools. The student is expected to:
 - (A) draw conclusions, or challenge the conclusions, of others applying the systems thinking tool, Ladder of Inference;
 - (B) collect evidence to support interpretation of system behavior;
 - (C) graph relationships, interpreting the rate of change of the line that models that relationship;
 - (D) identify functions using sets of ordered pairs, tables, mappings and graphs;
 - (E) determine whether relations represented verbally, tabularly, graphically and symbolically define a function;
 - (F) distinguish between proportional and non-proportional situations using tables, graphs, and equations;
 - (G) determine the domain and range of functions in real-world situations; and
 - (H) describe and model solutions using systems thinking tools including behavior over time graphs, connection circles, causal loop diagrams, and stock/flow maps.

TexPREP II (Year 2)

- (a) <u>General requirements.</u> This course is recommended for students in Grades 9-11. Recommended prerequisite: TexPREP I. Students shall be awarded one credit for successful completion of this course.
 - (1) <u>Algebraic Structures.</u> The student explores abstract algebra. The student is expected to:
 - (A) classify and categorize numbers into sets such as natural numbers, whole numbers, integers, rational numbers, real numbers, and congruence classes;
 - (B) apply properties of union, intersection, and complements of sets to prove relationships between sets;
 - (C) use modulo arithmetic in determining membership in congruence classes;
 - (D) evaluate and solve expressions and equations involving non-traditional mathematical operations, such as $a \Delta b = 2a 3b$;
 - (E) extend the properties of closure, commutativity, associativity, identity, and inverse to non-traditional mathematical operations, such as identifying groups or rings;
 - (F) represent numerical systems in multiple forms such as functionally, graphically, tabularly, and algebraically; and
 - (G) experiment with non-Abelian number systems such as dihedral groups and matrix multiplication, to determine which properties are shared with more traditional number systems.
 - (2) <u>Engineering Physics.</u> The student explores applied physics with a strong emphasis on math and engineering fundamentals with the use of simulations based on system dynamics. The student is expected to:
 - (A) apply knowledge of mathematics, science, engineering, and systems thinking to design and conduct experiments and analyze and interpret data;
 - (B) design a system or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability;
 - (C) generate and interpret graphs and charts describing different types of motion, including the use of real-time technology;
 - (D) describe and analyze motion in one dimension using equations with the concepts of distance, displacement, speed, average velocity, instantaneous velocity, and acceleration;
 - (E) analyze and describe accelerated motion in two dimensions using equations, including projectile and circular examples;
 - (F) calculate the effect of forces on objects, including the law of inertia, the relationship between force and acceleration, and the nature of force pairs between objects;
 - (G) develop and interpret free-body force diagrams; and
 - (H) identify and describe motion relative to different frames of reference.
 - (3) <u>Topics in Problem Solving.</u> The student experiences problem solving as a method of inquiry and application. The student expands their understanding of systems thinking/system dynamics terminology, theories, processes, methods, language and tools. The student is expected to:
 - (A) test and verify solutions using systems thinking tools including behavior over time graphs, connection circles, causal loop diagrams, and stock/flow maps;
 - (B) illustrate and describe the relationship between events, patterns and system behavior using an iceberg model;
 - (C) use existing system dynamics' models for prediction and analysis of 'what if' scenarios;
 - (D) determine reasonable domain and range values for real-world situations, both continuous and discrete;
 - (E) write equations given a table of values, a graph, and a verbal description;
 - (F) write systems of equations of equations given a table of values, a graph, and a verbal description;
 - (G) solve equations, including the use of the distributive property and where variables are

included on both sides; and

(H) evaluate functions, including those expressed in function notation, given one or more elements in their domains.

TexPREP III (Year 3)

- (a) <u>General requirements.</u> This course is recommended for students in Grades 9-12. Recommended prerequisite: TexPREP II. Students shall be awarded one credit for successful completion of this course.
 - (1) <u>Probability and Statistics</u>. The student explores probability and statistics concepts, models, methodology, and applications. The student is expected to:
 - (A) collect, organize, and evaluate data;
 - (B) apply basic probability theory, including counting procedures, addition rule, multiplication rule, and independence;
 - (C) demonstrate knowledge of probability models, including binomial, Poisson, exponential, and normal;
 - (D) demonstrate knowledge of descriptive statistics, including tables and charts, measures of center, and measures of spread;
 - (E) demonstrate knowledge of analytical statistics, including confidence intervals for means and proportions, tests of hypothesis for means and proportions, and simple regression;
 - (F) construct and analyze arguments based on data analysis, using logic, reasoning, and problem-solving techniques; and
 - (G) sort, analyze, and interpret numerical data using statistical software.
 - (2) <u>STEM Technical Writing.</u> The student practices the elements of engineering and scientific writing. The student is expected to:
 - (A) use informal, standard, and technical language appropriately;
 - (B) organize ideas in writing to ensure coherence, logical progression, and support for ideas;
 - (C) collect, analyze, document, and report research clearly, concisely, logically, and ethically;
 - (D) analyze data from research; incorporate it into assigned writing clearly, concisely, and logically; and attribute the source with proper citation as determined by the American Psychological Association (APA) documentation manual, consistent with STEM fields of study;
 - (E) apply technical information and knowledge in practical documents for a variety of situations such as appealing to authority, to the original research data, and to logic;
 - (F) produce clear, persuasive, and efficient technical reports using word processing software and graphic techniques; and
 - (G) report results of statistical studies to a particular audience, including selecting an appropriate presentation format, creating graphical data displays, and interpreting results in terms of the question studied.
 - (3) <u>Topics in Problem Solving</u>. The student experiences problem solving as a method of inquiry and application. The student further expands their understanding of systems thinking/system dynamics modeling, theories, processes, methods, language and tools. The student is expected to:
 - (A) prepare and draft relationships between events, patterns and system behavior using an iceberg model;
 - (B) duplicate an existing system dynamics model for verification of output, such as the behavior of the system.
 - (C) determine and analyze the effects on the graphs of parent functions for specified values or terms such as *a*, *b*, *c*, and *d*;
 - (D) write and represent the domain and range of functions in interval notation, inequalities and set notation;
 - (E) solve, algebraically, systems of equations in two variables; and
 - (F) describe connections between algebra and geometry and use one- and two-dimensional coordinate systems to verify conjectures.

- (4) <u>Computer Science</u>. The student explores the foundational concepts of computer science with a focus on creative problem solving, real-world applications, and coding. The student is expected to:
 - (A) develop and use clear and precise definitions of computer concepts, terms and expressions, including basic hardware, software, and system components;
 - (B) describe the history and evolution of computers and relate these to the capabilities and applications of programming;
 - (C) demonstrate skills in an object-oriented language such as Python, Java, C++, C#,;
 - (D) write a computer program to solve a specified problem;
 - (E) design and create simple graphics program;
 - (F) employ appropriate mathematical and logical concepts in programming;
 - (G) apply the concepts of input, Boolean logic, and program repetition;
 - (H) develop an abstraction when writing a program;
 - (I) develop an algorithm for implementation in a program;
 - (J) write simple code using variables to output and calculate simple arithmetic operations;
 - (K) apply the concepts of creating and using functions, as well as generating random lists and values; and
 - (L) analyze the correctness, usability, functionality, and suitability of computational artifacts.

Component Grade Breakdown

Each component is worth a certain percentage to the final grade. The component breakdown consists of the following:

Year 1	Logic – 30%	G	GRADE SCALE			
	Problem Solving – 25% Journal I – 20%	Below is the scale 100.00 - 98.00	Below is the scale used to calculate all final grades: $100\ 00 - 98\ 00$ A+ (Outstanding)			
Year 2	Algebraic Structures – 30% Physics – 25% Problem Solving – 25% Journal II – 20%	97.99 - 93.00 92.99 - 85.00 84.99 - 75.00 74.99 - 69.50 BELOW 69.50	A B C D F			
Year 3	Probability and Statistics – 25% Computer Science – 25% Problem Solving – 25% Technical Writing – 25%	*Any student with successfully comp	*Any student with a grade of 69.5 or greater has successfully completed the program.)			