UT Dallas 2019 Undergraduate Catalog

Natural Sciences

**NATS 1101** Natural Sciences and Mathematics Freshman Seminar (1 semester credit hour) This course is designed to introduce incoming freshmen to the intellectual and cultural environment of the School of Natural Sciences and Mathematics (NS&M). Students will learn about plans of study and career paths for majors in Biology, Chemistry, Physics, Mathematics, Geosciences, and Science and Mathematics Education. Basic study, problem solving and other skills needed to succeed as an NS&M major will be covered. An overview of the connections within the disciplines of Natural Sciences and Mathematics will be presented, as well as their relationship to engineering, medicine and health, and other fields. Required for all first time in college freshmen in NS&M. Corequisite: **UNIV 1010**. (1-1) Y

**NATS 1141** UTeach STEP 1 (1 semester credit hour) Introduction to STEM teaching as a career. Master teachers introduce students to examples of high quality inquiry-based lesson design as well as model various pedagogical concepts and behavior management strategies. Students are also introduced to the portfolio project. Fieldwork consists of two classroom observations plus planning and teaching three inquiry-based lessons to students in grades four to six in local elementary schools. One and one-half class hours a week for one semester; at least five hours of fieldwork a semester are also required. Prerequisites: A university grade point average of at least 2.750 and admission to the UTeach Dallas program by consent of the UTeach advisor. (1-0) S

**NATS 1142** UTeach STEP 1 (1 semester credit hour) Introduction to STEM teaching as a career. Master teachers introduce students to examples of high quality inquiry-based lesson design as well as model various pedagogical concepts and behavior management strategies. Students are also introduced to the portfolio project. Fieldwork consists of two classroom observations plus planning and teaching three inquiry-based lessons to students in grades four to six in local elementary schools. This course meets twice weekly and satisfies the freshman seminar requirement (**NATS 1101**) for freshmen NS&M majors. At least five hours of fieldwork a semester are also required. Prerequisites: A university grade point average of at least 2.750 and admission to the UTeach Dallas program by consent of the UTeach advisor. Corequisite: **UNIV 1010**. (1-0) S

**NATS 1143** UTeach STEP 2 (1 semester credit hour) Continued exploration into STEM teaching as a career. Topics include various teaching methods that are designed to meet instructional goals; use of various technologies; and learner outcomes. Fieldwork consists of classroom observations and teaching three inquiry-based math, science, or computer science lessons in a middle school classroom. One and one-half class hours a week for one semester; at least five hours of fieldwork a semester are also required. Prerequisites: A university grade point average of at least 2.750 and a grade of B- or better in **NATS 1141** and UTeach advisor consent required. (1-0) S

**NATS 1311** The Universe, and Everything Else (3 semester credit hours) A multidisciplinary study of nature expressly designed for those who have chosen not to major in the natural sciences or engineering. Early models of the solar system and the transformation to current models are examined, as are order in the universe, the nature of matter and the planets, sun, and life cycle of stars. The course will be enhanced by frequent demonstrations of the principles underlying the origin and evolution of the universe. (3-0) Y

**NATS 2330** The Basis of Evolution (3 semester credit hours) Wide-ranging discussions of the unifying theory of the origin and modification through time of all organisms. Pertinent history, the fossil record, evolution as concerns the human experience, processes and mechanisms and
a look at the future are major topics. This course is specifically designed for non-majors and may not satisfy degree requirements in the School of Natural Science and Mathematics. (3-0) S

NATS 2333 Energy, Water, and the Environment (3 semester credit hours) An introduction to the impacts that humans have on the environment, with emphasis on impacts resulting from energy and water use. The course is designed for students who are not seeking a technical major and who wish to enhance their use of science and engineering principles and techniques in making decisions affecting both their own use of energy and water and use by the United States and the world. The course includes discussions of ways to ameliorate and/or adapt to the impacts. (3-0) Y

NATS 2V10 Special Topics in Natural Sciences (1-6 semester credit hours) Subject matter will vary from semester to semester. May be repeated for credit as topics vary (9 semester credit hours maximum). Instructor consent required. ([1-6]-0) S

NATS 3301 Contemporary Issues in Marine Science (3 semester credit hours) Contemporary issues in marine science with a focus on the circum-Gulf of Mexico. Case studies are explored utilizing research literature, remote sensing, core analysis, and other means. Topics include estuarine ecology, sedimentary dynamics of barrier islands, relative sea level change, human influence, and major events such as hurricanes. The course includes grounding in the fundamentals of general theory and principles of marine science. Short lectures, demonstrations, group work and reports, and laboratory activities are the norm. (3-0) Y

NATS 3331 The Clash of Cosmologies (3 semester credit hours) Science and revelation in the nineteenth century. A study of the nineteenth century rise of scientific inquiry into the origins of life, and the reaction and response to its discoveries by the Victorian culture that both maintained biblical authority and celebrated man’s achievements. A study abroad component supplements this course. (3-0) Y

NATS 3341 Knowing and Learning in Mathematics and Science (3 semester credit hours) This course expands the prospective teacher's understanding of current theories of learning and conceptual development. Students examine their own assumptions about learning. Topics include psychological foundations of learning; problem solving in mathematics and science education utilizing technology; principles of expertise and novice understanding of subject matter; implications of high-stakes testing; and foundations of formative and summative assessment. Content also includes dyslexia training. Three lecture hours a week for one semester; additional hours may be required. Restricted to students in the UTeach Dallas program. Prerequisites: A university grade point average (GPA) of at least 2.750 and a GPA of 3.000 or better in UTeach coursework and UTeach advisor consent required. (3-0) S

NATS 3343 Classroom Interactions (3 semester credit hours) This course moves from a focus on thinking and learning to a focus on teaching and learning. Topics include principles of delivering effective instruction in various formats (lecture, lab activity, collaborative settings); examination of gender, class, race, and culture in STEM education; overview of policy related to STEM education. Students participate in an intensive, highly coached high school field experience comprised of 3 observations and 2 co-teaching events, including a multiple-period or day, connected lesson. Three lecture hours a week for one semester; at least nine hours of fieldwork a semester are also required. Students should also expect to dedicate out-of-class time to video transfer, lesson planning, and working on the portfolio project. Restricted to students in the UTeach Dallas program. Prerequisites: A university grade point average (GPA) of at least 2.750 and credit or registration for NATS 3341 and a GPA of 3.000 or better in UTeach coursework and UTeach advisor consent required. (3-0) S

NATS 4141 UTeach Apprentice Teaching Seminar (1 semester credit hour) Discussions include student teaching experiences, and contemporary critical issues in education. The portfolio project must be completed during the Apprentice Teaching semester. One class hour a week for one semester. Prerequisites: NATS 3343 and NATS 4341 and (NATS 4390 or MATH 3303) and
a university grade point average (GPA) of at least 2.750 and a GPA of 3.000 or better in UTeach coursework and consent of the UTeach advisor. Corequisite: NATS 4694 or NATS 4696. (1-0) S

**NATS 4310** Advanced Writing in the Natural Sciences and Mathematics (3 semester credit hours) A writing-intensive course on questions or problems in natural sciences and mathematics. Satisfies the School of Natural Sciences and Mathematics' advanced writing requirement. (3-0) S

**NATS 4341** Project-Based Instruction (3 semester credit hours) Students explore topics including foundations of project-based, case-based, and problem-based learning environments; principles of project-based curriculum development in STEM education; and, classroom management and organization of project-based learning classrooms are covered. Fieldwork usually includes 11 hours of observation, including at least 3 teaching days. Three lecture hours a week for one semester with additional fieldwork hours to be arranged. Prerequisites: NATS 3343 and a university grade point average (GPA) of at least 2.750 and a GPA of 3.000 or better in UTeach coursework and UTeach advisor consent required.

Prerequisite or Corequisite: NATS 4390 or MATH 3303. (3-0) S

**NATS 4390** Research Methods (3 semester credit hours) This UTeach science certification preparation course explores the nature of science and authentic scientific investigations through multiple, independent, student-driven research projects and scientific communication including scientific discourse in the context of advanced scientific writing. Prerequisites: NATS 3341 and a university grade point average (GPA) of at least 2.750 and a GPA of 3.000 or better in UTeach coursework and upper-level standing and UTeach advisor consent required.

Prerequisite or Corequisite: NATS 4341. (3-0) S

**NATS 4694** UTeach Apprentice Teaching, 7-12 Science and Mathematics (6 semester credit hours) Closely supervised observation and teaching in a science or mathematics classroom for Grades 7-12. Experience includes carrying out the duties of a high school teacher and requires a minimum of 7 hours of fieldwork a day for 14 weeks. Students must apply for Apprentice Teaching the semester prior to enrollment. Additional fee attached to course. Prerequisites: NATS 4341 and (NATS 4390 or MATH 3303) and a university grade point average (GPA) of at least 2.750 and a GPA of 3.000 or better in UTeach coursework and UTeach advisor consent required. Admission to the university's teacher certification program by the Teacher Development Center. Corequisite: NATS 4141. (6-0) S

**NATS 4696** UTeach Apprentice Teaching, 4-8 Science and Mathematics (6 semester credit hours) Closely supervised observation and teaching in a science or mathematics classroom for Grades 4-8. Experience includes carrying out the duties of a middle grades teacher and requires a minimum of 7 hours of fieldwork a day for 14 weeks. Students must apply for Apprentice Teaching the semester prior to enrollment. Additional fee attached to course. Prerequisites: NATS 4341 and (NATS 4390 or MATH 3303) and a university grade point average (GPA) of at least 2.750 and a GPA of 3.000 or better in UTeach coursework and UTeach advisor consent required. Admission to the university's teacher certification program by the Teacher Development Center. Corequisite: NATS 4141. (6-0) S

**NATS 4V41** Independent Study in Science and Math Education (1-6 semester credit hours) Independent study under a faculty member's direction. Student must obtain approval from participating Science and Math Education (SME) faculty member and the undergraduate advisor. May be repeated for credit (6 semester credit hours maximum). Instructor consent required. ([1-6]-0) S

**NATS 4V90** Special Topics in Natural Sciences (1-6 semester credit hours) May be repeated for credit as topics vary (9 semester credit hours maximum). Instructor consent required. ([1-6]-0) S

**NATS 4V91** Green Fellowship Directed Research (1-12 semester credit hours) Student assists faculty with research projects or conducts a research project under weekly faculty supervision.
Enrollment is limited to students selected for the Green Fellowship program. Associate Dean consent required. ([1-12]-0) Y