Bachelor of Science in Computer Information Systems

May 20, 2013
The following program information for the Bachelor of Science in Computer Information Systems degree program is added to the Parker University Catalog 2012-2013. **Contingent upon final approval from SACS (Southern Association of Colleges and Schools)

6. Bachelor of Science in Computer Information Systems

The mission of the Bachelor of Science in Computer Information Systems is to produce graduates with the technical and organizational skills that participate in the design, construction and maintenance of information systems on effective technological platforms to facilitate the effective storage, transfer, manipulation and use of data and are aligned with the needs of businesses, local and global communities.

6.1. Program Information

The Bachelor of Science in Computer Information Systems (BS CIS) program prepares individuals to effectively participate in the information management and use functions in the contemporary digital enterprise, local and global communities. The program provides knowledge and skills across the entire range of topics in the industry – data storage and transfer, decision-making support, ethics and law, computer networking, database technologies, information technology governance and strategy, web and mobile development, and information assurance.

The core of the program is focused on building a foundation of critical thinking skills on which to make professional judgments and design and implement solutions aligned with the needs of an organization. The BS CIS program builds these thinking skills through a solid understanding of theoretical concepts, methods, principles, and tools and with examination of fundamental information systems and technology issues and processes.

Competent qualified faculty with both academic and industry backgrounds also provide practical perspective from the field. Real-world problems and opportunities with software intensive systems are explored, and methods to evaluate, adopt and take advantage of emerging technologies are learned. BS CIS students will also be working closely with fellow information systems and technology professionals, completing applicable class assignments within teams. Working relationships developed will be a significant resource throughout one's career.
6.2. Learning Outcomes

The program enables students to attain, by the time of graduation:

1. Be able to apply knowledge of computing and mathematics appropriate to the discipline
2. Be able to analyze a problem, and identify and define the computing requirements appropriate to its solution
3. Be able to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs
4. Be able to function effectively on teams to accomplish a common goal
5. Be able to demonstrate an understanding of professional, ethical, legal, security and social issues and responsibilities
6. Be able to communicate effectively with a range of audiences
7. Be able to analyze the local and global impact of computing on individuals, organizations, and society
8. Be able to use current techniques, skills, and tools necessary for computing practice.

In particular, the program objectives fall in three general categories: Technical, organizational and cross-cutting knowledge, skills and dispositions. Upon completion of the program, the graduates will be able to:

I. Technical Domain
   - Apply emerging information technologies to build robust products and solutions to enable services based on service-oriented architecture
   - Implement latest domain processes where business application design is pre-eminent

II. Organizational Domain
   - Manage the in-house and outsources development of information systems projects.
   - Contribute to business processes through a process of analysis, design and optimization in response to organizational needs.

III. Crosscutting Domain
   - Analyze social and other external impacts along with relevant legal, regulatory, ethical and professional issues in business and technical decision-making.
   - Communicate effectively with technical, business and user/customer audiences.
6.3. Admissions
Minimum requirements for admission to the BS in Computer Information Systems

- Applicants must be at least 18 years of age at the time of admission
- Applicants must provide proof of high school graduation or GED or an official transcript with at least 60 hours of undergraduate level study
- Complete an online or print application

*Note: Applicants who do not hold legal residency status in the US are eligible for entry but will be subject to citizenship status of state licensing boards and employers in the US.

Parker University's graduation requirements for the Bachelor of Science with a major in Computer Information Systems are as follows.

1. A grade of C or above must be earned in each professional program course completed in residence or transferred to Parker.
2. Academic requirements for graduation with a major in business computer information systems for the BS degree: A minimum 2.7 grade point average in all hours attempted in the professional program course, with minimum grades of C required in each professional program course;
3. A minimum 2.7 grade point average in all courses completed at Parker; and
4. A grade of C or above in each BCIS course taken in the professional program.

The University has a standardized grading, transcripts, and transfer of credits policies. The Bachelor of Science with a major in Computer Information Systems will follow the University's standardized policies. These policies are published in the university catalog addendum [Appendix VI].

6.4. Application Procedures
Procedures for applying for admission to Parker University’s BS in Computer Information Systems program:

1. Submit to the Admissions Office a properly completed application for either the January, May or September trimester. Applications may be picked up in the Admissions Office or located on the Parker website at: https://my.parker.edu/ICS/Future_Students/Apply_to_Parker/
2. Request official transcripts to be sent from high school and all higher education institutions where credits were earned and mailed from that institution directly to the Registrar’s Office at Parker University.

Students also have the option to fill out a transcript authorization/release form available from the Admissions/Registrar’s office to allow Parker to request transcripts on a student’s behalf. Transcript fees will be added to a student’s first trimester of enrollment costs.

Students who completed the GED for high school credit fill out the transcript authorization/release form and the Registrar’s office will verify credit.

3. If the student is a veteran of the U.S. armed forces, provide the University with a copy of their DD 214 and a letter of eligibility from the VA.

Transcripts that accompany the student’s application form will be considered official if sealed by the institution, unopened by the student and not stamped issued to student on transcript.

(A) Deadlines for Applications

Applications for admissions must be received by the deadlines for the desired trimester.

<table>
<thead>
<tr>
<th>January Trimester</th>
<th>January 1 prior to start</th>
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<tbody>
<tr>
<td>May Trimester</td>
<td>May 1 prior to start</td>
</tr>
<tr>
<td>September Trimester</td>
<td>September 1 prior to start</td>
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</tbody>
</table>

All admissions documents and reservation deposits must be received prior to registration, with the exception of the final official transcript from the school that the student is currently attending. All final transcripts must be received within a student’s first trimester. Incoming students will not receive financial aid disbursements until their admissions file is complete and they are fully matriculated.

(B) Rules for Processing Applications through Final Enrollment

To accurately and promptly process each application, Parker University has established certain limitations on enrollment and other rules that each applicant must follow to hold his or her place in a class. If any of these time limits or deadlines pass, the place originally reserved becomes available to other applicants.
(C) Acceptance and Reservation

Deposit
After the Admissions Office processes the required materials, candidates are notified in writing regarding decisions of the Registrar’s Office. An applicant who is accepted must remit a non-refundable, non-transferrable reservation deposit of $50. This fee is applied toward the first trimester’s tuition.

6.5. Transfer of Credit
Parker will transfer course work that is equivalent in credit hours, content, duration, and course objectives to that of Parker University courses.

The policy for determining equivalency or transfer credit between educational institutions in Texas has been set by the Texas Higher Education Coordinating Board (THECB). By the use of a Texas Common Course Numbering System (TCCNS), a uniform set of course designations, for lower-division academic courses, have been cooperatively agreed upon by institutions of higher education in Texas. The use of the TCCNS aids in the determination of course equivalency, degree applicability during the evaluation process, and promotes consistency in the evaluation process.

(A) Transfer of Credit Policies and Procedures
For students enrolling at Parker University, credit for courses or degrees completed at another institution is subject to approval by the Registrar. Each course will be evaluated by the Registrar’s office and subsequently matched to specific courses outlined in the student’s desired program. If the naming conventions of the courses completed at the prior institutions do not match the course at Parker University, further investigation is conducted. In this case, course descriptions are retrieved from the prior institution’s academic catalog. Based on the description of the course content, the course where credit was earned will be accepted as transferrable credit if it meets the course content at Parker University. Parker recognizes transfer credit from institutions that have approved articulation agreements with the University.

The Registrar makes a temporary evaluation from unofficial transcripts. However, only courses listed on official transcripts receive permanent official transfer credit. Official transcripts must be received directly from the former institution within a student’s first semester or no transfer credits are officially granted.

It is the students’ responsibility to request that official transcripts be sent from all prior institutions where credits were earned and mailed from that institution directly to the Registrar’s Office at Parker University. Students also have the option to fill out a transcript authorization/release form available from the Admissions/Registrar’s office to allow Parker to request transcripts on a student’s
Transcript fees will be added to a student’s first trimester of enrollment costs. *A transcript stamped “Issued to Student” or hand-carried into the Registrar’s Office is not considered to be an official transcript.*

Students are informed in writing of any credits accepted as transferable. Preliminary notification is presented, in most cases, prior to enrollment but in no case later than the end of a transfer student's first semester.

Parker University makes no guarantees or promises of acceptance of credits from any other institution. Credit value accepted by Parker University follows program requirements even though more time may have been devoted and more credit awarded in covering the material at the institution from which a student is transferring the credits from. It may be necessary for students to forfeit previously earned credit in the transfer process since college philosophies, objectives and programs may vary and change from year to year. Decisions are made so that a student's academic program provides the most professional training.

(B) **Transfer of Credit Guidelines**

The following guidelines are used in evaluating transcripts for transfer credit received from other accredited institutions:

1. **Transfer from Regionally Accredited Institutions**

   Parker University accepts transfer credits applicable to an applicant’s program of study from regionally accredited institutions. Transfer credit is granted only for courses in which a letter grade of “C” or higher was earned (2.0 on a 4.0 scale). Parker University accepts transfer of associate degrees that, upon evaluation, include the appropriate major course distribution without time limitations. Prior to granting transfer of credit for any course, the University reserves the right to test applicants or request that they successfully pass an examination administered by a Parker University faculty member.

2. **Transfer from Non-Regionally Accredited Institutions**

   Credit for courses from non-regionally accredited institutions which are substantially equivalent in content to Parker University courses and are applicable to an applicant’s program of study may be granted on a course-by-course basis. The acceptance of courses from non-regionally accredited institutions is contingent upon appropriate faculty credentials and applicable course content of the course to be transferred. Transfer credits are granted only for courses in which a grade of "C" or higher was earned (2.0 on a 4.0 scale). Prior to granting transfer of credit for any course, the University reserves the right to test applicants or request that they successfully pass an examination administered by a Parker University faculty member.
(3) **Transfer from International Institutions**
Upon receipt of an official transcript, transfer credits from non-U.S. colleges/universities are evaluated and granted on a course equivalency basis. It is the students’ responsibility to contact an approved educational evaluator organization to request that a foreign transcript review be prepared and mailed directly to Parker University, Registrar’s Office attesting that the courses are equivalent to courses earned at a regionally accredited institution of higher education in the United States. Transfer credits are granted only for courses in which a grade of "C" or higher was earned (2.0 on a 4.0 scale). Prior to granting transfer of credit for any course, the University reserves the right to test applicants or request that they successfully pass an examination administered by a Parker University faculty member.

(4) **Veteran Transfer of Credits**
A Veterans Administration benefit recipient has the responsibility to report all previous education and training to Parker University. The University evaluates the information and grants appropriate credit, with training time and tuition reduced proportionally. The veteran student and the Veterans Administration are notified.

(5) **Acceptance of Alternative Credit**
No more than 20 semester hours of credit may have been earned through the College Level Examination Program (CLEP) or other institutional proficiency exams, such as Defense Action for Non-Traditional Educational Support (DANTES), Advanced Placement Program (APP), Program Evaluation Procedure (PEP), New York Board of Regents College Examinations, through challenging a course, or through experience and training in the military. Students cannot CLEP or test out of lab requirements. Such equivalency will be acceptable only if the applicant has certification of the credits by an institution accredited at the college level by an accrediting organization recognized by the U.S. Department of Education.

(6) **Conversion from Clock Hours to Credit Hours**
The program follows the semester-hour system. To convert clock hours to semester credit hours for transfer credit the following formulas are used:
- 15 lecture clock hours = 1 semester credit hour
- 30 laboratory clock hours = 1 semester credit hour
- 45 externship clock hours = 1 semester credit hour

(7) **Conversion from Quarter Hours to Credit Hours**
The program follows the semester-hour system. To convert quarter hours to semester hours, multiply the quarter-hours by a factor of 0.67. To convert semester hours to quarter-hours divide by 0.67.
6.6. Transfer of Parker Credit to Other Institutions
Students who are interested in continuing their education at an institution other than Parker University should first make inquiry at the institution they plan to attend to determine credits and requirements needed for entrance to that institution. Transferability of credits is at the discretion of a receiving institution. Parker University cannot assure transfer of credit; however, Parker University has entered into articulation agreements with some local colleges and universities. Students should contact the Registrar for specific information.

6.7. Length of Program
The degree will be offered through a web-based distance learning instructional format and may be completed in 10 semesters. The curriculum will include: four semesters of general education core coursework and program prerequisite coursework, and six semesters of Computer Information Systems major coursework reinforced with professional practice experience assignments.

6.8. Graduation Requirements
Parker University's graduation requirements for the Bachelor of Science with a major in Computer Information Systems are as follows.

1. A grade of C or above must be earned in each professional program course completed in residence or transferred to Parker.
2. Academic requirements for graduation with a major in business computer information systems for the BS degree: A minimum 2.5 grade point average in all hours attempted in the professional program course, with minimum grades of C required in each professional program course;
3. A minimum 2.5 grade point average in all courses completed at Parker; and
4. A grade of C or above in each BCIS course taken in the professional program.

6.9. Residency Requirements
To earn the Bachelor of Science degree students must complete a minimum of the final 25% of the total credits required while in resident study at Parker University.

6.10. Mode of Instruction
The Bachelor Science in Computer Information Systems degree will be offered through a web-based distance education instructional format.

6.11. Tuition and Fees (as of January 1, 2013)
All charges, including tuition and fees, are due and payable on or before the first day of class.

| Tuition per credit hour | $660 |
Late Registration fee (per day) $50

6.12. Degree Requirements
The Bachelor of Science in Computer Information Systems requires a minimum of 120 semester credit hours of lower and upper division coursework
- 48 General Education credit hours
- 72 Computer Information Systems major core and application courses

6.13. Curriculum
Bachelor of Science in Computer Information Systems

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Semesters 1-3</th>
<th>Course Number</th>
<th>Course</th>
<th>Cr Hours</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>PSYC 2301</td>
<td>Introduction to Psychology</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>COSC 1301</td>
<td>Intro to Computer</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ENGL 1301</td>
<td>English Composition</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SPCH 1311</td>
<td>Speech Communications</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ACCT 2301</td>
<td>Principles of Accounting I</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BIOL 2301</td>
<td>Anatomy and Physiology I</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BIOL 2302</td>
<td>Anatomy and Physiology II</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MATH 1314</td>
<td>College Algebra</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ACCT 2302</td>
<td>Principles of Accounting II</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ARTS 1301</td>
<td>Music Appreciation</td>
<td>3</td>
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<tr>
<td></td>
<td></td>
<td>HIST 1301</td>
<td>American History I</td>
<td>3</td>
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<tr>
<td></td>
<td></td>
<td>HIST 1302</td>
<td>American History II</td>
<td>3</td>
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<td></td>
<td><strong>Total Credit Hours Year 1</strong></td>
<td><strong>36</strong></td>
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### Year 2
#### Semesters 4-6

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course</th>
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<tbody>
<tr>
<td>MATH 1316</td>
<td>Statistics</td>
<td>3</td>
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<tr>
<td>GOVT 2301</td>
<td>Political Science I</td>
<td>3</td>
</tr>
<tr>
<td>GOVT 2306</td>
<td>Political Science II</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 2326</td>
<td>American Literature</td>
<td>3</td>
</tr>
<tr>
<td>COMP 1301</td>
<td>Fundamentals of ITS</td>
<td>3</td>
</tr>
<tr>
<td>COMP 1302</td>
<td>Programming Logic</td>
<td>3</td>
</tr>
<tr>
<td>COMP 2301</td>
<td>Computer Architecture</td>
<td>3</td>
</tr>
<tr>
<td>COMP 2305</td>
<td>Discrete Mathematical Methods</td>
<td>3</td>
</tr>
<tr>
<td>COMP 2302</td>
<td>Computer Programming I</td>
<td>3</td>
</tr>
<tr>
<td>COMP 2306</td>
<td>Networking Essentials</td>
<td>3</td>
</tr>
<tr>
<td>COMP 2307</td>
<td>Operating Systems</td>
<td>3</td>
</tr>
<tr>
<td>COMP 3301</td>
<td>Data and Information Management</td>
<td>3</td>
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**Total Credit Hours Year 2**: 36

### Year 3
#### Semesters 7-9

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course</th>
<th>Cr Hours</th>
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</thead>
<tbody>
<tr>
<td>COMP 2303</td>
<td>Computer Programming II</td>
<td>3</td>
</tr>
<tr>
<td>COMP 2304</td>
<td>Ethical, Social &amp; Legal Dimensions of CMP</td>
<td>3</td>
</tr>
<tr>
<td>Course Number</td>
<td>Course</td>
<td>Cr Hours</td>
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</tr>
<tr>
<td>COMP 3313</td>
<td>Data Warehousing and Business Intelligence</td>
<td>3</td>
</tr>
<tr>
<td>COMP 3303</td>
<td>Software Engineering</td>
<td>3</td>
</tr>
<tr>
<td>COMP 3321</td>
<td>Enterprise Architecture</td>
<td>3</td>
</tr>
<tr>
<td>COMP 3302</td>
<td>System Analysis and Design</td>
<td>3</td>
</tr>
<tr>
<td>COMP 3311</td>
<td>Project and Service Management</td>
<td>3</td>
</tr>
<tr>
<td>COMP 4302</td>
<td>Web Programming</td>
<td>3</td>
</tr>
<tr>
<td>COMP 4301</td>
<td>IT Security and Risk Management</td>
<td>3</td>
</tr>
<tr>
<td>COMP 3321</td>
<td>Data Structures and Algorithm Analysis</td>
<td>3</td>
</tr>
<tr>
<td>COMP 4311</td>
<td>Cloud Computing and Virtualization Methods</td>
<td>3</td>
</tr>
<tr>
<td>COMP 4304</td>
<td>Application Development</td>
<td>3</td>
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</table>

**Total Credit Hours Year 3** 36

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course</th>
<th>Cr Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP 4361</td>
<td>IT Audit and Controls</td>
<td>3</td>
</tr>
<tr>
<td>COMP 4312</td>
<td>Business Process Management</td>
<td>3</td>
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<tr>
<td>COMP 4362</td>
<td>Capstone Project I</td>
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</tr>
<tr>
<td>COMP 4363</td>
<td>Capstone Project II</td>
<td>3</td>
</tr>
</tbody>
</table>

**Total Credit Hours Year 4** 12

### 6.13. Course Descriptions
PSYC 2301-Introduction to Psychology
Introduces terms and concepts dealing with basic psychological research methods, human and animal behavior, life-span development, states of consciousness, learning, memory, intelligence, motivation, personality structure, stress and coping, behavior disorders, social pressures and cultures. Students are encouraged to apply critical thinking strategies through their participation in various discussions of psychological theories and concepts throughout this course. (Parker University requires a minimum of 4,000 written words for the course.) (3 cr hrs)

COSC 1301-Introduction to Computers
Introduces fundamentals of operating personal computer equipment. Topics include basics of word processing, database management, electronic spreadsheets and presentation graphics. (3 cr hrs)

ENGL 1301-English Composition
Develops writing skills to achieve career goals. Topics include using principles of pre-writing, drafting, revising and editing to write clear, well-developed paragraphs, essays and a documented research paper. (Parker University requires a minimum of 4,000 written words.) (3 cr hrs)

SPCH 1311-Speech Communications
Focuses on preparation and delivery of various types of speeches. Topics include techniques to improve interpersonal communication skills, job interviewing and working in teams. (3 cr hrs)

ACCT 2301-Principles of Accounting I
Defines the objectives of accounting and their relationship to business through fundamental concepts and principles. Topics include theories of debits and credits, classification of accounts, journalizing, preparation of financial statements and use of a trial balance. Accrual method accounting procedures are discussed with end-of-year procedures and financial statements. The practice problems review the complete operation of a small business. (3 cr hrs)

BIOL 2301 Anatomy and Physiology I
Provides basic structure, function and chemistry of the human body. Topics include terminology; chemistry; cell biology; tissues; cellular respiration and body systems including skeletal, muscular, respiratory, reproductive and integumentary. (3 cr hrs)

BIOL 2302 Anatomy and Physiology II
Continues BIOL 2401 (Human Anatomy and Physiology I) with emphasis on circulatory, digestive, endocrine, immune, lymphatic, nervous and urinary systems. Topics include blood, sense organs, nutrition and metabolism, fluid and electrolyte balance and acid-base balance. (3 cr hrs)

**MATH 1314-College Algebra**
Prepares students for disciplines involving quantitative calculations. Topics include operations with algebraic expressions, radicals, exponents, linear and quadratic equations with applications, graphs of linear, quadratic, cubic and rational functions, combinations of functions, composite functions, direct, inverse and joint variation, radical equations, absolute value equations and inequalities, exponential and logarithmic equations and applications, systems of linear equations, and complex numbers. (3 cr hrs)

**ACCT 2302 Principles of Accounting II**
Presents accounting principles and concepts applicable to receivables, fixed assets, payroll, cash flow, financial analysis and accounting for partnerships and corporations. The practice problems review the complete operation of a small corporation. (3 cr hrs)

**ARTS 1301-Music Appreciation**
Introduces basic elements of music combined with a survey of Western art music. (3 cr hrs)

**HIST-1301 American History Pre 1877**
Examines American history from 1492 to 1876, focusing on political, economic and diplomatic events. (3 cr hrs)

**HIST-1302-American History Since 1876**
Examines American history since 1876, focusing on political, economic and diplomatic events. (3 cr hrs)

**MATH 1316-Statistics**
Algebra-based introduction to data analysis, experimental design, sampling, probability, inference, and linear regression. Emphasis on applications, statistical reasoning, and data analysis using statistical software. (3 cr hrs)

**GOVT 2301 Political Science I**
Addresses how America has evolved from an agrarian to a post-industrial society. Topics include the Constitution and its three branches of government. (3 cr hrs)

**GOVT 2306 Political Science II**
Review of governmental and political structures in America as they encounter urban, social and political problems. (3 cr hrs)

**ENGL 2326-American Literature**
Explores select American authors and literary texts. Topics include historical background, social forces, literary genres and elements. (Parker University requires a minimum of 4,000 written words.) (3 cr hrs)

**COMP 1301 Fundamentals of Information Technology and Systems**
This course introduces contemporary information systems and demonstrates how they are used throughout global organizations. The focus of this course is on the key components of information systems - people, software, hardware, data, and communication technologies, and how these components integrate and are managed to create competitive advantage. Students gain an understanding of how information is used in organizations and how information technology enables improvements in quality, speed, and agility. (3 cr hrs)

**COMP 1302 Programming Logic**
This course introduces algorithmic thinking and problem solving without focusing on any particular programming language. Students learn the basic constructs of programming, including variables, constants, expressions, control structures, functions pointers and arrays, and are introduced to functional, decision-based and iterative processing of data. (3 cr hrs)

**COMP 2301 Computer Architecture**
This course is an introduction to the architecture of computer systems. Topics include: computer hardware organization; floating-point arithmetic; central processing units; instructions set design issues; micro-programmed control; addressing and memory hierarchies; bus control and timing; hardwired control; parallelism, pipelining; input/output mechanisms, peripheral devices; interrupt systems; software versus hardware trade-offs. (3 cr hrs)

**COMP 2305 Discrete Mathematical Methods**
This course is introduces discrete mathematical methods and discusses their application across the computing sciences. The course topics include Combinatorial Problems and Techniques, Sets, Relations and Functions, Coding Theory, Graphs, Matching, Counting Techniques, Recurrence Relations and Generating Functions. (3 cr hrs)
COMP 2302 Computer Programming I
This course examines the fundamental data structures and associated algorithms. Data structures that are explored include files, sets, strings, and linked lists. Students compare search and sorting algorithms using algorithm analysis techniques. This course also covers abstract data types and essential data structures such as arrays, stacks, queues, and trees. The emphasis of this course is on program development through various programming projects. (3 cr hrs)

COMP 2306 Networking Essentials
This course includes the fundamentals of network standards, concepts, topologies and terminologies including local and wide area networks, Internet Protocol addressing, subnet masking and network design, and various protocols. Students explore the concepts from the Open Systems Interconnection Networking Reference Model to describe the function and structure of network communications protocols. (3 cr hrs)

COMP 2307 Operating Systems
The course is an introduction to the fundamentals of operating systems. Topics included: concurrent processes and synchronization mechanisms; processor scheduling; memory management, virtual memory; paging, file management; input/output management; deadlock management; interrupt structures, interrupt processing; device management; performance of operating systems; synchronization in a multi-programmed OS and with virtual memory management. Formal principles are illustrated with examples and case studies of one or more contemporary operating systems. (3 cr hrs)

COMP 2308 Data and Information Management
This course introduces the core concepts in data and information management. It is centered around the core skills of identifying organizational information requirements, modeling them using conceptual data modeling techniques, converting the conceptual data models into relational data models and verifying its structural characteristics with normalization techniques, and implementing and utilizing a relational database using an industrial-strength database management system. (3 cr hrs)

COMP 2303 Computer Programming II
This course concentrates on the concepts of object oriented programming paradigm. Concepts presented are exemplified using a selected object oriented programming language. Topics include: fundamental abstraction, modularity and encapsulation mechanisms, classes, inheritance, polymorphism, exception handling, concurrent
programming, data structures. Students complete a project that utilizes object oriented programming. (3 cr hrs)

**COMP 2304 Ethical, Societal and Legal Dimensions of Computing**
This course discusses the ethical, organizational, and social implications, rights and duties related to the actions of computing professionals. It investigates the context in which professionals work, the laws and how they are created, human aspects of running a company, software contracts and liability, intellectual property rights, and the legislation that affects the way in which computers are used or misused. Topics include social, legal, financial, organizational and ethical issues in the context of information technology; the role of professional codes of conduct and ethics; and, key legislation. (3 cr hrs)

**COMP 3313 Data Warehousing and Business Intelligence**
This course is an introduction to Business Intelligence as topic and as tool, and covers current views on and methods for building a data warehouse. These topics are combined with practical examples and methods from the real world. Students explore how to store big data and how to support the organizational decision making processes by processing big data and discovering valuable connections that help an organization gain and maintain competitive advantage. (3 cr hrs)

**COMP 3303 Software Engineering**
This course covers the techniques in software design and development. Topics include: modern software engineering practice for long-term, large-scale programming projects; methods for requirements, specification, design, analysis, implementation, verification, and maintenance of large software systems; advanced software development techniques and large project management approaches; project planning, scheduling, resource management, accounting, configuration control, and technical documentation. Students organize, manage and develop a software engineering project. (3 cr hrs)

**COMP 3321 Enterprise Architecture**
This course explores the design, selection, implementation and management of enterprise information technology solutions. The focus is on the applications and infrastructure and their fit with the business. Students learn frameworks and strategies for infrastructure management, system administration, data/information architecture, content management, distributed computing, middleware, legacy system integration, system consolidation, and software selection, total cost of ownership calculation, information technology investment analysis, and emerging
technologies. These topics are addressed both within and beyond the organization, with emphasis on the management of risk and the security within audit and compliance standards. (3 cr hrs)

**COMP 3302 System Analysis and Design**
This course discusses the processes, methods, techniques and tools that organizations use to determine how they should conduct their business, with a particular focus on how information technologies can most effectively contribute to the way business is organized. The course covers a systematic methodology for analyzing a business problem or opportunity, determining what role, if any, computer-based technologies can play in addressing the business need, articulating business requirements for the technology solution, specifying alternative approaches to acquiring the technology capabilities needed to address the business requirements, and specifying the requirements for the information systems solution in particular, in-house development, development from third-party providers, or purchased commercial-off-the-shelf packages. (3 cr hrs)

**COMP 3311 Project and Service Management**
This course discusses the processes, methods, techniques and tools that organizations use to manage their information systems projects. The course covers a systematic methodology for initiating, planning, executing, controlling, and closing projects. This course assumes that project management in the modern organization is complex team based activity, where various types of technologies (including project management software as well as software to support group collaboration) are an inherent part of the project management process. This course also acknowledges that project management involves both the use of resources from within the firm, as well as contracted from outside the organization. (3 cr hrs)

**COMP 4302 Web Programming**
The student explores the software development life cycle for web applications. It provides an in-depth coverage on critical web application development topics combined with technical foundations and hands-on experiences, and implementation of real-world web applications and secure web transactions. (3 cr hrs)

**COMP 4301 IT Security and Risk Management**
This course provides an introduction to the fundamental principles and topics of information technology security and risk management at the organizational level. Students explore critical security principles that enable them to plan, develop, and perform security tasks. The course addresses hardware, software, processes,
communications, applications, and policies and procedures with respect to organizational information technology security and risk management. (3 cr hrs)

**COMP 3301 Data Structures and Algorithm Analysis**
This course introduces the analysis of algorithms and the effects of data structures on them. Topics include algorithms selected from areas such as sorting, searching, shortest paths, greedy algorithms, backtracking, divide and conquer, and dynamic programming. Data structures include heaps and search, splay, and spanning trees. Analysis techniques include asymptotic worst case, expected time, amortized analysis, solution of recurrence relation and reductions between problems. (3 cr hrs)

**COMP 4311 Cloud Computing and Virtualization Methods**
This course discusses concepts of virtualization of servers/storage with introduction to cloud computing. The described technologies provide the basis for green computing, server consolidation and disaster recovery. Several aspects of virtualization and cloud computing are accompanied by practical applications and examples of utilization in the information technology industry. Design, deployment and management of datacenters including utilization of open-source systems are analyzed and organized into guidance materials. Topics in this course include the concepts and principles of virtualization, the mechanisms and techniques of building virtualized systems, as well as the various virtualization-enabled computing paradigms. (3 cr hrs)

**COMP 44304 Application Development**
The purpose of this course is to introduce the students to the fundamental concepts and models of application development so that they can understand the key processes related to building functioning applications and appreciate the complexity of application development. Program development incorporates the program development life cycle: gathering requirements, designing a solution, implementing a solution in a programming language, and testing a completed application. (3 cr hrs)

**COMP 4361 IT Audit and Controls**
This course introduces the fundamental concepts of the information technology audit and control function. The main focus of this course is on understanding information controls, the types of controls and their impact on the organization, and how to manage and audit them. The concepts and techniques used in information technology audits will be presented. Students will learn the process of creating a control structure with goals and objectives, audit an information technology infrastructure against it, and establish a systematic remediation procedure for any
inadequacies. The challenge of dealing with best practices, standards, and regulatory requirements governing information and controls is addressed. (3 cr hrs)

COMP 4312 Business Process Management
In this course students are introduced to key concepts and approaches to business process management and improvement. The main focus of this course is both understanding and designing business processes. Students learn how to identify, document, model, assess, and improve core business processes. Students are introduced to process design principles. The way in which information technology can be used to manage, transform, and improve business processes is discussed. Students are exposed to challenges and approaches to organizational change, domestic and offshore outsourcing, and inter-organizational processes. (3 cr hrs)

COMP 4362 Capstone Project I
This course is the first phase of a technical project that emphasizes engineering design principles on a specific topic in the information systems and technology domain. The project is carried out by the student under the supervision of a faculty member. The first phase of the project includes identification of a topic and completion of the preliminary work. A progress report must be submitted at the end of the semester detailing the problem description, proposed solution approach, and a list of deliverables. (3 cr hrs)

COMP 4363 Capstone Project II
This course is the second phase of the technical project that emphasizes engineering design principles on a specific topic in any field of computer science or engineering. It will be carried out by the senior student under the supervision of a faculty member. The first phase of the project must be completed in Capstone Project I. A written report summarizing the accomplishments of the project and an oral presentation are required in this course. (3 cr hrs)