

**828. Social Structure**  
 Spring. 5(3-0) Approval of department.

Intensive analysis of theoretic models of social structure and their applicability for the analysis of cultures.

**829. History of Anthropological Theory**  
 Fall. 5(5-0) Approval of department.

A review of the various schools of thought, important personalities, and principal concepts that have contributed to the development of anthropological theory.

**831. Linguistic Anthropology**  
 Winter. 5(3-2) Approval of department.

The nature of language; techniques for the description and comparison of languages; linguistics as an anthropological tool; language and culture.

**833. Anthropological Problems of Prehistory**  
 Spring. 5(3-2) Approval of department.

Relation of archaeology to the other fields of anthropology on both a theoretical and practical level. Archaeological data are used to introduce problems of long-range cultural change and development.

**835. Human Osteology and Osteometry**  
 Fall of even-numbered years. 5(3-4) 821 or ANT 540.

Identification of human bones and fragments; aging, sexing and determining the race of skeletal remains; measuring techniques for cranial and postcranial remains; the more common forms of paleopathology.

**836. Hominid Paleontology**  
 Winter of even-numbered years. 4(3-1) 821.

Seminar requiring student research of general and specific topics of hominid paleontology, events, trends, and processes in hominid evolution.

**838. Interdisciplinary Seminar on Africa**  
 For course description, see Interdisciplinary Courses.

**850. Archaeological Methods and Techniques**  
 Winter. 4(4-0) 833 or approval of department.

Seminar outlining archaeological method and the role of technique in the strategy of archaeology. Techniques and problems of informational retrieval will be emphasized.

**856. Methodology of Anthropological Research**  
 Spring. 1 to 12 credits. Approval of department.

Seminar in problems of anthropological investigation considered in the framework of history and philosophy of science. Relevance of various field techniques, methods of data gathering and data handling, and strategies of analysis for various problems are treated.

**865. Environment, Technology, and Culture**  
 Spring. 4(3-0) Approval of department.

Cultural ecology, study of the relation of man and his physical environment, the role of technology in mediating between the two. Comparative analysis of the interdependence of social organization, technology and environment. Case histories of cultural and social change arising from technological innovations.

**870. Applied Anthropology**  
 Spring of odd-numbered years. 4(3-0) Approval of department.

Theoretical and methodological problems involved in planned social change. Course will focus on field experience in the local community. Designed mainly for graduate students having professional interest in the application of social change.

**872. Seminar in Special Subject Fields**  
 Fall, Winter, Spring, Summer. Variable credit. Approval of department.

Special fields of study will include any area of anthropology selected.

**875. Individual Research Projects**  
 Fall, Winter, Spring, Summer. Variable credit. Approval of department.

**880. Individual Readings**  
 Fall, Winter, Spring, Summer. Variable credit. Approval of department.

**899. Research**  
 Fall, Winter, Spring, Summer. Variable credit. Approval of department.

**922. Dimensions of Culture**  
 Winter. 5(5-0) Approval of department.

Intensive review of principles of cultural anthropology, ethnology, and cultural change with particular attention to systems theory and interconnections of cultural, social, personality, and ecological systems.

**923. Cultural Dynamics**  
 Spring. 5(3-2) Approval of department.

Intensive review of culture change theories, processes of the development of the self, contemporary cultural movements, and the application of anthropological knowledge.

**999. Research**  
 Fall, Winter, Spring, Summer. Variable credit. Approval of department.

**ART**

**College of Arts and Letters**

**History of Art**

**H A**

**205. Introduction to Art**  
 (ART 205.) Fall, Winter, Spring. 3(3-0) Not open to majors.

Painting, sculpture and architecture from the time of the Greeks to the present. Individual works of art examined intensively, as regards both their formal qualities and the manner in which they exemplify the shifting patterns of Western culture.

**206. History of Western Art**  
 (ART 266.) Fall. 4(4-0)

Painting, sculpture, architecture and decorative art from prehistoric to modern times. Provides acquaintance with the forms of art typical of each period and indicates the aesthetic qualities which give them artistic significance. Work in first term covers Prehistoric, Egyptian, Mesopotamian, Greek, Roman, Early Christian and Byzantine periods.

**207. History of Western Art**  
 (ART 267.) Winter. 4(4-0)

Continuation of 266. Early Medieval, Romanesque, Gothic, Renaissance and Mannerist periods.

**208. History of Western Art**  
 (ART 268.) Spring. 4(4-0)

Continuation of 267. Baroque, Rococo, Neo-Classical and subsequent periods to contemporary art.

**400H. Honors Work**  
 (ART 400H.) Fall, Winter, Spring, Summer. 1 to 6 credits. Approval of department.

**404. Greek Art**  
 (ART 450.) Winter. 4(3-0) 206 or approval of department.

The history of painting, sculpture and architecture of ancient Greece from the Bronze Age through the end of the Hellenistic period.

**405. Roman Art**  
 (ART 451.) Spring. 4(3-0) 206 or approval of department.

The history of painting, sculpture and architecture of Ancient Rome with major emphasis on the Late Republic and Early Empire.

**406. Ancient Painting**  
 (ART 452A.) Spring of odd-numbered years. 4(3-0) 206 or approval of department.

Ancient Greek and Roman painting, including Minoan Crete. Special emphasis is placed on Archaic and Classical Greek painting on pottery and on Roman wall painting from Pompeii and elsewhere.

**407. Ancient Sculpture**  
 (ART 452B.) Fall of odd-numbered years. 4(3-0) 206 or approval of department.

The sculpture of Ancient Greece and Rome, from the Bronze Age through Early Christian times.

**408. Ancient Architecture**  
 (ART 452C.) Winter of even-numbered years. 4(3-0) 206 or approval of department.

The architecture of Ancient Greece and Rome, from Mycenaean times to the 6th century A.D., with special emphasis on the religious architecture of Classical Greece and Imperial Rome.

**410. Byzantine Art**  
 (ART 454.) Fall, Summer. 4(3-0) 206 or approval of department.

Late antique painting, sculpture and architecture and their development in the East Christian Empire and Orthodox Russia.

**411. Early Medieval Art**  
 (ART 455.) Winter, Summer. 4(3-0) 207 or approval of department.

History of architecture, sculpture, and painting in the Latin West from Hiberno-Saxon art of the 7th century to the Romanesque Abbeys of the 12th century.

**412. Later Medieval Art**  
 (ART 456.) Spring, Summer. 4(3-0) 207 or approval of department.

Gothic painting, sculpture, and architecture with particular emphasis on the cathedrals of the 13th century.

**420. Italian Renaissance Architecture**  
 (ART 485.) Spring. 4(3-0) 207 or approval of department.

Important buildings of the 15th and 16th centuries, architectural theories, and architectural representations in drawings and paintings.

**421. Italian Renaissance Sculpture**  
 (ART 484.) Winter. 4(3-0) 207 or approval of department.

Major artists from circa 1250 to 1600.

- 422. Italian Renaissance Painting—Fifteenth Century**  
(ART 460A.) Fall. 4(3-0) 207 or approval of department.  
Developments in Italian painting, especially Florentine, of the 14th and 15th centuries, with emphasis on 15th century masters such as Masaccio, Piero della Francesca and Botticelli.
- 423. Italian Renaissance Painting—Sixteenth Century**  
(ART 460B.) Spring. 4(3-0) 207.  
Emphasis on Leonardo, Michelangelo, Raphael, Titian, Tintoretto, and other important masters of the High and Late Renaissance.
- 427. Northern Renaissance Painting**  
(ART 461.) Fall, Summer. 4(3-0) 207 or approval of department.  
The two centuries paralleling the Renaissance in Italy: the Van Eycks and their school, the French and German masters.
- 430. Seventeenth and Eighteenth Century Art in Italy**  
(ART 466A.) Fall of odd-numbered years. 4(3-0) 208 or approval of department.  
Art and architecture of Italy in the 17th and 18th centuries; Caravaggio, the Carracci, Bernini, Borromini, Guarini, Juvarda, Piazzetta, Tiepolo, Piranesi, Guardi.
- 431. Seventeenth Century Art in Flanders and Spain**  
(ART 466B.) Fall of even-numbered years. 4(3-0) 208 and approval of department.  
Painting and sculpture in the Spanish Netherlands and Spain during the 17th century: Rubens, Van Dyck, Jordaens, Zurbaran, Montanes, Velazquez, Murillo and still life and genre specialists.
- 433. Seventeenth Century Dutch Art**  
Winter of odd-numbered years. Spring of even-numbered years. 4(3-0) 208 or approval of department.  
Art and architecture of the Northern Netherlands during "The Golden Age" with emphasis on paintings of Rembrandt, Vermeer, Hals and genre, still-life and landscape specialists.
- 434. Art of Seventeenth Century France**  
Spring of odd-numbered years. 4(3-0) 208 or approval of department.  
French art and architecture from the reign of Henri IV through the reign of Louis XIV, 1589-1715.
- 435. Eighteenth Century Art in England and France**  
(ART 466C.) Fall of even-numbered years. 4(3-0) 208 and approval of department.  
Art and architecture of England and France during the 18th century: the painting of Watteau, Chardin, Hogarth, Gainsborough and others; the Rococo style in France and stylistic eclecticism in England.
- 437. Art and Architecture of Central Europe**  
Spring of even-numbered years. 4(3-0) 208 or approval of department.  
Art and architecture of Germany, Austria, Switzerland and Bohemia during the 17th and 18th centuries with emphasis on architecture of Fischer von Ehrlach, Hildebrandt and Neumann.
- 440. Modern Architecture**  
(ART 475.) Fall. 4(3-0) 208 or approval of department.  
History of modern architecture in Europe and

the Americas from its beginnings in the nineteenth century to the present day.

- 442. Modern Sculpture**  
(ART 474.) Spring. 4(3-0) 208 or approval of department.  
From ca. 1800 to the present.  
From Rodin to the present, with special attention to contemporary sculptors.
- 445. European Painting: 1760-1848**  
(ART 478.) Fall, Summer. 4(3-0) 208 or approval of department.  
The revival and development of Classicism in the late 18th and early 19th centuries and the flowering of Romanticism; a study of the rich complexities of painting in Europe.
- 446. European Painting: 1848-1917**  
(ART 479.) Winter. 4(3-0) 208 or approval of department.  
Realism in conflict with the established traditions; growth and development of Impressionism, Post Impressionism, Symbolism, the Pre-Raphaelitism, Fauvism, Cubism, Expressionism and Futurism.
- 450. Twentieth Century Painting**  
(ART 476.) Spring. 4(3-0) 208 or approval of department.  
Development of painting from 1917 to the present with special reference to the various "isms" that have characterized it since that time.
- 460. Seventeenth and Eighteenth Century American Art**  
(ART 486.) Fall. 4(3-0)  
Architecture and painting from colonial times to 1820; the Colonial and Georgian styles as evidence of the emerging American pattern.
- 461. Nineteenth Century American Art**  
(ART 487.) Winter. 4(3-0)  
Architecture, painting and sculpture from 1820 to 1900; the expression of romanticism and eclecticism in the search for a native style.
- 462. Twentieth Century American Art**  
(ART 488.) Spring. 4(3-0)  
Architecture, painting and sculpture from 1900 to the present; the role of Wright, the Ash Can School, Regionalists, and Abstract-Expressionists in American culture.
- 470. Art of India and Southeast Asia**  
(ART 472.) Fall, Winter. 4(3-0)  
Buddhism and Hinduism as forces in shaping the arts of India and Southeast Asia; symbolism in the art of the East; the conquest by Islam.
- 471. Art of China**  
(ART 473.) Fall, Winter. 4(3-0)  
Buddhism and Taoism and their importance in the formation of the art of China in the bronzes, the landscape paintings of the Sung and Yuan dynasties, and in the paintings of the Ming and Ch'ing dynasties.
- 472. Art of Japan**  
(ART 477.) Fall, Winter. 4(4-0)  
Architecture, sculpture and painting as expressive of the Japanese ideals: the relationship of Japanese art to Chinese art and its independence from Chinese art; landscapes and the Ukiyo-e tradition.
- 484. History of Prints**  
(ART 469.) Winter. 4(3-0)  
History and appreciation of engraving, etching, lithography and woodcuts. Durer, Rembrandt, Goya, Daumier and contemporary printmakers. Prints and book illustrations as source material.

- 485. Special Problems**  
(ART 440.) Fall, Winter, Spring. Variable credit. May re-enroll for a maximum of 10 credits. Approval of department.  
Selected problems in history of art for individual study.
- 800. Seminar in Ancient Art**  
(ART 861.) Fall, Winter, Spring. 4 credits.
- 810. Seminar in Medieval Art**  
(ART 862.) Fall, Winter, Spring. 4 credits.
- 820. Seminar in Italian Renaissance Art**  
(ART 863.) Fall, Winter, Spring. 4 credits.
- 830. Seminar in Seventeenth and Eighteenth Century European Art**  
(ART 865.) Fall, Winter, Spring. 4 credits.
- 840. Seminar in Modern Art**  
(ART 866.) Fall, Winter, Spring. 4 credits.
- 860. Seminar in American Art**  
(ART 867.) Fall, Winter, Spring. 4 credits.
- 885. Problems in History of Art**  
(ART 860.) Fall, Winter, Spring, Summer. Variable credit. May re-enroll for a maximum of 15 credits. Approval of department.  
Selected graduate problems in history of art for individual study.
- 886. Teaching Seminar: History of Art**  
(ART 856.) Fall. 2 credits. Approval of department.  
A special seminar in methods of teaching history of art.
- 887. Teaching Seminar: History of Art**  
(ART 857.) Winter. 2 credits. Approval of department.  
A special seminar in methods of teaching history of art.
- 888. Teaching Seminar: History of Art**  
(ART 858.) Spring. 2 credits. Approval of department.  
A special seminar in methods of teaching history of art.
- 899. Research**  
(ART 899.) Fall, Winter, Spring. Variable credit. May re-enroll for maximum of 12 credits. Approval of department.

## Studio Art

STA

- 100. Studio Art**  
(ART 100.) Fall, Winter, Spring, Summer. 2(0-6) Not open to Art majors.  
Principles of design, drawing, color with free experimentation with their expressive uses.
- 131. Art I**  
(ART 131.) Fall, Winter, Spring, Summer. 4(0-10)  
Introduction to design, the basis for all art courses. Exploratory work directed toward an understanding of the relationship of materials and procedures to artistic expression. General nature of visual art is examined through classroom discussion of slides, reproductions and actual works of art. Work mostly in black and white.

**132. Art II**

(ART 132.) Fall, Winter, Spring. 4(0-10) 131.

Continuation of 131, with increasing use of color and a variety of media.

**133. Art III**

Spring, Summer. 4(1-8) 132.

Continuation of 131 and 132.

**200. Photography**

Fall, Winter, Spring, Summer. 2(2-0)

Discussion of the history of light-sensitive materials. Practical demonstrations, slide presentations; study of equipment and fundamental problems.

**200A. Photography Laboratory**

Fall, Winter, Spring, Summer. 2(0-4) 133, approval of department. Must enroll in 200.

A supplement to 200. Experience in studio work in camera and darkroom investigations. Students must furnish camera, exposure meter and all chemicals and photo-sensitive materials.

**201. Art for Elementary Teachers**

(ART 201.) Fall, Winter, Spring, Summer. 4(1-9) ED 200; approval of department. Not open to Freshmen or Art majors.

Understanding the creative art experiences of children. Studio work in materials suitable for grade school use. Reading and discussions relating the child's growth and development and his art experience.

**228. Sculpture**

(ART 228.) Fall, Winter, Spring, Summer. 4(0-10) 133.

Preparation for sculpture, involving experience with three dimensional forms. Exploration of the characteristics of sculpture past and present.

**231. Graphic Design**

(ART 231.) Fall, Winter, Spring, Summer. 4(0-10) 133.

Letterforms leading to the understanding of written and printed letters; the traditional methods by which they are produced and their relation to modern typography.

**240. Ceramics**

(ART 240.) Fall, Winter, Spring, Summer. 4(0-10) Majors: 133.

An exploration of form mainly from the standpoint of the enclosed volume. The complete process from the preparation of clay bodies to the glazed and fired piece. Limited to earthenware.

**241. Drawing I**

(ART 241.) Fall, Winter, Spring, Summer. 4(0-10) May re-enroll for a maximum of 8 credits. 133.

Introduction to tools and materials of drawing, using various approaches to the representation of both real and intangible forms with an emphasis on the human figure.

**245. Design**

(ART 245.) Fall. 4(0-10) 133.

Use of basic design elements in two and three dimensions. Study of the appropriateness of forms to various media. Introduction to applied design procedures and processes.

**247. Printmaking**

(ART 247.) Fall, Winter, Spring, Summer. 4(0-10) 241.

Study of the art of printmaking and its major techniques. Studio practice in a wide range of printing methods.

**255. Painting**

(ART 255.) Fall, Winter, Spring, Summer. 4(0-10) 241.

Pictorial expression. Class discussion and studio work in a variety of media.

**300. Still Photography I**

Fall, Summer. 5(0-10) Junior majors, 200A or approval of department.

Emphasis on light as form-giver, modifier and reducer.

**301. Still Photography II**

Winter, Summer. 5(0-10) 300.

Continuation of 300 with emphasis on subject matter, single and serial as form and information.

**303. Resources and Materials for Art Education I**

(ART 303.) Fall, Winter, Spring, Summer. 4(1-9) ED 200; 24 credits in studio art.

Concepts, processes and materials as they apply to art teaching situations.

**305. Serigraphy**

(ART 305.) Fall, Winter, Spring, Summer. 3(0-6) Junior majors, 241, 247.

Silk screen as a fine print medium. Basic techniques as a means toward expressive development.

**306. Lithography**

(ART 306.) Winter, Spring. 3(0-6) 247, 340.

Techniques of the medium, preparing the stone, etching, printing, the use of tusche, wash, rubbing, etc.

**307. Etching**

(ART 307.) Fall, Winter, Spring, Summer. 5(0-10) Junior majors, 241, 247.

Techniques of straight etching, soft ground and aquatint.

**308. Relief Prints**

Fall, Summer. 5(0-10) Junior majors, 247.

Printing from a raised surface as a contemporary medium. Review of traditional techniques and materials as the basis for individual experimentation and expression.

**310. Film Art I**

Fall, Summer. 5(0-10) 200A, Junior majors or approval of department.

Sequential time relationships; programed slide presentations and hand drawn film synchronized with sound.

**311. Film Art II**

Winter, Summer. 5(0-10) 310.

Emphasis on the animated film.

**320. Resources and Materials of Art in Education II**

(ART 320.) Fall, Winter, Spring, Summer. 4(0-8) 303.

Art teaching. Learning experiences with children and youth.

**324. Graphic Design**

(ART 324.) Fall, Winter, Spring, Summer. 5(0-10) May re-enroll for a maximum of 15 credits. Junior majors, 231, 241.

Visual communication involving the complete range of specialized materials, methods and processes leading to an understanding of the unique limitations of graphic design.

**328. Sculpture**

(ART 328.) Fall, Winter, Spring, Summer. 5(0-10) Junior majors, 228, 241.

Exploration of the physical characteristics and possibilities of clay within the limitation of figurative representation. Plaster casting, wax modeling, etc.

**339. Design Communications**

(ART 339.) Fall, Summer. 5(0-10) 241, 245; EGR 162.

Methods of representation, including drawing, delineation, photography with experimental exploitation of new tools and techniques.

**340. Drawing II**

(ART 340.) Fall, Winter, Spring, Summer. 5(0-10) May re-enroll for a maximum of 15 credits. Junior majors, 241.

Advanced problems in drawing as an end in itself, stressing experimentations with form and materials.

**341. Ceramics**

(ART 341.) Fall, Winter, Spring, Summer. 5(0-10) Junior majors, 240, 241, approval of department.

Creating and executing designs in clay for pottery and other compositions. Making glazes, stacking and firing a kiln.

**344. Industrial Design I**

(ART 344.) Fall, Winter, Spring, Summer. 5(0-10) Junior majors, 241, 245; EGR 161, 162 or 267.

Products and product systems from the visual and practical point of view. Research and analysis as a prelude to meaningful design. Reports, sketches, renderings, study mockups and presentation models.

**353. Composition and Painting**

(ART 353.) Summer. 3 to 6 credits.

Approval of department. 24 or 36 hours per week in class; additional hours arranged. Course given at Leelanau Summer Art School, Leland, Michigan.

Composition practice, analysis and painting technique. Still-life, figure, and landscape.

**355. Painting**

(ART 355.) Fall, Winter, Spring, Summer. 5(0-10) Junior majors, 241, 255.

Survey of accepted working procedures in all phases of oil painting, exploration of a wide range of problems of expression based on still life and the human figure.

**391. Jewelry**

(ART 391.) Fall, Winter, Spring, Summer. 3(0-6) Junior majors.

Basic jewelry and metal techniques in sheet metal, wire and casting. Polishing and setting stones, repousse, etc.

**400H. Honors Work**

(ART 400H.) Fall, Winter, Spring, Summer. 1 to 6 credits. Approval of department.

**401. Still Photography Workshop**

Fall, Winter, Spring, Summer. 5 to 10 credits. May re-enroll for a maximum of 30 credits. 301, approval of department.

Continuation of 301 leading to independent study.

**405. Advanced Serigraphy**

(ART 405.) Fall, Winter, Spring, Summer. 1 to 6 credits. May re-enroll for a maximum of 18 credits. 305, approval of department.

Continuation of 305 for superior students with a demonstrated potential for advanced independent study.

**406. Advanced Lithography**

Fall, Winter, Spring, Summer. 1 to 6 credits. May re-enroll for a maximum of 18 credits. 306, approval of department.

Continuation of 306 for superior students with a demonstrated potential for advanced independent study.

- 407. Advanced Etching**  
Fall, Winter, Spring, Summer. 1 to 6 credits. May re-enroll for a maximum of 18 credits. 307, approval of department.  
Continuation of 307 for superior students with a demonstrated potential for advanced independent study.
- 408. Advanced Relief Prints**  
Fall, Winter, Spring, Summer. 1 to 6 credits. May re-enroll for a maximum of 18 credits. 308 or approval of department.  
Continuation of 308 for students interested in a deeper exploitation of the various block printing media.
- 410. Film Workshop**  
Fall, Winter, Spring, Summer. 5 to 10 credits. May re-enroll for a maximum of 30 credits. 310, approval of department.  
Film workshop with emphasis on independent study. Live film assignments.
- 420. Advanced Problems in Crafts**  
(ART 420.) Fall, Winter, Spring, Summer. 5(1-8) May re-enroll for a maximum of 15 credits. Twenty-four credits of art practice; approval of department.  
Exploration of new materials, plastics, alloys, etc. employing research procedures leading to creative uses of such materials alone and in conjunction with conventional media.
- 421. Art for Classroom Teachers**  
(ART 421.) Summer. 3(1-3) Certified classroom teachers.  
Reading and discussion relating the child's art experience to his growth and development. Outside assignments required.
- 422. Art for Classroom Teachers**  
(ART 422.) Summer. 3(1-3) 201 or 421.  
Continuation of 421.
- 423. Art in Special Education**  
(ART 423.) Summer. 3(2-2) Junior and Senior Special Education majors and approval of department.  
Art and the art teacher in relation to the exceptional child. Development of an understanding of the creative processes of handicapped children.
- 424A. Advanced Graphic Design**  
(ART 424, ART 424A.) Fall. 5 to 10 credits. May re-enroll for credit. Seniors; 324; approval of department.  
Design and production of a book. Advanced group problems.
- 424B. Advanced Graphic Design**  
(ART 424, ART 424B.) Winter. 5 to 10 credits. 424A.  
Advanced problem solving involving existing media of graphic expression. Study of graphic equivalents of literal images and ideas in the creation of posters, trademarks and magazine and book covers.
- 424C. Advanced Graphic Design**  
(ART 424, ART 424C.) Spring. 5 to 10 credits. 424B.  
Graphic design workshop. Advanced study of type faces, paper, light-sensitive materials, etc. Major emphasis on individual independent study.
- 428. Advanced Sculpture**  
(ART 428.) Fall, Winter, Spring, Summer. 5 to 10 credits. May re-enroll for a maximum of 35 credits. 328.  
Continuation of 328. Problems in carving, modeling, casting in wax, clay, plaster, direct metal, etc.
- 431. Advanced Ceramics**  
(ART 431.) Fall, Winter, Spring, Summer. 5 to 10 credits. May re-enroll for a maximum of 35 credits. 341.  
Continuation of 341 with increased opportunity for supervised individual study.
- 433. Advanced Composition and Painting**  
(ART 433.) Summer. 3 to 6 credits.  
May re-enroll for credit. 353, 355 or approval of department.  
Continuation of 353 or 355 with increased opportunity for supervised independent development.
- 435. Advanced Painting**  
(ART 435.) Fall, Winter, Spring, Summer. 5 to 10 credits. May re-enroll for a maximum of 30 credits. 340, 355.  
Continuation of 355 with increased opportunity for supervised independent development.
- 440. Special Problems**  
(ART 440.) Fall, Winter, Spring, Summer. 2 to 5 credits. Approval of department.  
Advanced work developed from special interest areas.
- 444. Industrial Design II**  
(ART 444.) Fall, Winter, Spring, Summer. 5 to 10 credits. May re-enroll for a maximum of 35 credits. 344, approval of department.  
Continuation of 344 with a broader choice of projects in industrial design and increased emphasis on independent development.
- 449. Advanced Jewelry**  
(ART 449.) Fall, Winter, Spring, Summer. 1 to 6 credits. May re-enroll for a maximum of 12 credits. 391, approval of department.  
Continuation of 391 with augmented opportunities for independent development and additional techniques.
- 800. Studio Problems**  
(ART 800.) Fall, Winter, Spring, Summer. 1 to 6 credits.  
Studio problems in drawing, painting, printmaking, graphic design, industrial design, interior design, advertising design, sculpture-carving, sculpture-direct metal, ceramics.
- 801. Painting**  
(ART 801.) Fall, Winter, Spring, Summer. 3 to 12 credits.  
Advanced work in a variety of painting media with strong emphasis on independent development.
- 802. Drawing**  
(ART 802.) Fall, Winter, Spring, Summer. 3 to 12 credits.  
Advanced work in drawing employing a variety of media and calculated to contribute to development in related areas of art practice.
- 803. Sculpture**  
(ART 803.) Fall, Winter, Spring, Summer. 3 to 12 credits.  
Advanced work in a variety of three dimensional media with strong emphasis on individual development.
- 804. Ceramics**  
(ART 804.) Fall, Winter, Spring, Summer. 3 to 12 credits.  
Advanced work in pottery involving a variety of experiences and leading to independent development.
- 805. Serigraphy**  
(ART 805.) Fall, Winter, Spring, Summer. 3 to 12 credits.  
Work in silk screen printmaking techniques leading to independent expressive development.
- 806. Graphic Design**  
(ART 806.) Fall, Winter, Spring, Summer. 3 to 12 credits.  
Advanced work in all phases of the area of graphic design leading to independent development.
- 807. Industrial Design**  
(ART 807.) Fall, Winter, Spring, Summer. 3 to 12 credits.  
Advanced study in the areas of design analysis and product development with emphasis on continued independent development.
- 808. Crafts**  
(ART 808.) Fall, Winter, Spring, Summer. 3 to 12 credits.  
Advanced work in jewelry and metal, and other related areas leading to continued independent development.
- 809. Etching**  
Fall, Winter, Spring, Summer. 3 to 12 credits.  
Work in etching leading to expressive independent development.
- 810. Lithography**  
Fall, Winter, Spring, Summer. 3 to 12 credits.  
Work in lithographic techniques leading to expressive independent development.
- 820. Problems in Art Education**  
(ART 820.) Fall, Winter, Spring. 1 to 5 credits. May re-enroll for a maximum of 15 credits. 421 or 422 or a bachelor's degree in art from an accredited institution.
- 821. Art Instructional Media Laboratory I—Multi-Media**  
(ART 821.) Fall, Winter, Spring, Summer. 4(1-9) May re-enroll for a maximum of 8 credits. Certified classroom teachers with a bachelor's degree and a major in art.  
Experimentation with art techniques, films, filmstrips, slides, photographs, audio tapes and various projection devices for purposes of developing art teaching materials of both aesthetic and educational value.
- 822. Art Instructional Media Laboratory II—Television**  
(ART 822.) Fall, Winter, Spring, Summer. 4(1-9) May re-enroll for a maximum of 8 credits. T R 437 or experience in the television field. Interdepartmental and administered jointly with the Television and Radio Department.  
Review and analysis of teaching video tapes and television programs in art. Students may write television scripts, design sets and props, and teach in a taped or live closed-circuit or open channel program.
- 840. Teaching Seminar—Art Practice**  
(ART 840.) Fall, Winter, Spring, Summer. 1 to 3 credits. May re-enroll for a maximum of 6 credits. Approval of department.  
Supervised teaching of college classes in art practice.
- 899. Research**  
(ART 899.) Fall, Winter, Spring. Variable credit. May re-enroll for a maximum of 12 credits. Approval of department.

**ARTS AND LETTERS A L**

**College of Arts and Letters**

**390H. Perspectives in Literature**

Fall. 4(3-0) Juniors, approval of the Honors College.

Attention will be focused on several major literary works. Students will employ various types of literary analysis, considering theme, idea, structure, etc., and examining some major trends in contemporary literary criticism.

**391H. Perspectives in Philosophy**

Winter. 4(3-0) Juniors, approval of the Honors College.

The two primary areas of concern will be ethics and aesthetics, the emphasis on one or the other to be determined by the professor. The course will include reading of major works, discussion of major figures in the field, and the preparation of a substantial paper.

**392H. Perspectives in History**

Spring. 4(3-0) Juniors, approval of the Honors College.

The focus will be on the nature of international diplomacy in the 20th century, the development of nationalism, the balance of power system, the influence of new ideologies, and the developments of the power structure since 1945.

**450. Arts Management**

Fall, Winter, Spring. 3 to 5 credits. May re-enroll for a maximum of 9 credits. Seniors or Graduate Students or approval of department.

Administration of arts organizations, management of facilities, understanding operational methods and procedures of performing companies, financial structure and funding of arts centers, study of audience development, contemporary trends in arts management field.

**ASTRONOMY AST**

**College of Natural Science**

**119. General Astronomy**

Fall, Winter, Spring, Summer. 4(4-0) Not open to engineering or physical science majors or minors.

Physical nature of solar system, star clusters, and galaxies as seen by modern astronomers. Limited opportunity for astronomical observations.

**217. General Astronomy**

Fall, Winter. 4(4-0) MTH 102.

Descriptive course intended primarily for physical science majors. A semi-quantitative discussion of time, telescopes, the solar system, stars, clusters of stars, galaxies, and cosmology. Limited opportunity for astronomical observations.

**229. General Astronomy**

Spring. 4(4-0) PHY 287 or 291 or concurrently. Students may not receive credit in more than one of the following: 119, 217, 229.

Fundamental observations in astronomy and their interpretation through physical laws. Intended for physical science majors and recommended for astrophysics majors. Quantitative discussion of orbital motion, time, telescopes, solar system, stars, galaxies, and cosmology. Limited opportunity for astronomical observations.

**327. Practical Astronomy**

Spring. 3(3-0) 217, MTH 113.

Celestial coordinate systems. Time conversion and sidereal time. Atmospheric refraction, parallax, proper motion, aberration, and precession. Star catalogs and ephemerides. Finding charts and setting of equatorial telescopes.

**378. Contemporary Astronomy**

Winter. 3(3-0) 119 or 217; MTH 113.

A continuation of 119 or 217 with particular emphasis on modern developments. Includes interstellar matter, star formation, stellar evolution through final stages, supernovae, pulsars, neutron stars, galaxies and cosmology.

**437. Observatory Practice**

Fall. 3(1-4) 327.

Stellar photography. Photographic photometry. Photoelectric photometry and corrections for atmospheric extinction. Multicolor photometric systems. Astronomical spectroscopy and radial velocity determinations.

**458. Astrophysics**

Winter. 3(3-0) 217 or 229, PHY 289, or approval of department.

Application of physical principles to the atmospheres and interiors of stars to deduce their physical properties. Discussion of radiation, spectra and gas properties.

**459. Solar System Physics**

Fall. 3(3-0) PHY 289 or approval of department.

Physical properties of the sun, interplanetary space, planets, and satellites as deduced from terrestrial observations and from space probes. Recent results of the NASA space program will be emphasized.

**490. Special Problems**

Fall, Winter, Spring, Summer. 1 to 5 credits. Approval of department.

Individual study or project under the direction of a faculty member. An oral report on the work may be required in department seminar.

**801. Seminar**

Winter. 1(1-0) May re-enroll for a maximum of 2 credits. Graduate students or approval of department.

Seminars to be presented by both faculty and students to review papers in the current astronomical research literature.

**819. Stellar Structure**

Spring of even-numbered years. 3(3-0) 458 or PHY 395 or approval of department.

Physical properties of the stellar interior. Methods of calculating models. Stellar evolution. Comparison of theory with current observations.

**828. Galactic Structure**

Winter of even-numbered years. 3(3-0) PHY 427 or approval of department.

Distribution and dynamics of stars and interstellar material in our galaxy. Spiral structure. Galactic evolution.

**839. Celestial Mechanics**

Spring of even-numbered years. 3(3-0) PHY 427 or approval of department.

Two-body, three-body, and n-body problems. Orbital elements. Potential of solid objects. Orbital motion and perturbations for planets, rockets, and satellites.

**850. Ionized Gases**

Spring. 3(3-0) E E 835 or PHY 448. Interdepartmental with and administered by Electrical Engineering.

Elastic collision processes; Boltzmann equation; moment equations; basic plasma phenomena; motion of a charged particle in electrical and magnetic field; individual and collective charged particle behavior.

**859. Stellar Atmospheres**

Spring of odd-numbered years. 3(3-0) 458 or PHY 395 or approval of department.

The physics of radiation and the equation of its transfer. Theory of absorption coefficient and line absorption profile. The gray atmosphere and calculation of model atmospheres.

**860. General Relativity and Cosmology I**

Fall of even-numbered years. 3(3-0) PHY 859 or approval of department. Interdepartmental with and administered by the Physics Department.

Conceptual foundations of general relativity theory; elements of tensor calculus; Riemann-Christoffel curvature tensor; the field equations; experimental tests; special solutions; the extension to cosmology.

**861. General Relativity and Cosmology II**

Winter of odd-numbered years. 3(3-0) 860. Interdepartmental with and administered by the Physics Department.

Relativistic cosmology: the model universes; steady-state theory; observational evidence and possibilities for decision among models; current problems.

**989. Waves and Radiations in Plasmas**

Fall of even-numbered years. 3(3-0) 850. Interdepartmental with and administered by Electrical Engineering.

Plasma oscillation; interaction, electromagnetic fields with plasmas, wave propagation in magnetoionic media; plasma sheath; radiation of electric source in incompressible and compressive plasmas; electroacoustic waves; magneto-hydrodynamics; research topics in plasmas.

**AUDIOLOGY AND SPEECH SCIENCES ASC**

**College of Communication Arts**

**093. Remedial Speech**

Fall, Winter, Spring, Summer. 0(2-0) [2(2-0)]†.

Special help in relieving or compensating for disorders of speech.

**108. Voice and Articulation**

Fall, Winter, Spring, Summer. 3(4-0)

The study and development of the skills of voice and articulation.

**222. Oral Language Development**

Winter, Summer. 3(2-0)

Emergence and development of receptive and expressive aspects of oral language of the child.

**274. Structures and Functions of Speech and Hearing Mechanisms**

(854A, 475.) Fall, Winter. 3(3-0) 108 or approval of department.

Peripheral and central auditory mechanisms and the respiratory, phonatory and articulatory mechanisms for speech.

**276. Descriptive Phonetics**

(275.) Winter, Spring. 3(3-0) 274 or approval of department.

Detailed description of the principles that underlie the production of speech sounds.

**277. Scientific Bases of Voice Communication Process**

(275.) Fall, Spring. 3(3-0) 276 and PHY 237 or approval of department.

Scientific bases of voice communication with special reference to the acoustic aspect of production.