

470 Theory and Practice in Community and Economic Development
 Spring. 3(3-0) Interdepartmental with Resource Development; Environmental Economics and Policy. Administered by Department of Resource Development. R: Open only to juniors or seniors. SA: PRM 470

Concepts, principles, models, and skills for community and economic development. Community participation in local development initiatives.

475 Sociology of Health Care Systems
 Spring. 3(3-0) R: Not open to freshmen or sophomores.

Organizations, professions and institutions of health care systems. Provider-patient relationships. Social epidemiology. Socioeconomic factors influencing access. International comparisons.

476 Social Psychology of Health
 Fall. 3(3-0)

Social psychological aspects of health and health care behavior. Mental health and stress. Patient-provider behavior. Role relationships.

481 Intentional Social Change
 Fall. 3(3-0) R: Not open to freshmen or sophomores.

Directions, sources, processes, patterns, and consequences of planned social change. Factors stimulating or hindering acceptance and success of designed social change.

488 Sociological Theory (W)
 Fall. 3(3-0) P:M: Completion of Tier I writing requirement. RB: 12 credits in sociology.

Development of sociological theory. Problems of theory construction. Current theoretical perspectives.

490 Special Topics in Sociology
 Fall, Spring. 3(3-0) A student may earn a maximum of 9 credits in all enrollments for this course. R: Open only to juniors or seniors in the Department of Sociology.

Experimental courses and courses taught by visiting scholars.

496 Individual Readings
 Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course. RB: 9 credits in Sociology. R: Approval of department.

Supervised individual readings and study in sociology.

497 Individual Research
 Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course. RB: 9 credits in Sociology. R: Approval of department.

Supervised individual research in sociology.

498 Sociology Internship
 Fall, Spring, Summer. 3(3-0) RB: 9 credits in Sociology. R: Approval of department.

Practical experience with a public, private, or non-profit organization.

499 Social Issues and Change in Contemporary Society (W)
 Fall, Spring. 3(3-0) P:M: Completion of Tier I writing requirement. R: Open only to seniors in the Department of Sociology.

Selected major social problems in contemporary societies. Sources and consequences of social change. Application of sociological theory to selected cases.

SPANISH SPN

Department of Spanish and Portuguese College of Arts and Letters

101 Elementary Spanish I
 Fall, Spring, Summer. 4(4-1) Not open to students with credit in SPN 150.

Practice in using and understanding Spanish to develop listening, speaking, reading, and writing skills. Pronunciation, grammar, vocabulary, and cultural topics.

102 Elementary Spanish II
 Fall, Spring. 4(4-1) P:M: (SPN 101) or designated score on Spanish placement test. Not open to students with credit in SPN 150.

Further practice in using and understanding Spanish to develop listening, speaking, reading, and writing skills. Pronunciation, grammar, vocabulary, and cultural topics.

150 Intensive Review of Elementary Spanish
 Fall, Spring. 5(5-1) P:M: Designated score on Spanish placement test. RB: Two years of high school Spanish or equivalent. R: Open to students with high school credit in Spanish. Not open to students with credit in SPN 101 or SPN 102.

Intensive review of elementary-level Spanish for students who have had at least two years of Spanish at the secondary-level and who need to strengthen communication skills and knowledge of Spanish language and culture.

201 Second Year Spanish I
 Fall, Spring. 4(4-0) P:M: (SPN 102 or SPN 150) or designated score on Spanish placement test.

Intermediate-level review and development of aural comprehension, speaking, reading, and writing skills. Topics in the cultures of the Spanish-speaking world.

202 Second-Year Spanish II
 Fall, Spring. 4(4-0) P:M: (SPN 201) or designated score on Spanish placement test.

Further review and development of aural comprehension, speaking, reading, and writing skills. Topics in the cultures of the Spanish-speaking world.

250 Intensive Intermediate Spanish
 Fall, Spring. 6(5-2) P:M: (SPN 150 or SPN 102) or designated score on Spanish placement test. RB: Study Abroad experience in a Spanish-speaking country R: Approval of department. Not open to students with credit in SPN 201 or SPN 202.

Intensive accelerated intermediate-level Spanish. Development of aural comprehension, speaking, reading and writing skills. Topics in the cultures of the Spanish-speaking world. Strengthen communication skills and cross-cultural understanding.

290 Independent Study
 Fall, Spring. 1 to 4 credits. A student may earn a maximum of 4 credits in all enrollments for this course. R: Approval of department.

Special projects at the intermediate level arranged by an individual student and supervised by a faculty member in areas supplementing, but not replacing, regular course offerings.

310 Basic Spanish Grammar
 Fall, Spring. 3(3-0) P:M: (SPN 202 or SPN 250) or designated score on Spanish placement test.

Instruction and practice in the basic structural patterns of Spanish.

320 Cultural Readings and Composition (W)
 Fall, Spring. 3(3-0) P:M: (SPN 310) and completion of Tier I writing requirement.

Readings from texts that discuss or embody Hispanic culture, and writing based on those readings.

330 Phonetics and Pronunciation
 Fall, Spring. 3(3-0) P:M: (SPN 202 or SPN 250) or designated score on Spanish placement test.

Phonetic description of the sound system of Spanish, developed linguistically and applied to the improvement of pronunciation and spoken Spanish.

342 Media and Conversation
 Fall, Spring. 3(3-0) SA: SPN 340 C: SPN 330 concurrently.

Discussion in Spanish via journalistic and entertainment media and exposure.

350 Introduction to Reading Hispanic Literature (W)
 Fall, Spring. 3(3-0) P:M: (SPN 320) and completion of Tier I writing requirement.

Close reading of poetry, drama, and prose.

412 Topics in Hispanic Culture
 Fall of even years. 3(3-0) P:M: (SPN 320) SA: SPN 410

Analysis of diverse forms of cultural expression in the Spanish-speaking world.

420 Spain and its Literature
 Fall, Spring. 3(3-0) P:M: (SPN 350)

Survey of literature written in Spain from the Middle Ages to the present.

432 Latin America and its Literature
 Fall, Spring. 3(3-0) P:M: (SPN 350)

Survey of literature written in Spanish-speaking Latin America from the Colonial Period to the present.

440 The Structure of Spanish
 Fall, Spring. 3(3-0) P:M: (SPN 330) and (LIN 200 and LIN 401 and ROM 401 and ENG 302)

Overview of linguistic approaches to understanding the Spanish language.

452 Topics in Spanish Language
 Fall, Spring. 3(3-0) A student may earn a maximum of 9 credits in all enrollments for this course. P:M: (320 and 330 and 340) SA: SPN 450

Improvement of language skills through applied practice.

462 Topics in Spanish Literature
 Fall. 3(3-0) A student may earn a maximum of 9 credits in all enrollments for this course. P:M: (SPN 420) SA: SPN 460

Thematic topics in Spanish literature.

472 Topics in the Literatures of the Americas
 Spring. 3(3-0) A student may earn a maximum of 9 credits in all enrollments for this course. P:M: (SPN 432) SA: SPN 470

Thematic topics in the literature of the Spanish-speaking Americas.

Spanish—SPN

482 Topics in Spanish Linguistics
Fall of odd years. 3(3-0) A student may earn a maximum of 9 credits in all enrollments for this course. P:M: (SPN 440) SA: SPN 480
Advanced study of the structure and usage of Spanish.

490 Independent Study
Fall, Spring. 1 to 4 credits. A student may earn a maximum of 9 credits in all enrollments for this course. R: Approval of department.

Special project at the advanced level arranged by an individual student and supervised by a faculty member in an area supplementing, but not replacing, regular course offerings.

491 Special Topics in Spanish
Fall, Spring, Summer. 3(3-0) A student may earn a maximum of 6 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.

492 Senior Writing Project
Fall, Spring, Summer. 1(1-0) R: Open only to seniors in Spanish.

Research and preparation of a paper on an interdisciplinary subject that synthesizes at least three areas of a major's undergraduate education. Students work under the supervision of a faculty member.

STATISTICS AND PROBABILITY STT

Department of Statistics and Probability College of Natural Science

200 Statistical Methods
Fall, Spring, Summer. 3(4-0) P:M: (MTH 103 or MTH 110 or MTH 116 or MTH 124 or MTH 132 or LBS 117 or LBS 118) or designated score on Mathematics placement test. Not open to students with credit in STT 201 or STT 315 or STT 421.

Data analysis, probability models, random variables, estimation, tests of hypotheses, confidence intervals, and simple linear regression.

201 Statistical Methods
Fall, Spring, Summer. 4(3-2) P:M: (MTH 103 or MTH 110 or MTH 116 or MTH 124 or MTH 132 or LBS 117 or LBS 118) or designated score on Mathematics placement test. Not open to students with credit in STT 200 or STT 315 or STT 421.

Probability and statistics with computer applications. Data analysis, probability models, random variables, tests of hypotheses, confidence intervals, simple linear regression. Weekly lab using statistical software.

231 Statistics for Scientists
Fall, Spring. 3(3-0) P:M: (MTH 124 or MTH 132 or MTH 152H or LBS 118) R: Open only to students in College of Natural Science. SA: STT 331

Calculus based course in probability and statistics. Probability models, random variables. Estimation, confidence intervals, tests of hypotheses, simple linear regression with applications in sciences.

290 Topics in Statistics and Probability
Fall, Spring, Summer. 1 to 3 credits. RB: (MTH 103) R: Approval of department.
Individualized study of selected topics.

315 Introduction to Probability and Statistics for Business
Fall, Spring, Summer. 3(4-0) P:M: (MTH 124 or MTH 132 or MTH 152H or LBS 118) Not open to students with credit in STT 200 or STT 201 or STT 421.

A first course in probability and statistics primarily for business majors. Data analysis, probability models, random variables, confidence intervals, and tests of hypotheses with business applications.

317 Quantitative Business Research Methods
Fall, Spring, Summer. 3(3-1) Interdepartmental with Marketing and Supply Chain Management. Administered by Department of Marketing and Supply Chain Management. P:M: (STT 315) R: Open only to juniors or seniors in The Eli Broad College of Business. Not open to students in The School of Hospitality Business. SA: ML 317, MTA 317

Application of statistical techniques, including forecasting, to business decision making. Includes applications of linear regression and correlation, analysis of variance, selected non-parametric tests, time series, and index numbers.

351 Probability and Statistics for Engineering
Fall, Spring, Summer. 3(3-0) P:M: (MTH 234 or MTH 254H or LBS 220) R: Open only to juniors or seniors. Not open to students with credit in STT 430.

Probability and statistics for engineering majors. Probability models and random variables. Estimation, confidence intervals, tests of hypotheses, simple linear regression. Applications to engineering.

421 Statistics I
Fall, Spring, Summer. 3(3-0) RB: (MTH 103 or MTH 110 or MTH 116 or LBS 117) Not open to students with credit in STT 200 or STT 201 or STT 315.

Basic probability, random variables, and common distributions. Estimation and tests for one-, two-, and paired sample problems. Introduction to simple linear regression and correlation, 1-way ANOVA.

422 Statistics II
Fall, Spring, Summer. 3(3-0) RB: (STT 421) Not open to students with credit in STT 464.

Goodness of fit and other non-parametric methods. Linear models including multiple regression and ANOVA for simple experimental designs.

430 Introduction to Probability and Statistics
Fall. 3(3-0) RB: (MTH 126 or MTH 133 or MTH 153H or LBS 119) R: Open only to majors in the Department of Economics or Department of Agricultural Economics. Not open to students with credit in STT 351.

Calculus based probability and statistics with applications. Discrete and continuous random variables and their expectations. Point and interval estimation, tests of hypotheses, simple linear regression.

441 Probability and Statistics I: Probability
Fall, Spring, Summer. 3(3-0) RB: (MTH 234 or MTH 254H or LBS 220)

Probability models and basic statistics at an intermediate mathematical level. Discrete, continuous, univariate, and multivariate distributions. Random variables. Normal approximation. Sampling distributions, parameter estimation, and elementary tests of hypotheses.

442 Probability and Statistics II: Statistics
Spring. 3(3-0) RB: (STT 441 and MTH 314)
Estimation, tests of hypotheses, confidence intervals. Goodness of fit, non-parametric methods. Linear models, multiple regression, ANOVA.

455 Actuarial Models
Spring. 3(3-0) Interdepartmental with Mathematics. RB: (STT 441)
Stochastic models used in insurance. Survival distributions, life insurance, life annuities, benefit premiums, benefit reserves, analysis of benefit reserves.

461 Computations in Probability and Statistics
Spring. 3(3-0) RB: (CSE 131 or CSE 230) and (MTH 314 and STT 441)

Computer algorithms for evaluation, simulation and visualization. Sampling and prescribed distributions. Robustness and error analysis of procedures used by statistical packages. Graphics for data display, computation of probabilities and percentiles.

464 Statistical Methods for Biologists I
Fall. 3(3-0) Interdepartmental with Animal Science; Crop and Soil Sciences. RB: (STT 421)

Biological random variables. Estimation of population parameters. Testing hypotheses. Linear correlation and regression (prediction). Analyses of counted and measured data to compare several biological groups (contingency tables and analysis of variance).

465 Statistical Methods for Biologists II
Spring. 3(3-0) Interdepartmental with Animal Science; Crop and Soil Sciences. RB: (STT 464)

Concepts of reducing experimental error: covariance, complete and incomplete block designs, latin squares, split plots, repeated-measures designs, regression applications, and response surface designs.

466 Spatial Data Analysis
Spring. 4(3-2) Interdepartmental with Geography. Administered by Department of Geography. P:M: (GEO 463 or STT 200 or STT 201 or STT 231 or STT 315 or STT 351) RB: Basic computer skills, basic mathematics, basic statistics, geographic information science.

Theory and techniques for statistical analysis of point patterns, spatially continuous data, and data in spatial zones.

471 Statistics for Quality and Productivity
Fall of even years. 3(3-0) RB: (STT 351 or STT 422 or STT 442)

Scientific context of quality: Box, Deming, Taguchi. Graphical techniques, control charts. Design of experiments: factorials and fractional factorials, confounding and aliasing. Engineering parameter design through experimentation.

481 Issues in Statistical Practice
Spring. 1(1-0) P:M: Completion of Tier I writing requirement. R: Open only to seniors in the Department of Statistics.

Selected readings and projects illustrating special problems encountered by professional statisticians in their roles as consultants, educators, and analysts.