College of Science and Tech (SCTC)

Courses

**SCTC 0712. Mathematical Concepts I. 0 Credit Hours.**
The goal of this course is to give students a firm foundation in the topics of intermediate algebra as a basis for subsequent courses in mathematics and other disciplines. Included in this goal is the development and strengthening of one’s skill in interpreting and solving application problems. Intermediate Algebra begins with a presentation of topics of Algebra including use of variables, exponents, order of operations. Further topics include solving linear equations and inequalities, understanding and graphing linear equations in two variables, finding the equation of a line, applying the laws of exponents, performing operations with polynomials, factoring polynomials, and solving polynomial equations. The skill of solving equations will be extended to formulating and solving equations of applied problems. Students will be offered the opportunity to use MyMath Test with instructor support as they work through the course material and will be offered the opportunity to re-take the Math Placement Test upon completion of the course. Note: The fee for this course may be found in the Detailed Class Information, which can be reached from the class schedule listing.

**SCTC 0721. Mathematical Concepts II. 0 Credit Hours.**
This course emphasizes techniques of problem solving using algebraic concepts. This course will prepare students for Pre-calculus by review of multiple algebraic concepts. This course covers polynomial, rational and algebraic expressions, solving linear equations and inequalities, algebra and graphs of quadratic expressions, and an introduction to the concept of a function. Approaches to problem solving will be emphasized. Students will be offered the opportunity to use MyMath Test with instructor support as they work through the course material and will be offered the opportunity to re-take the Math Placement Test upon completion of the course. Note: The fee for this course may be found in the Detailed Class Information, which can be reached from the class schedule listing.

**SCTC 0727. Chemical Concepts. 0 Credit Hours.**
In this course quantitative practices in chemistry will be emphasized. Topics include empirical and molecular formula, reaction quantities, stoichiometry, thermochemistry and gas properties. Core concepts and principles will be reviewed. A significant component of the course will focus on problem solving skills. A discussion of expectation and test taking practices in preparation for General Chemistry will be provided. Note: The fee for this course may be found in the Detailed Class Information, which can be reached from the class schedule listing.

**SCTC 1001. Introduction to Academics in the Sciences. 1 Credit Hour.**
This course is typically offered in Fall.
Preparation for the academic requirements of science curricula, and development of the skills necessary to succeed in college. A guided exploration of potential career opportunities. There will be guest lecturers. NOTE: Registration for this course is restricted to first semester freshman only. This course meets for the first twelve weeks of the semester.

**Class Restrictions:** Must be enrolled in one of the following Classes: Freshman 0 to 29 Credits
**College Restrictions:** Must be enrolled in one of the following Colleges: Science & Technology
**Repeatability:** This course may not be repeated for additional credits.

**SCTC 1189. Step 1: Inquiry Approaches to Teaching. 1 Credit Hour.**
This course is typically offered in Fall and Spring.
This is the first course in the TUteach pedagogy sequence. This course will provide students with an opportunity to explore teaching in science or mathematics as a career; early field experiences in teaching; and an introduction to the theory and practice necessary to prepare and deliver excellent instruction. To obtain first-hand experience with planning and implementing inquiry-based curriculum, students will teach science/mathematics lessons (designed in NSF-funded project) in elementary classrooms in a local school district. Students will attend 1.5 hours of class on campus each week, where they will learn to prepare and deliver excellent science/mathematics lessons. Students, working in teams, will present three lessons in a third, fourth, fifth or sixth grade classroom during the semester. These classrooms are selected both for the diversity of the student body and for the quality of the classroom teacher. Each team of students will have a district classroom teacher and a TUteach master teacher who will work with them to improve their teaching skills as the semester progresses. The district classroom teacher will remain in the classroom at all times and provide immediate feedback on the quality of the instruction. A tuition remission stipend will be paid to those students who successfully complete this course.

**Repeatability:** This course may be repeated for additional credit.

**Pre-requisites:**
MATH 1021 | Minimum Grade of C | May not be taken concurrently
OR MATH 1022 to 4999 | Required Courses: 1 | Minimum Grade of C | May be taken concurrently
OR MC5 Y | May not be taken concurrently
OR MC6 Y | May not be taken concurrently
OR MA03 Y | May not be taken concurrently
OR STAT 1001 | Minimum Grade of C | May not be taken concurrently
OR STAT 1102 | Minimum Grade of C | May not be taken concurrently
OR STAT 1902 | Minimum Grade of C | May not be taken concurrently.
SCTC 1289. Step 2: Inquiry Based Lesson Design with Strategies for English Learners. 1 Credit Hour.
This course is typically offered in Fall & Spring.
This is the second course in the TUteach pedagogy sequence. This course offers students the opportunity to explore science or mathematics teaching as a career, first-hand experience planning inquiry-based curriculum, and an introduction to theory, research and practice in teaching English language learners in the middle grades. Students will explore the philosophies of bilingual and ESL education as well as different program models that address the education of linguistically diverse students. Students attend 1.5 hours of class on campus each week, where they learn to design and deliver inquiry-based lessons with an understanding of how to adapt standards-based lessons for English language learners. Students teach three lessons in middle grade classroom during the semester. Students will also develop cross-cultural competence through interactions with ELLs, teachers and school staff in the middle grades. After Step 2, students can decide whether they want to pursue teacher certification through the TUteach program.
Repeatability: This course may be repeated for additional credit.
Pre-requisites:
SCTC 1189|Minimum Grade of C-|May not be taken concurrently.

SCTC 1301. Problem Solving in Science. 2 Credit Hours.
This course is typically offered in Fall and Summer II.
As a gateway into science majors, this introductory course will show students how to apply critical thinking and build problem solving skills in all science disciplines. We will look at a vast array of actual problems that you will be confronted with in courses in Biology, Chemistry, Computer Science, Geology, Mathematics and Physics. Problem solving processes and techniques that will be beneficial in solving complex and intricate problems that naturally arise in the sciences will be examined. Rote problems designed to give you practice at learning subject matter are straightforward. Actual science takes place, however, in conceptual, non-formulaic problems, which form the essence of the course.
Repeatability: This course may not be repeated for additional credits.
Pre-requisites:
MATH 0701 to 0702 | Required Courses:1 | Minimum Grade of C- | May not be taken concurrently
OR MATH 0800 to 4999 | Required Courses:1 | Minimum Grade of C- | May be taken concurrently
OR MC3 Y | May not be taken concurrently
OR MC4 Y | May not be taken concurrently
OR MC5 Y | May not be taken concurrently
OR MC6 Y | May not be taken concurrently
OR STAT 1001 | Minimum Grade of C- | May not be taken concurrently
OR STAT 1102 | Minimum Grade of C- | May not be taken concurrently
OR STAT 1902 | Minimum Grade of C- | May not be taken concurrently.

SCTC 1385. Community Engagement: Science and Mathematics Tutoring Mentoring and Service. 1 to 3 Credit Hour.
Students, sophomores and above, will apply in a real world setting, teaching, tutoring, mentoring and/or curriculum development skills. Students will work with the instructor to identify a set of background readings on: a) science and math background content, b) populations to be served, particular needs of these populations, and proven approaches to tutoring, mentoring, or developing curriculum for inquiry-based science or mathematics lessons for in-school or out-of-school activities to be offered, and c) the relationship of science to society for the particular placement. After this background research, students will develop a proposal, carry out the teaching/tutoring/mentoring/curriculum development they proposed, and reflect on the efficacy of their project.
Repeatability: This course may not be repeated for additional credits.
SCTC 1389. Step 1 and 2: Inquiry-Based Lesson Design in Science and Mathematics Modified for English Learners. 2 Credit Hours.
This course is typically offered in Fall and Spring. This is the first course in the TTeach pedagogy sequence. This course will provide students with an opportunity to explore teaching in science or mathematics as a career; early field experiences in teaching; and an introduction to the theory and practice necessary to prepare and deliver excellent instruction. Students will attend 3 hours of class on campus each week, where they will learn to prepare and deliver excellent inquiry-based science/mathematics lessons. Each team of students will have a district classroom teacher and a TTeach master teacher who will work with them to improve their teaching skills as the semester progresses. The district classroom teacher will remain in the classroom at all times and provide immediate feedback on the quality of the instruction. Students will become familiar with elementary and middle school environments as well as the instructional needs of English language learners (ELLS) by observing and discussing middle school culture and by teaching lessons to a middle school class that includes ELLs. They will become familiar with exemplary science curricula for the middle school setting. This course also offers students an introduction to theory, research, and practice in teaching English language learners in the middle grades. Lesson plans will be designed using a modified SIOP (Sheltered Instruction Observation Protocol) model, a model teachers use to differentiate instruction for ELLs. As a result, they will gain an understanding of how to adapt standards-based lessons for English language learners. Students will also develop cross-cultural competence through interactions with ELLs, teachers and school staff in the middle grades. As a result of the SCTC 1389 experiences, students generally are able to make a decision as to whether they want to pursue a pathway to teacher certification through the TTeach program. Students will be required to obtain all clearances and background checks needed to work in schools—please see the TTeach advisor or coordinator for details immediately upon registering.
Repeatability: This course may not be repeated for additional credits
Pre-requisites:
MATH 1021 [Minimum Grade of C] May not be taken concurrently
OR MATH 1022 to 4999 [Required Courses: 1] May be taken concurrently
OR MC5 Y [May not be taken concurrently]
OR MC6 Y [May not be taken concurrently]
OR MA03 Y [May not be taken concurrently]
OR STAT 1001 [Minimum Grade of C] May not be taken concurrently
OR STAT 1102 [Minimum Grade of C] May not be taken concurrently
OR STAT 1902 [Minimum Grade of C] May not be taken concurrently.

SCTC 2001. Introduction to Academics in the Sciences for Transfer Students. 1 Credit Hour.
This course introduces new transfer students to the academic requirements of science curricula, and provides guided exploration of the opportunities and resources at Temple University. Topics will include exploring individual strengths, academic majors, potential career paths, obtaining internships, research opportunities, getting involved on campus, and graduate school preparation. Additionally, students will become familiar with the Temple community and offices. The topics covered in this seminar will help transfer students develop and meet short and long term career goals.
Class Restrictions: May not be enrolled in one of the following: Freshman 0 to 29 Credits
Repeatability: This course may not be repeated for additional credits.

SCTC 2101. Medical Imaging Physics - Seeing Through Ourselves. 3 Credit Hours.
From practically the very day x-rays were discovered in 1895, the use of physics-based methods to see inside the body without surgery has helped greatly reduce suffering from disease and injury. Accuracy and certainty of diagnosis have continuously improved, and the effectiveness of treatment can easily be monitored. This course will provide descriptions of the basic physical science behind conventional and modern medical imaging methods. Topics include endoscopy, laser light scattering, ultrasound, conventional and tomographic x-ray imaging, PET and other nuclear medicine methods, and MRI.
Repeatability: This course may not be repeated for additional credits
Pre-requisites:
(CHEM 1022) [Minimum Grade of C] May not be taken concurrently
OR CHEM 1032 [Minimum Grade of C] May not be taken concurrently
OR CHEM 1552 [Minimum Grade of C] May not be taken concurrently
AND (PHYS 1021) [Minimum Grade of C] May not be taken concurrently
OR PHYS 1061 [Minimum Grade of C] May not be taken concurrently
OR PHYS 2021 [Minimum Grade of C] May not be taken concurrently
OR PHYS 2921 [Minimum Grade of C] May not be taken concurrently
OR CIS 2168 [Minimum Grade of C] May not be taken concurrently.

SCTC 3001. History of Science. 3 Credit Hours.
This course is not offered every year.
The first two objectives of this course are to give the students a working knowledge of the broad developments in science since the ancient world and to give them familiarity with the concept of the Scientific Method necessary for understanding areas of science not covered in the course. The ultimate objective is to provide students with the skill to evaluate claims and classify them as scientific or un-scientific. Students will take an inquiry-based approach through readings and discussions and will address both the scientific history and its role in controversial social and moral issues such as pollution, child labor in the Industrial Revolution, weapons in wartime, attitudes toward women, and science and religion. The course will survey the genesis of the Scientific Revolution and go on to examine the work of scientists in the 16th century through today.
Class Restrictions: Must be enrolled in one of the following Classes: Junior 60 to 89 Credits, Senior 90 to 119 Credits, Senior/Fifth Year 120+ Credits
Repeatability: This course may not be repeated for additional credits.
SCTC 3385. Diamond Peer Teachers - Internship I. 1 Credit Hour.
This course is typically offered in Fall and Spring.
The Diamond Peer Teachers Program provides students with a mentored university-level teaching experience in their major. Course requirements include participation in the three-day pre-semester Teaching Institute and regular participation in the Peer Teachers support group throughout the semester. Peer Teachers provide supplemental instruction in first- and second-year courses, promote student engagement, and model successful study habits and academic preparedness for students with whom they work. For Diamond Peer Teachers only.

Repeatability: This course may be repeated for additional credit.

SCTC 3386. Diamond Peer Teachers - Internship II. 1 Credit Hour.
This course is typically offered in Fall and Spring.
The Diamond Peer Teachers Program provides students with a mentored university-level teaching experience in their major. Course requirements include participation in the three-day pre-semester Teaching Institute and regular participation in the Peer Teachers support group throughout the semester. Peer Teachers provide supplemental instruction in first- and second-year courses, promote student engagement, and model successful study habits and academic preparedness for students with whom they work. For Diamond Peer Teachers only.

Repeatability: This course may be repeated for additional credit.

SCTC 4001. Responsible Conduct of Research. 2 Credit Hours.
This course is not offered every year.
The course is designed to expose undergraduate students to the research environment in terms of a research code of conduct and ethical standards. The course is open to senior undergraduate students of all majors with special authorization required. The course has no specific prerequisites and it does not count as a biology major elective. The course will fulfill the requirement for training in responsible conduct of research for students funded by the National Institutes of Health.

Repeatability: This course may not be repeated for additional credits.

SCTC 4321. Entrepreneurship in Science and Technology. 3 Credit Hours.
This course is not offered every year.
The theme of this course is identifying opportunity and application. It will demonstrate that in every area of interest, or course of study, there is an entrepreneurial potential. Students will be given the basic knowledge to pursue their ideas and to understand the steps required to finance, promote, staff, and manage a business. The goal, however, is not establishing an enterprise but rather developing the skills to relate interests and opportunities; and to apply knowledge of a particular field to its commercial possibilities. The course will use case studies from diverse fields and discuss specific entrepreneurial ventures. There will also be guest speakers from industry to discuss their entrepreneurial endeavors.

Class Restrictions: Must be enrolled in one of the following Classes: Junior 60 to 89 Credits, Senior 90 to 119 Credits, Senior/Fifth Year 120+ Credits

Repeatability: This course may not be repeated for additional credits.

SCTC 4351. Paradigms of Scientific Knowledge: Knowledge Discovery from Scientific Data. 3 Credit Hours.
This course is not offered every year.
The goal of this course is to teach science students the necessary skills for knowledge discovery from large collections of data. The course is designed to introduce students to various data mining algorithms and illustrate how they can be applied to real-life knowledge discovery problems in sciences. Case studies will be discussed that illustrate application of data mining systems in biology, chemistry and physics. One emphasis of the course will be in teaching students how to use various data mining software to solve various knowledge discovery problems. Through this course, students will develop abilities in problem solving and critical thinking, both of which are necessary for the practice of data mining. This will be accomplished by demonstrating the practical applications of each presented algorithm, by emphasizing each algorithm's limitations, and by assigning research-like course projects.

Class Restrictions: Must be enrolled in one of the following Classes: Junior 60 to 89 Credits, Senior 90 to 119 Credits, Senior/Fifth Year 120+ Credits

Repeatability: This course may not be repeated for additional credits

Pre-requisites:
CIS 1051 Minimum Grade of C- May not be taken concurrently
OR CIS 1053 Minimum Grade of C- May not be taken concurrently
OR CIS 1056 Minimum Grade of C- May not be taken concurrently
OR CIS 1057 Minimum Grade of C- May not be taken concurrently
OR CIS 1068 Minimum Grade of C- May not be taken concurrently
OR CIS 1073 Minimum Grade of C- May not be taken concurrently.