871  Theory of Statistics I
Fall, 3(3-0) RB: (MTH 828 or concurrently and STT 881 or concurrently)

872  Theory of Statistics II
Spring, 3(3-0) RB: (STT 871 and STT 882 or concurrently)
Theory of Neyman Pearson tests and extensions. Convex loss estimation, best unbiased estimates, sufficient statistics, information lower bounds. Extensive application to linear models. LAN families and applications to estimation and tests.

881  Theory of Probability I
Fall, 3(3-0) RB: (MTH 828 or concurrently)

882  Theory of Probability II
Spring, 3(3-0) RB: (STT 881)
Conditional expectation, martingales, stationary processes, Brownian motion, convergence in distribution, and the invariance principle.

886  Stochastic Processes and Applications
Fall, 3(3-0) RB: (STT 441 or STT 861)
Markov chains and their applications in both discrete and continuous time, including classification of states, recurrence, limiting probabilities. Queuing theory. Poisson process and renewal theory.

888  Stochastic Models in Finance
Spring, 3(3-0) RB: (STT 441 or STT 861) SA: STT 887
Stochastic models used in pricing financial derivatives. Discrete-time models, Brownian motion, stochastic integrals and Ito's formula, the basic Black-Scholes model, risk neutral distribution, European and American options, exotic options, the interest rate market, futures and interest rate options.

890  Statistical Problems
Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 24 credits in all enrollments for this course. R: Approval of department.
Individualized study on selected problems.

893  Master's Thesis Research
Fall, Spring, Summer. 1 to 6 credits. A student may earn a maximum of 36 credits in all enrollments for this course. R: Approval of department.
Master's thesis research.

894  Applied Regression Models in Business Research
Spring, 3(3-0) Interdepartmental with Management. Administered by Department of Management. RB: (STT 430 or STT 441) or equivalent R: Open only to doctoral students in Business Administration.
Seminar on design and analysis of regression-based statistical models. Modeling issues arising in business research.

895  Advanced Survival Analysis
Spring of odd years, 3(3-0) Interdepartmental with Epidemiology. Administered by Department of Epidemiology. RB: (EPI 810 and EPI 826 and EPI 852)
Methods of analysis of time to event data parametric and nonparametric models, frailty models.

896  Advanced Methods in Epidemiology and Applied Statistics
Spring of even years, 3(3-0) Interdepartmental with Epidemiology. P:M: (EPI 826)
Pattern recognition and cluster analysis, longitudinal data analysis, path analysis, repeated measures and time-series analysis.

897  Asymptotic Theory
Fall of odd years, 3(3-0) RB: (STT 872)
Asymptotics of M- and R- estimators. Asymptotically efficient and adaptive procedures.

898  Semi-Nonparametric Inference
Fall of odd years, 3(3-0) RB: (STT 872)
Robust procedures in regression and time series settings, nonparametric curve estimation, survival analysis in non- and semi-parametric models.

899  Convergence of Measures and Stochastic Processes
Fall of even years, 3(3-0) RB: (STT 882)

900  Stochastic Analysis
Spring of even years, 3(3-0) RB: (STT 882)

901  Problems in Statistics and Probability
Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course. R: Approval of department.
Individual study on an advanced topic in statistics or probability.

902  Advanced Topics in Probability
Fall, Spring, Summer, 3(3-0) A student may earn a maximum of 15 credits in all enrollments for this course. RB: (STT 882) R: Approval of department.
Current topics in probability.

903  Advanced Topics in Statistics
Fall, Spring, Summer, 3(3-0) A student may earn a maximum of 15 credits in all enrollments for this course. RB: (STT 882) R: Approval of department.
Topics selected from non- and semi parametric statistics, multivariate analysis, time series analysis, Bayesian statistics, regression and kernel estimation, and other topics in advanced statistics.

904  Doctoral Dissertation Research
Fall, Spring, Summer. 1 to 24 credits. A student may earn a maximum of 120 credits in all enrollments for this course. R: Approval of department.
Doctoral dissertation research.

961  Convergence of Measures and Stochastic Processes
Fall of even years, 3(3-0) RB: (STT 882)
Casting
Fall, Spring. 3(0-6) P.M.: (STA 111 and STA 113 and STA 114)
Casting concepts and techniques as a means of artistic and cultural expression.

Construction and Fabrication
Fall, Spring. 3(0-6) P.M.: (STA 111 and STA 113 and STA 114)
Sculptural concepts using methods of construction and fabrication as an approach to artistic and cultural expression.

Graphic Design
Fall, Spring. 3(0-6) P.M.: (STA 111 and STA 113 and STA 114)
Graphic signs and symbols used in visual communication. Application of design principles to experimental and practical problem solving.

Photography
Fall, Spring. 4(2-4) P.M.: (STA 111 and STA 113 and STA 114)
History and basic technology of black and white photography, integrative camerawork, and darkroom processing. Issues in photographic aesthetics. Students furnish camera and all materials.

Art, Education and Society
Fall, Spring. 3(0-3) P.M. (HA 120 or HA 121) and completion of Tier I writing requirement.
Visual theory, learning theory, and social theory in historical and cultural contexts. Fieldwork and research-based written assignments.

Advanced Drawing
Fall, Spring. 4(0-8) P.M.: (STA 300)
Drawing with an emphasis on a wide range of current drawing concepts, materials, and techniques. Advanced non-representational drawing. Application to individual thematic development.

Painting
Fall, Spring. 4(0-8) A student may earn a maximum of 20 credits in all enrollments for this course. P.M.: (STA 325)
Advanced applications of painting concepts, styles and techniques. Consideration of the language of contemporary painting.

Relief Printing
Fall, Spring. 4(0-8) A student may earn a maximum of 20 credits in all enrollments for this course. P.M.: (STA 300 or STA 320)
Theory and practice of relief prints including additive methods, intaglio and woodcut for artistic and cultural expression.

Screen Printing
Fall, Spring. 4(0-8) A student may earn a maximum of 20 credits in all enrollments for this course. P.M.: (STA 300 or STA 320)
Screen printing as a fine art print medium. Theory and techniques as a means to creative and expressive imagery.

Lithography
Fall, Spring. 4(0-8) A student may earn a maximum of 20 credits in all enrollments for this course. P.M.: (STA 300 or STA 320)
Lithographic process as an artistic medium. Techniques of the medium. Preparing the plate or stone, printing, and using tusche, wash and rubbing as a means to creative imagery.

Intaglio
Fall, Spring. 4(0-8) A student may earn a maximum of 20 credits in all enrollments for this course. P.M.: (STA 300 or STA 320)
Aesthetic principles and techniques such as line etching, soft ground, aquatint, dry point, wax resist, collograph, and monoprints.

Ceramics
Fall, Spring. 4(0-8) A student may earn a maximum of 20 credits in all enrollments for this course. P.M.: (STA 345)
Development of aesthetic and technical skills with particular focus on contemporary issues of content and concept. Includes opportunity for supervised individual study.

Advanced Sculpture
Fall, Spring. 3(2-2) A student may earn a maximum of 20 credits in all enrollments for this course. P.M.: (STA 350 or STA 351 or STA 354 or STA 355) RB: 300-level sculpture course.
Advanced applications of sculpture concepts, styles and techniques. Consideration of the language of contemporary sculpture, with emphasis on individual direction.

Graph Communication
Fall, Spring. 4(0-8) P.M.: (STA 462 or STA 463 or STA 464 or STA 465 or STA 466 or STA 467 or STA 468) RB: and one other 400 level graphic design course.
Graphic design for visual communication based on typographic problem solving. Selected experimental and practical projects.

Book Design
Fall, Spring. 4(0-8) P.M.: (STA 360)
Principles of typography and graphic design as applied to the book form.

Design Process and Concepts
Fall, Spring. 4(0-8) P.M.: (STA 360)
Problem solving methods, strategies, and procedures. Exploration of problem definition, analysis, concept development, and evaluation.

The Poster
Fall, Spring. 4(0-8) P.M.: (STA 360)
Poster design as a combined verbal and non-verbal communication device. Visual elements used to persuade and inform.

Corporate Imagery
Fall, Spring. 4(0-8) P.M.: (STA 360)
Design development, hierarchical unification, and application strategies for the graphic identification of organizations and sub-units of organizations.

Motion Graphics and Electronic Media
Fall, Spring. 4(0-8) P.M.: (STA 360)
Non-print methods of visual communication. Computer- and video-based two-dimensional animation design.

Computer Graphics
Fall, Spring. 4(0-8) P.M.: (STA 360) The computer as a medium for visual communication design. Experimentation with drawing, painting and solid modeling applications.

Still Photography
Fall, Spring. 4(2-4) P.M.: (STA 370)
Control of black and white photographic materials through advanced camera and darkroom techniques. View camera principles and use. Print hand-coloring and archival processing. Contemporary form and content issues.

Color Photography
Spring. 4(2-4) P.M.: (STA 370)

Photography Studio Lighting
Fall. 4(2-4) P.M.: (STA 370)
The photographer’s balance of still life and portrait composition and controlled lighting with personal interpretation of subject matter. Lighting theory, technique, and equipment.

Photography Workshop
Spring. 4(1-6) P.M.: (STA 370)
Non-traditional photographic processes and concepts. Non-silver printmaking, electronic still imaging, computer manipulation, video production, and slide-sound productions.

Art Experiences with Children and Youth I
Fall. 9(1-8) P.M.: (STA 371) and completion of Tier I writing requirement. R: Open only to juniors or seniors in the Department of Art and Art History with a teacher certification option.
Art teaching in the Saturday Art Program. Emphasis on elementary experiences. Planning and writing art curriculum.

Art Experiences with Children and Youth II
Spring. 5(1-8) P.M.: (STA 371) Completion of Tier I writing requirement. R: Open only to juniors or seniors in the Department of Art and Art History with a teacher certification option.
Art teaching in the Saturday Art Program. Emphasis on secondary experiences. Planning and writing art curriculum.

Independent Study
Fall, Spring. 1 to 6 credits. A student may earn a maximum of 6 credits in all enrollments for this course. P.M.: Approval of department.
Special projects arranged by an individual student and a faculty member in areas supplementing regular course offerings.

Selected Topics - Painting
Spring. 2 to 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course. P.M.: (STA 320) R: Approval of department.
Issues of technique, style, and content in painting.

Selected Topics - Printmaking
Spring. 2 to 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course. P.M.: (STA 430 or STA 431 or STA 432 or STA 433) R: Approval of department.
Issues of technique, style, and content in printmaking.

Selected Topics - Ceramics
Spring. 2 to 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course. P.M.: (STA 345) R:
Issues of technique, style, and content in ceramics.
Studio Art—STA

491D Selected Topics - Sculpture
Spring. 2 to 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course. P.M.: (STA 350 or STA 351 or STA 354 or STA 355) R: Approval of department.
Issues of technique, style, and content in sculpture.

491E Selected Topics - Graphic Design
Spring. 2 to 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course. P.M.: (STA 360) R: Approval of department.
Issues of technique, style, and content in graphic design.

491F Selected Topics - Photography
Fall of odd years. 2 to 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course. RB: Art education major, education major, art education professionals. Contemporary issues in art education. Fieldwork, studio work, and research-based written assignments.

492 Senior Seminar and Professional Practice (W)
Fall, Spring. 2(2-0) P.M.: Completion of Tier I writing requirement. R: Open only to seniors in the Studio Art major. C: STA 492A concurrently.
Capstone course for artists and designers. Writing as a mode of issue delineation and definition.

492A Exhibition Practicum
Fall, Spring. 1(1-1) P.M.: Completion of Tier I writing requirement. C: STA 492 concurrently.

493 Design Internship
Fall, Spring. 1 to 4 credits. A student may earn a maximum of 4 credits in all enrollments for this course. P.M: (STA 460 or STA 462 or STA 463 or STA 464 or STA 465 or STA 466 or STA 467 or STA 468) RB: and one other 400 level graphic design course. R: Approval of department, contract required prior to registration.
Field experience in a working design environment under supervision of a design professional: art director, graphic designer, or photographer.

494 Design Center
Fall, Spring. 4(0-8) P.M.: (STA 460 or STA 462 or STA 463 or STA 464 or STA 465 or STA 466 or STA 467 or STA 468) RB: and one other 400 level graphic design course. R: Approval of department, contract required prior to registration.
Practicum in design problem solving, including extensive contact with selected clients at a professional level.

820 Painting
Fall, Spring. 2 to 8 credits. A student may earn a maximum of 40 credits in all enrollments for this course. R: Open only to Master of Fine Arts students in Studio Art. Approval of department.
Advanced study in a variety of painting media to foster independent development.

831 Screen Printing
Fall, Spring. 2 to 8 credits. A student may earn a maximum of 40 credits in all enrollments for this course. R: Open only to Master of Fine Arts students in Studio Art. Approval of department.
Theory and practice of screen printing as a means to create expressive imagery.

832 Lithography
Fall, Spring. 2 to 8 credits. A student may earn a maximum of 40 credits in all enrollments for this course. R: Open only to Master of Fine Arts students in Studio Art. Approval of department.
Theory and practice of lithography as a means to create expressive imagery.

833 Intaglio Printing
Fall, Spring. 2 to 8 credits. A student may earn a maximum of 40 credits in all enrollments for this course. R: Open only to Master of Fine Arts students in Studio Art. Approval of department.
Theory and practice of intaglio printing as a means to create expressive imagery.

840 Ceramics
Fall, Spring. 2 to 8 credits. A student may earn a maximum of 40 credits in all enrollments for this course. R: Open only to Master of Fine Arts students in Studio Art. Approval of department.
Advanced study in ceramics to foster independent development.

850 Sculpture
Fall, Spring. 2 to 8 credits. A student may earn a maximum of 40 credits in all enrollments for this course. R: Open only to Master of Fine Arts students in Studio Art. Approval of department.
Advanced study in a variety of three-dimensional media to foster individual development.

860 Graphic Design
Fall, Spring. 2 to 8 credits. A student may earn a maximum of 40 credits in all enrollments for this course. R: Open only to graduate students in Studio Art. Approval of department.
Planning and conceptualizing ideas for visual communication problems that are to be expressed in words and/or pictures. Design of research that will expose a mastery of visual aesthetics and concepts in information design.

891 Special Topics in Art Education
Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 3 credits in all enrollments for this course. R: Approval of department.
Special topics supplementing regular course offerings proposed by faculty on a group study basis for graduate students.

892 Master of Fine Arts Seminar
Fall. 3(3-0) A student may earn a maximum of 12 credits in all enrollments for this course. R: Open only to Master of Fine Arts students in Studio Art. Approval of department.
Contemporary intellectual issues related to practice in the visual arts. Group critiques of individual scholarly and applied research.

898 Master of Fine Arts Research
Fall, Spring. 1 to 8 credits. A student may earn a maximum of 16 credits in all enrollments for this course. RB: 12 graduate credits in student's studio art discipline. R: Open only to Master of Fine Arts students in Studio Art.
Individual research project in the student's studio art discipline directed by major professor.

SURGERY SUR

Department of Surgery
College of Human Medicine

608 Junior Surgery Clerkship
Spring, Summer. 6 to 12 credits. A student may earn a maximum of 12 credits in all enrollments for this course. RB: (FMP 602) R: Open only to graduate-professional students in the College of Human Medicine.
The surgical patient, surgical diagnosis, pre-operative evaluation and post-operative care.

609 Otolaryngology Clerkship
Fall, Spring, Summer. 6 credits. A student may earn a maximum of 18 credits in all enrollments for this course. RB: (SUR 608) R: Open only to graduate-professional students in College of Human Medicine.
Common otolaryngologic disorders, emergencies, diagnosis and treatment. Primary physician's judgments about management.

610 Plastic Surgery Clerkship
Fall, Spring, Summer. 6 credits. A student may earn a maximum of 18 credits in all enrollments for this course. RB: (SUR 608) R: Open only to graduate-professional students in College of Human Medicine.
Principles of wound healing and tissue repair. Indications and applications of plastic surgery procedures.

611 Urology Clerkship
Fall, Spring, Summer. 6 credits. A student may earn a maximum of 18 credits in all enrollments for this course. RB: (SUR 608) R: Open only to graduate-professional students in College of Human Medicine.
Demonstration of clinical manifestations of genitourinary disease, investigative methods and techniques of diagnosis and management. Urologic emergencies and performance of basic urologic skills.