

569. Advanced Virtual Manufacturing. 4 Hours. Same as ME 569. Manufacturing systems design optimization using virtual environments, optimization of manufacturing decision support using virtual reality interfaces, analysis and evaluation of virtual environments. Prerequisite: Consent of the instructor.

571. Statistical Quality Control and Assurance. 4 Hours. Same as IDS 571. The importance of quality in products and services, quality surveillance, Deming's management method, Ishikawa's seven tools, control charts, acceptance sampling, quality improvement using directed experiments. Prerequisite: At least one term of statistics.

575. Advanced Optimization Techniques I. 4 Hours. Same as IDS 545. Theoretical foundations of linear and integer programming; convex sets; linear inequalities; linear programming theory and algorithms; integer programming; applications in production scheduling and inventory control. Prerequisites: Math 413 and 310 and IDS 435 or IE 471 or Math 461.

576. Advanced Optimization Techniques II. 4 Hours. Same as IDS 546. Nonlinear programming; optimality conditions; convex programming; Rockefeller and Lagrange duality; algorithms and numerical methods; applications to engineering design and economics. Prerequisite: IE 575.

594. Current Topics in Industrial Engineering. 4 Hours. May be repeated for credit. Particular topics vary from term to term depending on the interests of the students and the specialties of the instructor. Prerequisite: Consent of the instructor.

595. Seminar on Industrial Engineering Research. 1 Hour. S/U grade only. Advances in industrial engineering research will be discussed in a seminar setting. Students will be expected to make presentations in various areas, as well as invited faculty speakers. Prerequisite: Graduate standing in industrial engineering.

596. Independent Study. 1 to 4 Hours. May be repeated for a maximum of 4 hours of credit. Students may register for more than one section per term. Individual study under close supervision of a faculty member. Prerequisite: Consent of the instructor.

598. MS Thesis Research. 0 to 16 Hours. May be repeated for credit. S/U grade only. Individual research in specialized problems under close faculty supervision. Prerequisite: Consent of the instructor.

599. PhD Thesis Research. 0 to 16 Hours. May be repeated for credit. S/U grade only. Individual research on specialized problems under close faculty supervision. Prerequisite: Consent of the instructor.

Information and Decision Sciences (IDS)

400. Advanced Business Programming Using Visual Tools. 4 Hours. Visual extended business language capabilities, including creating and using controls, menus and dialogs, objects and instances, mouse events, graphics, file-system controls. Prerequisite: IDS 201 or a programming course in mathematics or computer science, or consent of the instructor.

401. Business Computing II: Data Structures and Operating Systems. 4 Hours. Data structures; file structures. Searching and sorting; algorithm design and analysis. Operating systems; process management; memory management; processor management; file systems; case studies; programming projects. Prerequisite: IDS 201.

405. Business Systems and Analysis Design. 4 Hours. Theory of analysis, design and development of information systems; information management and database management systems; data management and analysis; case studies in systems implementation and evaluation. Prerequisites: IDS 100 and 201 and credit or concurrent registration in IDS 410 or the equivalent courses.

406. Business Systems Design Project. 4 Hours. Selected issues in the design, development, and evaluation of computer-based business information systems: forms design, general software systems, users interfaces, research systems, quality control, and documentation standards. Includes a project at an outside company or University office. Prerequisites: IDS 201 and 405 or the equivalent courses; or consent of the instructor. Business administration students must have declared a major.

410. Business Database Design. 4 Hours. Computer software techniques used in business with emphasis on information management and database management systems. Data management and analysis. Major types of database management systems, query languages. Prerequisite: IDS 100 and 201 or the equivalent courses.

412. Distributed Business Systems. 4 Hours. Organizational aspects and underlying concepts of distributed business systems, decentralization versus centralization issues, costs of distributed computing, and performance evaluation measures. Prerequisite: IDS 400 or 401 and credit or concurrent registration in IDS 410; or consent of the instructor.

420. Business Systems Simulation. 4 Hours. Simulation analysis of the operations of a system from the perspective of the entire company; optimal decisions are generated for the controllers of the systems. Prerequisites: IDS 201 and IDS 355 and Math 205 or the equivalent courses.

422. Decision Support and Expert Systems. 4 Hours. Judgement, knowledge, and experience-based systems; components of decision support systems (DSS) and expert-systems (ES); languages and tools for development of DSS/ES: active decision and problem-solving support in semi-structured or unstructured situations; hands-on experience. Prerequisite: IDS 355 and 410 or consent of the instructor.

426. Computer Performance Evaluation and Modeling. 4 Hours. Probabilistic, simulation, and statistical techniques for modeling computer systems with a view to evaluating their performance. Models of multiprogramming systems, multi-access systems, input/output systems, scheduling algorithms, and paging systems are described. Prerequisites: IDS 371 and either IDS 405 or 410, and a business core computer language course, or the equivalents, or consent of the instructor. Credit in IDS 420, while not required, is recommended. Business administration students must have declared a major.

435. Operations Research I. 4 Hours. Linear programming, simplex algorithm, duality, sensitivity analysis, convex programming, parametric programming. Transportation and assignment problems, goal programming. Prerequisites: IDS 355, and Math 205 or the equivalent. Business administration students must have declared a major.

436. Operations Research II. 4 Hours. Nonlinear operations research. Nonlinear programming: optimality conditions, convexity, heuristic methods, applications. Inventory control theory: classical models, stochastic complications. Integer programming: enumerative techniques, cutting plane techniques. Prerequisite: IDS 435 or the equivalent, or consent of the instructor. Business administration students must have declared a major.

437. Operations Research III. 4 Hours. Markov chains, queueing theory, stochastic inventory control theory, dynamic programming. Prerequisites: IDS 355 and Math 205 or the equivalent. Business administration students must have declared a major.

446. Decision Analysis. 4 Hours. Prior and posterior distributions, conjugate priors, value of information, applications to decision making in business. Prerequisite: IDS 371.

450. Operations Management II. 4 Hours. Extensive computer use required. Application of management science to the operation and control of production, distribution, and service systems. Emphasis on inventory management, production planning, capacity expansion, and demand forecasting. Prerequisite: IDS 355 or the equivalent. Business administration students must have declared a major.

454. Supply Chain Management. 4 Hours. Supply Chain Management is studied as an information-intensive, integrated system for managing material flows, logistics and inter-organizational partnership to deliver products and services. Prerequisite: IDS 450.

460. Survey Sampling: Theory and Methods. 4 Hours. Planning and analyzing surveys. Topics include simple random sampling, stratified sampling, systematic sampling, ratio estimation and cluster sampling. Case studies with applications to real situations are discussed. Prerequisite: IDS 371.

462. Statistical Software for Business Applications. 4 Hours. Statistical software in business applications and data mining. SAS and other packages such as SPSS, MATLAB, Maple, Splus, B34S, SCA. Prerequisite: IDS 371 or consent of the instructor.

465. Analysis of Variance and Experimental Design. 4 Hours. General theory of design and analysis of experiments. Least squares estimation, multiple regression, analysis of variance, randomization, randomized blocks, Latin squares, factorial designs, replication, incomplete blocks. Prerequisites: IDS 371; and Math 205 or 310 or 320.

470. Multivariate Analysis I. 4 Hours. Introduction to the structure and analysis of multivariate data. Emphasis on the multivariate normal model. Regression, tests concerning multivariate means,

classification, discriminant analysis, principal components.
Prerequisites: IDS 371; and Math 205 or 310 or 320.

472. Statistical Methods for Mgmt Information Systems & Data Mining. 4 Hours. Updating statistical databases. Cluster analysis, logistic regression, classification and regression trees, neural networks, path analysis. Applications to marketing, quality assurance, operations management, human resources management. Prerequisite: IDS 371 or the equivalent.

474. Quality and Productivity Improvement Using Statistical Methods. 4 Hours. Directed experimentation for quality and productivity improvement, quality surveillance, design and analysis of two-level factorial experiments and multilevel experiments, data transformation. Prerequisite: IDS 371 or consent of the instructor.

476. Business Forecasting Using Time Series Methods. 4 Hours. Same as Econ 450. Autoregressive, moving average, and seasonal models for time series analysis and business forecasting. Forecasting using multivariable transfer function models is also included. Prerequisite: IDS 371 or Econ 445 or consent of the instructor.

478. Regression Analysis. 4 Hours. Data collection and exploration; model building; variable least squares; residual analysis; variable selection; multicollinearity; ridge regression; nonlinear regression; nonparametric regression. Prerequisite: IDS 371.

480. Cluster Analysis with Applications in Business. 4 Hours. Clustering individuals. Clustering variables. Block clustering. Empirical investigations. Applications of cluster analysis on market research, stock market analysis, or other fields. Prerequisite: IDS 371 or consent of the instructor.

494. Topics in Information and Decision Sciences. 3 Hours. May be repeated for a maximum of 8 hours of credit. Students may register for more than one section per term. Topics vary, selected readings, case analysis. Prerequisite: Consent of the instructor.

495. Competitive Strategy. 4 Hours. Multidisciplinary analysis of organizational strategy and policy using case method and/or business simulation. Assignments involve extensive library research and oral and written reports. Prerequisite: Consent of the instructor.

499. Independent Study in Information and Decision Sciences. 1 to 3 Hours. May be repeated for a maximum of 9 hours of credit. Intensive study of selected topics determined in consultation with the instructor and department head. Prerequisites: Major in information and decision sciences and consent of the instructor.

500. Information Technology for Management. 4 Hours. Use of information technology in business; planning, management, and strategic use of information technology including the role of enterprise-wide systems, the Internet, and electronic commerce. Prerequisite: Admission to the MBA Program.

504. Introduction to Electronic Commerce. 4 Hours. Addresses issues on electronic commerce for businesses and consumers, considering topics such as competition, distribution, infrastructure on the Internet, shopping, and product characteristics.

505. Business Information Systems Analysis and Design. 4 Hours. A student who has taken IDS 405 must see an adviser to determine whether another graduate course from IDS, Math, or Computer Science must be substituted for IDS 505. Analysis, design and development of information systems. Management concerns in systems design, development, and evaluation. Includes a project at an outside company or University office. Prerequisite: IDS 500; or consent of the instructor.

507. Advanced Systems Analysis and Design Project. 4 Hours. Principles and concepts of analysis, design and development of information systems including project management. Includes a project at an outside company or University office. Prerequisite: Consent of the instructor, and completion of three MS in MIS courses.

508. E-Commerce Project. 4 Hours. Electronic commerce project initiated by local small and medium enterprises, teaming students with technical or entrepreneurial skills/interests, supervised by faculty on board of directors. Prerequisites: IDS 504 or Mgmt/Mktg 558 and consent of the instructor.

509. Advanced Systems Analysis and Design. 4 Hours. Principles and concepts of analysis, design and development of information systems using structured and object oriented methodologies, tools and techniques. Prerequisite: IDS 401.

510. Administrative Computer Technology. 4 Hours. A student who has taken IDS 410 must see an adviser to determine whether another graduate course from IDS, Mathematics, or CS must be substituted for IDS 510. Software technology as used in business, emphasizing information management and database systems. Data management, data analysis, major types of database systems, query languages, security, and control. Applications to business systems. Prerequisite: IDS 500.

511. Query Processing in Database Systems. 4 Hours. Same as CS 580. Query processing in deductive databases and in distributed/parallel databases systems. Prerequisite: CS 480.

514. Management of Information Systems. 4 Hours. Administration, control, and management of computer-based information systems, projects, and relationships with the organization. Scheduling of operations; management of computer professionals; planning and control of the systems activity. Prerequisite: IDS 505 or IDS 510.

516. Planning Models and Decision Support Systems. 4 Hours. Analysis, design and development of decision support systems. Managerial and behavioral concerns in decision support system design, development and evaluation. Prerequisite: IDS 505 or IDS 510.

518. Electronic Marketing. 4 Hours. Same as Mktg 518. Overview of the electronic marketing value chain. Internet and web technologies, system design, payment systems, business requirements for e-marketing, design and ethical issues. Prerequisite: Mktg 500 or MBA 506 or consent of the instructor.

519. Topics in Information Systems. 4 Hours. May be repeated for credit. Selected topics in information systems, information management and information technology. Content varies. Topics will be announced. Prerequisites: IDS 505 or IDS 510; and consent of the instructor.

520. Distributed Processing and Telecommunication Systems. 4 Hours. Topics include components of telecommunications and distributed information systems, data communication devices, computer networks, configuration management and distributed databases. Prerequisite: IDS 505 or IDS 510.

521. Advanced Database Management. 4 Hours. Data analysis for database design; logical data modeling, transaction modeling; implementation models; physical database design; database tuning and performance evaluation; database decomposition; distributed database; database security. Prerequisite: IDS 505 or IDS 510.

522. Expert Systems for Business Applications. 4 Hours. Components of expert systems; languages and tools for development of expert systems; representation of business knowledge such as marketing, accounting, and finance. Prerequisite: IDS 505 or IDS 510.

523. Audit and Control of Information Systems. 4 Hours. Modeling and analysis of information systems application in organizations; measurement of effectiveness; strategies for implementation and updating; interface with other management control systems. Prerequisite: IDS 505 or IDS 510.

526. Computer Performance Evaluation and Modeling. 4 Hours. A student who has taken IDS 426 must see an adviser to determine whether another graduate course from IDS, Mathematics, or CS must be substituted for IDS 526. Probabilistic, simulation and statistical techniques for modeling computer systems with a view to evaluating their performance. Models of multi-programming systems, multi-access systems input/output systems, priority queues, and paging systems. Prerequisites: IDS 532; and IDS 505 or IDS 510.

527. Seminar on System Development and Management. 4 Hours. May be repeated for credit. Current topics in system development and management. Topics vary from term to term depending on the interests of the instructor and students. Prerequisites: IDS 505 and consent of the instructor.

528. Seminar on Database Design. 4 Hours. May be repeated for credit. Selected topics in logical and physical database modeling and design. Topics vary. Prerequisite: Consent of the instructor.

529. Seminar on Management Information Systems. 4 Hours. May be repeated for credit. Special research topics in management information systems. Topics vary from term to term depending on the interests of the instructor and students. Prerequisite: IDS 505 or IDS 510.

532. Decision Models and Information Systems II. 4 Hours. Credit is not given for IDS 532 if the student has credit in

MBA 507 and 509. MBA core course that integrates decision sciences and information systems. Emphasizes forecasting and decision models. Prerequisite: Admission to the MBA Program.

545. Advanced Optimization Techniques I. 4 Hours.

Same as IE 575. Theoretical foundations of linear and integer programming; convex sets; linear inequalities; linear programming theory and algorithms; integer programming; applications in production scheduling and inventory control. Prerequisites: Math 413 and 310 and IDS 435 or IE 471 or Math 461.

546. Advanced Optimization Techniques II. 4 Hours.

Same as IE 576. Nonlinear programming; optimality conditions; convex programming; Rockefeller and Lagrange duality; algorithms and numerical methods; applications to engineering design and economics. Prerequisite: IDS 545.

547. Applied Stochastic Processes II. 4 Hours. Same as IE 552. Stationary point processes; Markov renewal theory; semi-Markov processes; regenerative processes; computational methods and applications to queues, inventories, dams, and reliability. Prerequisite: IE 550.

551. Operations Management in the Service Sector. 4 Hours. Comparison of service and manufacturing operations; analysis of effects of capacity, quality, and service firm life cycle on operations. Prerequisite: Credit or concurrent registration in IDS 532, or consent of the instructor.

552. Inventory Management. 4 Hours. Structure of inventory decision and operating procedures; single event and continuous systems for both single and multiple products; order quantity and periodic review models; demand forecasting. Prerequisite: Credit or concurrent registration in IDS 532, or consent of the instructor.

553. Production Management and Control. 4 Hours.

Project scheduling and resource allocation; capacity planning; aggregate planning, scheduling and dispatching; plant layout; material requirement planning; production flow and line balancing. Prerequisite: IDS 532.

570. Statistics for Management. 4 Hours. Survey of statistical methods with applications for business and management. Prerequisite: Admission to any business graduate program or consent of the instructor.

571. Statistical Quality Control and Assurance. 4 Hours.

Same as IE 571. The importance of quality in products and services, quality surveillance, Deming's management method, Ishikawa's seven tools, control charts, acceptance sampling, quality improvement using directed experiments. Prerequisite: At least one term of statistics.

577. Research Methodology I. 4 Hours. Use of statistics and computers in research. Data collection and organization, survey sampling, questionnaire design, experimental design. Prerequisites: IDS 532 or the equivalent and admission to the PhD program in Business Administration.

578. Research Methodology II. 4 Hours. Data analysis, including estimation, hypotheses testing, nonparametric methods, analysis of variance, regression analysis, economic forecasting, and time series. Prerequisite: IDS 577 or the equivalent.

582. Business Research and Forecasting I. 4 Hours.

Same as Econ 537. The role of research in business; forecasting methods and techniques, including models and their applications. Prerequisites: Econ 534 and at least one statistics course with regression analysis at the 300-level or above.

583. Business Research and Forecasting II. 4 Hours.

Same as Econ 538. The role of research in business; forecasting methods and techniques, including multivariate time series models and their applications. Prerequisite: IDS 476 or 582.

594. Special Topics in Information and Decision Sciences. 4 Hours.

Intensive study of a selected topic. Content varies. Topics are announced. Prerequisite: Consent of the instructor.

596. Independent Study in Information and Decision Sciences. 1 to 4 Hours.

Students may register for more than one section per term. Independent study under the direction of a faculty member. Prerequisite: Consent of the instructor.

599. PhD Thesis Research. 0 to 16 Hours.

S/U grade only. May be repeated for credit. Students may register for more than one section per term. Research on topic of the doctoral dissertation. Prerequisite: Consent of the instructor.

Interdisciplinary Public Health (IPHS)

420. Resource Databases in Public Health. 1 Hour. S/U grade only. Use of print and electronic data bases of the U.S. Public Health Service, including CDC and NCHS and health care bibliographic databases.

440. Public Health Practices. 3 Hours. Explores in detail one major Illinois public health problem, utilizing community public health leaders as instructors.

464. Introduction to Injury Control. 2 Hours. Public health aspects of injury control. Pre-event: human-environment interactions; event: biomechanics, protective techniques; post-event: emergency medical systems, injury assessment; societal costs; legal and policy aspects. Prerequisite: Epid 400 or Bstt 400 or another graduate-level course in statistics or consent of the instructor.

494. Introductory Special Topics—Interdepartmental. 1 to 4 Hours. May be repeated for credit. Students may register for more than one section per term. Introductory special topics in public health. Course content will vary from semester to semester.

530. Practicum in Mental Health Diagnosis. 4 to 8 Hours. Review of mental health diagnostic process. Students in psychosocial epidemiology participate with medical students in a psychiatry clerkship. Prerequisites: CHSc 460 and consent of the instructor.

540. Advanced Public Health Practices. 3 Hours.

Develop a proposal for the solution or alleviation of the public health problem studied in IPHS 440 by a team of health professionals, faculty, and students. Prerequisite: IPHS 440.

594. Advanced Special Topics—Interdepartmental. 1 to 4 Hours. May be repeated for credit. Students may register for more than one section per term. Advanced special topics in public health. Course content will vary from semester to semester.

595. Seminar in Interdisciplinary Public Health Sciences. 1 to 3 Hours.

May be repeated for credit. Students may register for more than one section per term. S/U grade only. Analysis of current research in public health. Course content will vary from semester to semester. Prerequisite: Consent of the instructor.

596. Independent Study in Public Health. 1 to 4 Hours.

May be repeated for credit. Students may register for more than one section per term. Selected aspects of specific public health problems; independent study under close supervision of faculty. Prerequisite: Consent of instructor who has supervised at least one course in the area of the independent study.

598. Research in Public Health Sciences—MS 0 to 16 Hours.

May be repeated for credit. Students may register for more than one section per term. S/U grade only. Individual research in public health directed by a faculty member. Directed toward the thesis requirements for the Master of Science degree. Prerequisite: Consent of the instructor.

599. Research in Public Health Sciences—PhD 0 to 16 Hours.

May be repeated for credit. Students may register for more than one section per term. S/U grade only. Individual research in public health directed by a faculty member. Directed toward the dissertation for the Doctor of Philosophy degree. Prerequisite: Consent of the instructor.

Italian (Ital)

402. Italian Syntax. 4 Hours. Structure of the grammatical system of Italian. Analysis of the most important syntactic phenomena with emphasis on the meanings and functions of verb forms. Prerequisite: Ital 305 or consent of the instructor.

410. Italian Medieval Literature. 4 Hours. Representative literary movements and figures from the origins through the fourteenth century. Emphasis on Dolce Stil Novo, Dante's minor works, Petrarch, and Boccaccio. Prerequisite: Ital 310.

411. Literary Forms in Early Renaissance. 4 Hours. The development of epic poetry (Pulci, Boiardo, Ariosto) within the literary, political, and social context (Machiavelli and Castiglione). Prerequisite: Ital 310 or consent of the instructor.

412. Literary Forms in Late Renaissance and Baroque. 4 Hours. Representative literary works of the genres of the late sixteenth and seventeenth centuries: epic poem of Tasso and poetry of Marino. The birth of the Commedia dell'Arte form. Prerequisite: Ital 310 or consent of the instructor.