the artists’ connections to social, political, and cultural developments.

446 Study of Contemporary Art (3) Major movements in art from World War II through the 1980s; the role of modernism and the rise of postmodernism; focus on American and European art, Latin American and non-Western art also considered.

447 Latin American Art (3) Pre-Hispanic, colonial, and contemporary art of Latin America, including sculpture, and related arts throughout Latin America.

486 Issues in Contemporary Art (3) Principal issues confronting contemporary artists and the sources and theories behind the issues.

449 Art of the American South: 1560–1861 (3) History of architecture and art from the 16th century to the American Civil War in the states below the Mason-Dixon Line.

470 History of Photography (3) History of photography from its inception in the 1830s until the present; technological development of the medium and its inherent aesthetic; interrelationships between photography and other media.

480 Video Art and Theory (3) Sources and origins of artists’ video from the late 1960s to the present; consideration of technological, political, and social aspects; survey of single-channel, projected, installation, and Internet formats for video art display.

482 Digital Art History (3) Survey of art and technology focusing on the evolution of computer art and digital, interactive, and network-based art forms from the 1950s to the present.

484 New Media Art Theory (3) A reading intensive course that introduces students to issues and theories of new media art.

490 Independent Study in Art History (1–3) Prereq.: consent of instructor. May be taken for a max. of 6 hrs. of credit when topic varies. Advanced topics in art history.

499 Advanced Art Seminar (3) Prereq.: ARTH 1440, 1441, and an additional four art history courses; open to art history majors of junior and senior standing. Intensive reading, writing, and classroom discussion; introduction to art-historical research and methodologies.

7400 Art Theory and Criticism (3) Critic; building of art collection, from ancient to modern times.

7410 Colloquium in Art Historical Methods (1) An introduction to the historical development of the discipline of art history and art historical methodology.

7420 Special Topics in Art History (3) Prereq.: graduate standing in art or consent of instructor. May be taken for a max. of 6 hrs. of credit when topic varies. Advanced topics in art history.

7441, 7442 Graduate Research Seminar in History of Art (3,3) Each course may be taken for a max. of 6 hrs. of credit when topic varies; no more than 3 hrs. per semester.

7490 Independent Study in Art History (1–3) Prereq.: consent of instructor. May be taken for a max. of 6 hrs. of credit when topic varies.

ASTRONOMY • ASTR

General education courses are marked with stars (★).

★1101 The Solar System (3) Prereq.: MATH 1021 or an ACT math score of at least 22. Fundamental principles of the solar system.

★1102 Stellar Astronomy (3) Prereq.: MATH 1021 or an ACT math score of at least 22. Fundamental principles of stellar astronomy.

108 Observatory Laboratory (1) 2 hrs. lab. Prereq.: credit or registration in ASTR 1101. Analysis of light from celestial bodies with application to star charts and globes; visual and photographic observations will be made using telescopes; provides student with practical observing experience.

109 Astronomy Laboratory (1) 2 hrs. lab. Prereq.: credit or registration in ASTR 1102. Analysis of light from terrestrial and celestial sources; visual and photographic observations of stars and nebulae; training in the use of smaller telescopes and larger telescopes with multimedia technology.

2001 Current Topics in Astronomy and Astrophysics (3) Prereq.: ASTR 1102. Prereq.: instructor. Primarily for non-science majors. Topics of current interest in astronomy; recent topics include extraterrestrial intelligence, black holes, exploration of the solar system.

422, 4222 Introductory Astrophysics (3,3) V Prereq.: PHYS 1202 or 2102 or consent of instructor. ASTR 4221 is prerequisite for 4222. Sun, stars, and stellar systems; results and problems of modern astrophysical research.

426 Modern Observational Techniques (3) V Prereq.: ASTR 1102. Stars and galaxies; modern astronomical observations and reductions; the telescope, astronomical photography, spectroscopy and photoelectric observations and reductions.

4790 Special Topics in Observational Astronomy (3) V May be taken twice for credit when topics vary. One topic scheduled each time course is offered; current topics include astronomical spectroscopy and astronomical photometry. 4990 Special Topics in Astronomy (1–3) Prereq.: consent of instructor. May be taken for a max. of 3 hrs. of credit. Individual reading and theoretical and/or experimental work on advanced topics to be announced.

6101 Astronomy for Teachers (4) Su, V For teachers and students in the College of Education. Cannot be taken for credit by physics majors. General astronomy including the solar system, stellar system, and stellar systems. 6108 Astronomy Laboratory for Teachers (1–3) Su For non-science majors who are enrolled in the College of Education. May not be taken for credit by physics majors. May be taken for a max. of 9 hrs. of credit. 2–6 hrs. lab. Visual observation techniques including the use of star charts and globe; visual and photographic observation of celestial objects such as the sun, moon, stars, and nebulae using small reflectors as well as large telescopes through multimedia technology.

7741, 7742 Stellar Astrophysics (3,3) F SAST 7741 is prerequisite for 7742. Also offered as PHYS 7741, 7742. Application of physical principles to study of stars: spectroscopy, stellar atmospheres, stellar structure, and stellar evolution.

7752, 7753 Galactic Astrophysics (3,3) F SAST 7752 is prerequisite for 7753. Also offered as PHYS 7751, 7752. Application of physical principles to study of galaxies; interstellar medium, spiral structure and stellar motions in galaxies, and cosmology.

7777 Seminar in Astronomy and Astrophysics (1–6) V May be taken for a max. of 6 hrs. of credit. Also offered as PHYS 7777.

7783 Topics in Astronomy and Astrophysics (3) V May be taken for a max. of 6 hrs. of credit. Also offered as PHYS 7783.

BASIC SCIENCES • BASC

2010 Inquiry Approaches to Math and Science Teaching (1) Problems in Astronomy (1–3) Prereq.: consent of instructor. May be taken for a max. of 3 hrs. of credit when topic varies. Advanced topics in art history.

2020 Topics in Physical Science for Elementary School Teachers (3) Su only May be taken for a max. of 12 hrs. of credit when topic varies.

2002 Topics in Biological Science for Elementary School Teachers (3) Prereq.: 5 sem. hrs. of introductory biology. May be taken for a max. of 3 hrs. of credit when topic varies.

6003 Topics in Environmental Science for Elementary School Teachers (3) Su only May be taken for a max. of 9 hrs. of credit when topic varies.

7000 Methods of Instruction in College Life Science Laboratories (1) F Pass-fail grading. Philosophy and practice of life science laboratory education at the college level.

BIOLOGICAL ENGINEERING • BE

1250 Introduction to Engineering Methods (2) F 6 hrs. lab. Fundamentals of engineering design, presentation of an engineering design; graphical expression of engineering design using computer-aided drafting.

1252 Biology in Engineering (2) Prereq.: credit or registration in BIOL 1201. 1 hr. lecture; 3 hrs. lab. Effect of variability and constraints of biological systems on engineering problem solving and design; engineering units; engineering units for design; presentation; laboratory demonstration of biological engineering analysis.

2307 Elements of Landscape Construction (3) F Prereq.: MATH 1030, 1031, or consent of instructor; 3 hrs. lab. Theory and use of tape, level, transit, plane table, and compass; principles of area and volume calculations, land slope, drainage grades, legal land description; irrigation systems from water source to application and uptake by plants; water quality criteria and regulations for the agricultural community; production, treatment, and disposal of agricultural and food processing wastes; management of agricultural water supply; bi-product utilization; land application; wetland restoration; stream sampling and analysis; re-eration modeling; irrigation systems from water source to application and uptake by plants; water quality criteria and regulations for the agricultural community; production, treatment, and disposal of agricultural and food processing wastes; management of agricultural water supply; bi-product utilization; land application; wetland restoration; stream sampling and analysis; re-eration modeling; irrigation systems from water source to application and uptake by plants; water quality criteria and regulations for the agricultural community; production, treatment, and disposal of agricultural and food processing wastes; management of agricultural water supply; bi-product utilization; land application; wetland restoration; stream sampling and analysis; re-eration modeling.

4989 Special Projects in Biological Engineering (1–4) F S, Su Prereq.: consent of instructor. May be taken for a max. of 6 hrs. of credit. Library research, experimental and/or theoretical investigation, and written report in form of engineering report.

2490 Senior Engineering Design and Professionalism (2) F Prereq.: BE 3290. Students work in teams to develop a detailed design to address a technical problem that the team chose in BE 3290. Activities include developing measurable design objectives and a product design specification, creating multiple design solutions, evaluating design solutions, and communicating design.

2492 Senior Engineering Design Laboratory (2) S Prereq.: BE 4290, 6 hrs. lab. Engineering principles used to complete the project for the design project completion course. Submits final report to the summer project.

4303 Engineering Properties of Biological Materials (3) V Prereq.: MATH 1251, 2251, or credit or registration in CE 3400. 2 hrs. lecture; 3 hrs. lab. Engineering properties, including rheology, friction, mechanical damage, texture, and thermal, optical, and electrical properties.

4305 Biomechanics for Engineers (3) V Prereq.: CE 2450, 2 hrs. lecture; 3 hrs. lab. Also offered as IE 4465. Mechanical behavior of the human musculoskeletal system and component tissue when physical work is performed; engineering mechanics applied to the activities; fundamental knowledge of human anatomy and physiology; workplace design and safety, and other health considerations.

4323 Molecular Methods in Biological Engineering (3) V Prereq.: BIO 2083, BE 2350, and credit or registration in BE 4403. Fundamental principles of the theory and applications of quantitative molecular techniques used in biological engineering research and design.

4340 Food and Bioprocess Engineering (3) V Prereq.: BE 2352; credit or registration in BE 3340. 2 hrs. lecture; 3 hrs. lab. Design and analysis of systems for processing biological materials, with emphasis on processes. Includes biotechnology, fluid flow, thermodynamics, and transport phenomena in food and bioprocessing; unit operations, including free, convective, vacuum, and forced convection processing.

4341 Biological Reactor Systems Design (3) S Prereq.: BIOL 2053 and BE 3265. Prereq.: credit in BE 3133. 2 hrs. lecture; 3 hrs. lab. Design and analysis of systems for processing biological materials, with emphasis on processes. Includes biotechnology, fluid flow, thermodynamics, and transport phenomena in food and bioprocessing; unit operations, including free, convective, vacuum, and forced convection processing.