COMPUTER INFORMATION SYSTEMS (CIS)

Subject-area course lists indicate courses currently active for offering at the University of Louisville. Not all courses are scheduled in any given academic term. For class offerings in a specific semester, refer to the Schedule of Classes (https://csprd.louisville.edu/psp/ps_class/ EMPLOYEE/PSFT_CS/c/COMMUNITY_ACCESS.CLASS_SEARCH./x/? state=62dab551a0d600a5e8237359c50704e59007&duo_code=sjUx2OSTj21aWVEquQ8ZlYRjHmfxpqoV).

500-level courses generally are included in both the undergraduate- and graduate-level course listings; however, specific course/section offerings may vary between semesters. Students are responsible for ensuring that they enroll in courses that are applicable to their particular academic programs.

Course Fees

Some courses may carry fees beyond the standard tuition costs to cover additional support or materials. Program-, subject- and course-specific fee information can be found on the Office of the Bursar website (https://louisville.edu/bursar/tuitionfee/university-fees/).

CIS 150. Fundamentals of Information Systems   **3 Units**
Term Typically Offered: Fall, Spring
Fee: An additional $30.00 is charged for this course.
Description: This course provides an overview of contemporary information systems, and how they are used in organizations. It presents an introduction to the discipline of CIS and how information systems can be used to create competitive advantage. Topics include application/web development, including the system development life cycle, information security, business process management, and emerging technologies. Students will develop basic web sites including the use of HTML, CSS, and Javascript.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/ setupSearchClassSchedule.cfm)

CIS 199. Software Development I   **3 Units**
Term Typically Offered: Fall, Spring
Fee: An additional $30.00 is charged for this course.
Description: Prerequisites or corequisites: CIS 150. This course introduces object-oriented concepts such as the use of classes, methods, encapsulation, and inheritance. The course concentrates on using object-oriented programming to solve simple problems involving input and output. Computer lab sessions are used to reinforce programming concepts. Extensive programming assignments are required.
Note: Restricted to College of Business majors.

For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/ setupSearchClassSchedule.cfm)

CIS 200. Software Development II   **3 Units**
Term Typically Offered: Fall, Spring
Prerequisite(s): CIS 199.
Fee: An additional $30.00 is charged for this course.
Description: This course emphasizes object-oriented software development. Students study the object model and apply it to systems development problems. Topics include polymorphism, inheritance, and object interaction. Event-driven programming of graphical user interfaces is introduced. Application areas may include data structures, searching, sorting, and databases. Extensive programming assignments are required.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/ setupSearchClassSchedule.cfm)

CIS 205. Information Systems in Organizations   **3 Units**
Term Typically Offered: Fall, Spring, Summer
Fee: An additional $30.00 is charged for this course.
Description: This course helps students develop a working understanding of the differences between information systems and information technology, and how to apply those concepts to facilitate business processes successfully. Broad information systems literacy is a goal since all business majors must take this course. This course does not include computer lab sessions.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/ setupSearchClassSchedule.cfm)

CIS 290. Emerging Topics in Information Systems   **1-3 Units**
Term Typically Offered: Occasionally Offered
Fee: An additional $30.00 is charged for this course.
Description: A variety of emerging topics relevant to contemporary information systems will be studied. Course content may vary each semester but will not duplicate other course offerings.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/ setupSearchClassSchedule.cfm)

CIS 305. Data Analysis for Decision-Making   **3 Units**
Term Typically Offered: Fall, Spring, Summer
Fee: An additional $30.00 is charged for this course.
Description: This project-based course provides students with an opportunity to explore data analysis using spreadsheet and database techniques, including incorporating contemporary decision-making tools in modern spreadsheet software. This course emphasizes the roles of business analysis and knowledge workers through projects and discussions and teaches students how creative use of strong analytical skills can lead to career advancement in any business domain.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/ setupSearchClassSchedule.cfm)

CIS 310. Database Design **3 Units**
Term Typically Offered: Fall, Spring
Prerequisite(s): CIS 199 or CIS 443.
Fee: An additional $30.00 is charged for this course.
Description: This course will provide a solid and practical foundation for the design and implementation of database systems. Emphasis will be on relational database models, with significant coverage of basic relational database concepts, normalization, E-R modeling, locking, SQL, and distributed databases. Additional topics include web database, database security, access control policies and procedures, risk management, and ethical aspects of information handling. Course software includes current database tools such as SQL server.
Note: Course is restricted to approved COB BSBA majors and COB Data Analytics minors.

For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

CIS 320. Systems Analysis and Design **3 Units**
Term Typically Offered: Fall, Spring
Prerequisite(s): CIS 199, CIS 305 (or equivalent).
Fee: An additional $30.00 is charged for this course.
Description: Prerequisites or corequisites: CIS 310. Introduces the fundamentals of object-oriented analysis and design, including experience with a CASE tool. Topics include requirements determination, feasibility analysis, modeling with Unified Modeling Language (UML) and data dictionary construction, data modeling and normalization, user interface requirements specification, and information security procedures. Development of problem and design specifications for an information systems project is required. Develops team skills, written and oral communication skills.
Course Attribute(s): CBL - This course includes Community-Based Learning (CBL). Students will engage in a community experience or project with an external partner in order to enhance understanding and application of academic content.

For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

CIS 343. Analytics Programming **3 Units**
Term Typically Offered: Fall, Spring
Prerequisite(s): One of the following: BSTA 301, BSTA 201, CSE 110, IE 360, MATH 109, PSYC 301, SOC 301, PHST 302, POLS 390 or equivalent.
Fee: An additional $30.00 is charged for this course.
Description: Open to all UofL students. This course introduces general programming concepts and techniques to a data analytics audience with no prior programming experience. Students will learn programming techniques that support business analytics with hands-on programming including accessing data, creating informative data graphics, writing functions, debugging, and organizing code. Examples are drawn from the problems and programming patterns often encountered in data analysis. It will use a popular analytics programming language such as Python.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

CIS 344. Data Analytics **3 Units**
Term Typically Offered: Fall, Spring
Prerequisite(s): One of the following: BSTA 301, BSTA 201, CSE 110, IE 360, MATH 109, PSYC 301, SOC 301, PHST 302, POLS 390 or equivalent; open to all UofL students.
Fee: An additional $30.00 is charged for this course.
Description: This course reviews and builds on the fundamental statistical concepts and techniques covered in the undergraduate Business Statistics course. Students will learn to model data and use analytical skills to solve real business problems. Topics include exploratory data analysis, estimation, statistical inference about populations, hypothesis testing, ANOVA, linear and multiple regression, and logistic regression.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

CIS 350. Infrastructure Technologies **3 Units**
Term Typically Offered: Fall, Spring
Prerequisite(s): CIS 199.
Fee: An additional $30.00 is charged for this course.
Description: This course provides an introduction to IT infrastructure issues and covers topics related to computer and systems architecture and communication networks, with an overall focus on the services and capabilities that IT infrastructure solutions enable in an organizational context. It gives students the knowledge and skills that they need for communicating effectively with professionals whose special focus is on hardware and systems software technology and for designing processes and solutions that require in-depth understanding of the IT infrastructure capabilities and limitations. It also prepares students for interaction with external vendors of IT infrastructure components and solutions.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

CIS 396. Zero-Credit Internship-Computer Information Systems **0 Units**
Grading Basis: Pass/Fail
Term Typically Offered: Occasionally Offered
Prerequisite(s): BUS 201; CIS 199 and CIS 305; good academic standing and validation from the Ulmer Career Center; must be a CIS major.
Fee: An additional $45.00 is charged for this course.
Description: A new workplace experience in an approved Computer Information Systems position which offers a progression of learning in a level appropriate opportunity for practical application of classroom theory and tools. This program is available to students who have received the maximum number of co-op credit hours for their major.Application to the zero-credit internship program and completion of orientation processes should be accomplished prior to employment.
Note: This course is restricted and requires permission from the Ulmer Career Management Center.
Course Attribute(s): CBL - This course includes Community-Based Learning (CBL). Students will engage in a community experience or project with an external partner in order to enhance understanding and application of academic content.

For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

CIS 397. Co-op in Computer Information Systems I   **3 Units**
Grading Basis: Pass/Fail
Term Typically Offered: Fall, Spring, Summer
Prerequisite(s): BUS 201; CIS 199 and CIS 305; good academic standing and validation from the Ulmer Career Center; must be a CIS major.
Description: A new workplace experience in an approved CIS position that offers the student an opportunity for practical application of classroom theory and tools.Can be taken with CIS 398 for a total of six (6) hours of co-op credit, students may register for CIS 397 and CIS 398 in one or two semesters. CIS majors only.
Note: Application to the co-op program and completion of the orientation process should be completed prior to employment.
Course Attribute(s): CBL - This course includes Community-Based Learning (CBL). Students will engage in a community experience or project with an external partner in order to enhance understanding and application of academic content.

For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

CIS 398. Co-op in Computer Information Systems II   **1-3 Units**
Grading Basis: Pass/Fail
Term Typically Offered: Fall, Spring, Summer
Prerequisite(s): CIS 397 (or concurrent); university GPA of 2.50; validation through the College of Business Co-op Office.
Description: A new or continued workplace experience in an approved CIS position which offers new learning and/or additional responsibilities that continue the student's progression of learning and opportunity for practical application of classroom concepts and tools.
Note: Usually taken concurrently with CIS 397 for a total of six hours of co-op credit for a six month, full-time work place experience; students may register for CIS 397 and CIS 398 in one or two semesters.
Course Attribute(s): CBL - This course includes Community-Based Learning (CBL). Students will engage in a community experience or project with an external partner in order to enhance understanding and application of academic content.

For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

CIS 399. Co-op in Computer Information Systems III   **3 Units**
Grading Basis: Pass/Fail
Term Typically Offered: Fall, Spring, Summer
Prerequisite(s): BUS 201; CIS 199 and CIS 305; good academic standing and validation from the Ulmer Career Center; must be a CIS major.
Description: A new or continued workplace experience in an approved CIS position which offers new learning and/or additional responsibilities that continue the student's progression of learning and opportunity for practical application of classroom theory and tools.
Course Attribute(s): CBL - This course includes Community-Based Learning (CBL). Students will engage in a community experience or project with an external partner in order to enhance understanding and application of academic content.

For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

CIS 411. Web Application Development   **3 Units**
Term Typically Offered: Fall, Spring
Prerequisite(s): CIS 200, CIS 310, and CIS 350.
Fee: An additional $30.00 is charged for this course.
Description: This course introduces dynamic web applications and how they are developed. Students will understand the role of client-side and server-side technologies, and use web forms, various server controls and session objects to develop multipage web applications. Students will gain system development experience with current web development tools and platforms.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

CIS 420. CIS Development Project   **3 Units**
Term Typically Offered: Fall, Spring
Prerequisite(s): CIS 310, CIS 320 and CIS 350.
Fee: An additional $30.00 is charged for this course.
Description: A continuation of CIS 320, this course focuses on the detailed design and implementation phases of the system development life cycle, including user acceptance testing, test planning, design reviews, and change procedures. Specifications created in CIS 320 are used to implement, test, and install a working version of an information system. System deployment emphasizes a web-based architecture. A prototyping approach is taken to develop and test the system in an iterative manner. Students are grouped into project teams, and each team member accepts task assignments necessary to deliver the information system prototype.
Course Attribute(s): CBL - This course includes Community-Based Learning (CBL). Students will engage in a community experience or project with an external partner in order to enhance understanding and application of academic content.

For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

CIS 430. User Interface Design   **3 Units**
Prerequisite(s): CIS 320.
Description: This course provides a conceptual basis and practical guidelines for the design and development of graphical user interfaces. The course introduces Human-Computer interaction and human factor concepts.Design emphasis is placed on effective information presentation and usability concerns. Development of prototype user interfaces using contemporary GUI software, such as Visual Basic or Web development tools is required.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

CIS 445. Machine Learning 3 Units
Term Typically Offered: Spring Only
Prerequisite(s): CIS 310 or CSE 335; CIS 443 and CIS 444; Open to all UofL students.
Fee: An additional $30.00 is charged for this course.
Description: This course introduces basic machine learning concepts, techniques and its application to business problems. Topics include data preparation, feature selection, predictive modeling, classification, clustering, evaluation, validation, supervised & unsupervised, reinforcement, deep learning and scalability. The emphasis will be on the application of machine learning techniques to problems in a business context. While there will be discussion about use of machine learning tool and common techniques, the math behind those techniques is not the focus of this course. Machine learning techniques about both structured and unstructured data (such as natural text) are discussed. Heavy use of a machine learning software (e.g., SAS, SPSS) is expected.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

CIS 446. Business Analytics 3 Units
Prerequisite(s): CIS 444.
Fee: An additional $30.00 is charged for this course.
Description: This course provides a hands-on learning experience using advanced statistical tools (e.g., SAS and SPSS) that can be leveraged to work with structured data and generate business knowledge. This course covers sophisticated techniques, such as predictive modeling, time-series analysis, and growth modeling. After taking this course, students are expected to be able to: (1) solve common analytical business problems; (2) think systematically about if and how data can help make better-informed decisions; (3) and use business analytical tools.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

CIS 447. Advanced Business Analytics 3 Units
Prerequisite(s): CIS 445 and CIS 446.
Fee: An additional $30.00 is charged for this course.
Description: This course teaches students how to use state of the art analytical tools (e.g.; Hadoop, SAS Enterprise Miner) to handle data that comes in a variety of forms and sizes in more complex, less structured business situations. Students will participate in extensive hands-on work solving realistic business problems. This course guides students with handling optimization models, Monte Carlo simulations, and decision analysis.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

CIS 450. Special Topics in Data Analytics 3 Units
Term Typically Offered: Fall Only
Prerequisite(s): CIS 310 or CSE 335; CIS 443 and CIS 444; Open to all UofL students.
Description: Explore current topics of interest in data science such as data visualization, blockchain, and cloud computing.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

CIS 455. Computer Ethics, Social Issues and the Law 3 Units
Prerequisite(s): CIS 150 and CIS 300.
Description: Provides an introductory examination of the ethical, social, and legal aspects of computing. Topics include responsibilities for computer professionals, intellectual property, privacy, social interaction in electronic forums, policy and other current issues. Case studies, in-class discussion, and position papers are used extensively.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

CIS 480. Introduction to Network Security 3 Units
Term Typically Offered: Fall, Spring
Prerequisite(s): CIS 350 or CSE 420; CIS 481.
Fee: An additional $30.00 is charged for this course.
Description: Basic concepts of networking, operations security, protocol features for security, transmission security, packet filtering, TCP wrappers, firewalls, computer viruses, physical protection, legal protection, liability issues, significance of National Security Directive 42, implications of Computer Security Act, CERT recommendations, assessment of threats and vulnerabilities of systems, security countermeasures, contingency planning, disaster recovery, risk management, and auditing and monitoring, policies and procedures dealing with storage and disposition of sensitive data.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

CIS 481. Introduction to Information Security 3 Units
Term Typically Offered: Fall, Spring
Prerequisite(s): CIS 350 or CSE 420.
Fee: An additional $30.00 is charged for this course.
Description: Basic notions of confidentiality, integrity, availability, authentication models, protection models, security kernels, audit, intrusion detection, operational security issues, physical security issues, security system life cycle management, personnel security, policy formation and enforcement, trust modeling, risks and vulnerabilities assessment, basic issues of law and privacy, trade secrets, employee covenants, copyright, database protection, software and hardware validation, verification and certification.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

CIS 482. Introduction to Cryptography 3 Units
Term Typically Offered: Occasionally Offered
Prerequisite(s): CIS 300; MATH 180 or MATH 205 or EAC 101.
Fee: An additional $30.00 is charged for this course.
Description: Basic concepts of cryptology, historical ciphers, modern symmetric ciphers such as DES, public key cryptography (RSA, elliptic curve cryptosystems), efficient hardware and software implementations of cryptographic primitives, copyright protection (including the Digital Millennium Copyright Act), requirements for implementation of cryptographic modules, data integrity and authentication, digital signature schemes, key exchange and key management, standard protocols for secure mail, electronic payments, security aspects of mobile communications, key escrow schemes, Smart cards, and social implications of new technologies.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

CIS 483. Introduction to Database Security   **3 Units**
Term Typically Offered: Fall, Spring
Prerequisite(s): CIS 310 or CSE 335; CIS 481.
Fee: An additional $30.00 is charged for this course.
Description: Basic data protection methods such as discretionary and mandatory access controls, secure database design, data integrity, secure architectures, secure transaction processing, information flow controls, and auditing, copyright and database protection, privacy issues (including employee records and HIPAA). Security models for relational and object-oriented databases, security of databases in a distributed environment, survey of commercial systems, and research prototypes.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

CIS 484. Computer Forensics   **3 Units**
Term Typically Offered: Fall, Spring
Prerequisite(s): CIS 350 or CSE 420; CIS 481.
Fee: An additional $30.00 is charged for this course.
Description: Basic computer forensics concepts involving evidence collection, preservation, and presentation in court. Technology tools to analyze files, implications on privacy, ethics, policies, risk management and legal aspects will be covered.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

CIS 490. Special Topics in Computer Information Systems   **0.5-9 Units**
Term Typically Offered: Fall Only
Prerequisite(s): One of the following: BSTA 301, BSTA 201, CSE 110, IE 360, MATH 109, PSYC 301, SOC 301, PHST 302, POLS 390 or equivalent.
Fee: An additional $90.00 is charged for this course.
Description: Explores contemporary topics of current interest in information systems, such as emerging telecommunications technologies, decision support, end-user computing, and distributed database management.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

CIS 495. Management of Information Systems - CUE   **3 Units**
Term Typically Offered: Fall, Spring
Prerequisite(s): CIS 310, CIS 320, and CIS 350; Senior standing.
Fee: An additional $30.00 is charged for this course.
Description: Explores strategic development of information technology; value chain analysis and its application to information resource management; information systems planning; organizing, staffing, and controlling the deployment of information technology; the development of an IT platform and architecture consistent with organizational structure.
Note: Course should normally be taken in final semester.
Course Attribute(s): CUE - This course fulfills the Culminating Undergraduate Experience (CUE) requirement for certain degree programs. CUE courses are advanced-level courses intended for majors with at least 90 earned credits/senior-level status., CBL - This course includes Community-Based Learning (CBL). Students will engage in a community experience or project with an external partner in order to enhance understanding and application of academic content.

For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

CIS 499. Independent Study Computer Information Systems   **3 Units**
Term Typically Offered: Fall, Spring, Summer
Prerequisite(s): CIS 310, CIS 320, and CIS 350.
Fee: An additional $30.00 is charged for this course.
Description: Written proposal must be sponsored by at least one faculty member and approved by the Department Chair.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)