Program Outcomes and Assessment

Degree Program: Bachelor of Science - Information Technology (BSIT)

Contact Person: Larry Booth

Program Mission Statement: The IT Program (BIT, BSIT, CSCI) is committed to positively impact society (locally, nationally, and internationally) through academic, applied, and educational research to build, expand, disseminate and teach the information technology body of knowledge.

The Georgia Bachelor of Science in Information Technology (BSIT) degree program (WebBSIT, 2009) is offered collaboratively by five University System of Georgia (USG) institutions: Armstrong Atlantic State University; Clayton State University; Columbus State University; Georgia Southern University; and Southern Polytechnic State University.

The degree requires that students be admitted to one of the five collaborating institutions. The WebBSIT offers the Information Technology core curriculum (Area F) and all upper division courses entirely online. The program assumes that students have completed most of their general education courses (Areas A - E).

The Georgia WebBSIT program has two primary purposes. The first purpose is to produce IT graduates with the knowledge, skills, and abilities to meet the needs of Georgia employers. The second, to provide access to a BSIT education for Georgia citizens who would otherwise be unable to pursue such training within the State (WebBSIT, 2004).

BSIT Learning Outcomes

Outcome 1: Use and apply current IT discipline-related concepts and practices.

Outcome 2: Identify and analyze problems or opportunities in the IT realm and define requirements for addressing them when an IT solution is appropriate.

Outcome 3: Design and develop effective IT-based solutions and integrate them into the user environment.

Outcome 4: Create and implement effective project plans.

Outcome 5: Identify and investigate current and emerging technologies and assess their applicability to address individual and organizational needs.

Outcome 6: Analyze the impact of technology on individuals, organizations, and society.

Outcome 7: Collaborate in teams to accomplish common goals.

Outcome 8: Communicate effectively and efficiently.

Outcome 9: Recognize the qualities necessary to succeed in a professional environment.

Assessment Methods/Type of Evidence

The Operating Board of the WebBSIT used Bloom's taxonomy of the cognitive domain (Bloom 1956) to develop a scheme for mapping program outcomes to courses. Three levels of mastery have been defined based on Bloom: developing level of mastery, mature level of mastery, and proficient level of mastery. Correspondingly, assessment rubrics for each assignment element rely on these three levels of mastery (Booth 2006). See Table 1.

Table 1. Levels of Mastery

Level	Definition
Developing	Demonstrates an emerging level of knowledge and skills; can perform beginning skills and shows potential to perform independently.
Mature	Demonstrates a refined level of comprehension; is able to apply appropriate skills and perform both independently and as a team member

Proficient	Demonstrates a superior level of knowledge and understanding; integrates and applies skills across multiple areas both independently and as a team member.

One or more of the program outcomes is mapped to each course. The mapping indicates whether the outcome will be assessed at the developing level, mature level, or proficient level (see BSIT Matrix). One or more individual course objectives are mapped to each program outcome. The mapping of course objectives to program outcomes is recorded in public syllabi for each course.

The WebBSIT Program is the product of a collaborative development process. The collaboration began in May 2002. The Board of Regents approved the program in 2004 and the first courses were offered that fall. Only a few courses were offered that first year. Therefore, data was collected for a small a subset of BSIT courses initially. The goal for 2009 is to have data collected in all BSIT courses.

Instructors develop and administer assessments, collecting data for each course they teach. A given assessment may address many objectives and an objective may be addressed by many assessments. To effectively map this many-to-many relationship, assessments may be viewed as having one or more elements. Each element is designed to measure one or more course objectives. A given course objective might be assessed by more than one element. Course objectives support specific program outcomes and should be measured against a specific mastery level (Booth, et al. 2009).

Assessment data is collected for each program outcome in each course where that outcome is addressed (see matrix). A variety of assessment tools are used: Quizzes, tests, assignments, presentations, projects, portfolios, and internships. Data is summarized for each course. Because each program outcome is addressed by many courses, data is summarized longitudinally for each program outcome across all relevant courses.

References

Bloom, B. S. (1956). *Taxonomy of Educational Objectives Handbook 1: Cognitive domain*. New York: Longman, Green & Company.

Booth, L. (2006). A database to promote continuous program improvement. *Proceedings of the 7th Conference on Information Technology Education SIGITE '06*. 83-88.

Booth, L., Booth, V., Hartfield, F. (June, 2009). Continuous course improvement, enhancements and modifications: Control and tracking. *Online Journal Distance Learning Administration*.

WebBSIT. (2004). *New program proposal*. Atlanta, GA: Georgia Board of Regents.

WebBSIT. (2009). Home Page. Retrieved February 12, 2009, from http://www.webbsit.org/

Data Collection Overview

Developing Level of Mastery

Mature Level of Mastery

Proficient Level of Mastery

	1) Use and apply current IT discipline-related concepts and practices.	*2) Identify/analyze problems/opportunities and define requirements when an IT solution is appropriate*	*3) Design and develop effective, IT-based solutions and integrate them into the user environment.*	*4) Create and implement effective project plans.*	*5) Identify/investigate current & emerging technologies - assess applicability to address needs.*	*6) Analyze the impact of technology on individuals, organizations, and society.*	*7) Collaborate in teams to accomplish common goals.*	*8) Communicate effectively and efficiently.*	*9) Recognize the qualities necessary to succeed in a professional Environment.*
0: Professional Development									
WBIT 2000 The Enterprise and IT	D	D	D	D	D	M		D	D
WBIT 3010 Technical Communication		D		D		D		P	D
WBIT 4020 Profnl Practice and Ethics	P				D	P			P
WBIT 4030 Senior Project-Portfolio	P	P	P	P			P	P	P
1: Systems									
WBIT 1100 Intro to IT	D	D	D		D	M	M	M	M
WBIT 3110 Systems Analysis	M	M	M	D	D	M	M	M	M
WBIT 3111 Project Management	M		M	P			P	P	M
WBIT 4112 Systems Acquisition	P	P	P	P	P	P		P	P
WBIT 4120 HCI	M	P	M		D	P		D	
2: Database									
WBIT 3200 Database Design	M	M	M		D		M	M	M
3: Programming									
WBIT 2300 Discrete Math for IT	D	D						D	
WBIT 1310 Prog. Problem Solving I	D		D					D	
WBIT 2311 Prog. Problem Solving II	M		M					D	
4: Web and Multimedia									
WBIT 3400 Intro to Multimedia	M	D	D		D	D		M	
WBIT 3410 Web Application Devel.	M		M		M		P	M	M
5: Security									
WBIT 3500 Architecture and O.S.	D	M	D		M	D		D	
WBIT 3510 Data Comm, Networking	P	M	M		M			D	
WBIT 4520 Information Security	P	P	M		M	M		P	M
6: Strategy									
WBIT 3600 Intro to E-Commerce	D	D	D		D	M		D	M
WBIT 4601 CRM	P	P	M		M	M	M	M	P
WBIT 4602 IT Strategy	P	P	P	P	M	M	P	P	P
WBIT 4610 IT Policy and Law	P		M		P	P		P	P

Assessment Plan

One or more of the program outcomes is mapped to each course. The mapping indicates whether the outcome will be assessed at a developing level, mature level, or proficient level (see BSIT Matrix). One or more individual course objectives are mapped to each program outcome. The mapping of course objectives to program outcomes is recorded in a WebCT Vista 8 master syllabus for each course. When a course is scheduled to be taught, the master syllabus is used to create a section syllabus.

Vista 8 provides a *Goals* tool that allows course objectives (goals) to be recorded. The *Goals* tool can record program outcomes (categories). Goals are organized under categories. Within this structure, content files, assessments and assignments can be associated with one or more goals.

Vista 8 provides a *Grading Forms* tool to identify performance criteria for discussion topics and assignments. A grading form is analogous to a rubric.

Every time a course is taught, data will be collected . Assessment data is collected for each program outcome in each course where that outcome is addressed. A variety of assessment tools are used: Quizzes, tests, assignments, presentations, projects, portfolios, and internships. Data is summarized for each course. Because each program outcome is addressed by many courses, data is summarized longitudinally for each program outcome across all relevant courses.

Responsibility

To implement continuous program improvement, analysis of data must lead to planned curriculum revision. The WebBSIT has developed clearly defined roles and business rules to define a change management system for the collaborative (Booth, L., et al. 2009)

Roles (Booth, L., et al. 2009)

The responsibility for the oversight of the curriculum and program outcomes is the role of the Operating Board. The Executive Director's role is that of project manager for course development. The Course Architect has primary responsibility for the continuous improvement of an individual course. Each course has a designated Course Architect. The Instructional Designer

helps to ensure that courses map properly to online pedagogy. The Course Section Instructor role is that of content expert with online teaching expertise. For a summary of curriculum and development roles, see Table 2.

Table 2. Curriculum and Course Development Roles
(Booth, L., et al. 2009)

Role	Responsibilities & Qualifications
Operating Board Member	• Develop Business Rules for Course Enhancement • Develop and Enhance the BSIT Curriculum • Review and Update Program Outcomes • Review Course Outcomes and Topics and map to Program Outcomes • Review Recommendations for new course development • Collaborate with the Executive Director and Course Architects
Executive Director	• Develop Business Rules for Course Enhancement • VISTA System Administrator • Collaborate with the Operating Board and Course Architects • Instructional Quality Control • Implementation of new course content in collaboration with Course Architects • Maintain and enhance WebBSIT course template and modules that are not course specific

Course Architect (formerly Course Developer/Content Expert)	• Collaborate with the Operating Board and Executive Director
	• Subject Matter Expert and WebBSIT teaching experience
	• Continuous Course Improvement
	  ○ Solicit input from all instructors who teach sections of the course
	  ○ Review recommendations of new content modules, proposals for new/alternative assessments, assignments, projects, etc.
	  ○ Reviews and recommends to the Operating Board new textbook or other supplemental

	materials for the course ○ Updates course content for new editions of the textbook or new textbooks selected ○ Maintains the Program → Course → Content → Assessment → Grade Book mapping for the course ○ Maintains the instructor notes in each unit of the course ○ Manage and maintain the course template ○ Review of student unit feedback surveys ○ Review of instructor unit feedback surveys ○ Address Instructor concerns about ▪ Errors in the course content ▪ Ideas for course improvement ▪ Identification of issues that may be confusing for the student or the instructor ▪ Useful lessons learned by instructors relating to teaching this specific course which may merit sharing with all instructors
Instructional Designer	• Consult with Course Architects and Executive Director • Knowledge of online course design • Knowledge in online course pedagogy • Knowledge of tools and use in VISTA
Course Section Instructor	• Subject Matter Expert with Online teaching experience, training in online pedagogy and use of online instructional tools • Course Management and use of materials prepared by others to meet the course learning objectives • Customize Course Section Syllabus, Calendar, Assignment/Assessment schedule, Discussions • Collaborates with the Course Architect to ○ Identify errors in the course content ○ Develop ideas for course improvement ○ Identify issues that may be confusing for the student or the instructor ○ Document lessons learned by instructors

	relating to teaching this specific course which may merit sharing with all instructors • Develop and recommend new content lessons, assignments, assessment, and projects that support the course learning objectives

Business Rules (Booth, L., et al. 2009)

BR#1- Program Template Design: The WebBSIT uses a single program template design for all courses in the curriculum. The program template provides visual and content standards and ease of use for learners and instructors as they move from course to course in the program. Elements in the template are approved by the Operating Board, designed in consultation with instructional design experts and maintained at the program level by the Executive Director.

BR#2 – Program Standard Syllabus: The WebBSIT uses a standard syllabus with pre-defined components and language approved by the Operating Board and maintained by the Executive Director.

BR#3 - Course Template Design: The WebBSIT uses a course template for each course in the curriculum. The course template is managed and maintained by the course architect. The course template provides structure and consistency to the content of the course.

BR#4 - Program Outcomes: The WebBSIT program outcomes are entered in Vista 8 as *Categories* in each course. The entry should include the expected level of mastery for the course. Program outcomes are approved by the Operating Board and maintained in the course template.

BR#5 - Course Learning Objectives: Each course learning objective is entered in Vista 8 as a *Goal* which mapped to the program outcome (*Category*) it is designed to support. Course learning objectives can be modified by the course architect after approval by the Operating Board.

BR#6 - Content Modules: Content modules are mapped to the course learning objectives (*Goals*) they are designed to support. Course content modules must contain 1) unit advance organizer or unit overview page, 2) lessons/lecture notes, 3) faculty/instructor notes, 4) end-of-unit feedback survey for students, and 5) end-of-unit feedback survey for instructors. A

content module may contain, where appropriate, 1) PowerPoint presentations which must be enhanced with either audio lecture or instructor notes, 2) end-of-unit assignment with Vista 8 *Grade Form* 3) assessments which must have grading rubrics and an instructor answer key, 4) discussion topics with Vista 8 *Grade Form* and 5) projects, either individual or group, with grading rubric and instructor notes. All graded assessments, assignments, and projects are mapped to the course learning objectives they support and entered in the grade book. The course architect maintains the content modules of the course.

BR#7 – Assessment Data: The course instructor is required to map assessments to course objectives in the grade book and export the course grade book to a spreadsheet at the end of the semester.

BR#8 – Continuous Program Improvement: The Operating Board is required to review the assessment data collected for each course periodically. The goal of the review is to provide timely revisions and updates to the course, to close the feedback loop. The Operating Board should work with the Executive Director and the course architect to document and implement all changes.

References

Booth, L., Booth, V., Hartfield, F. (June, 2009). Continuous course improvement, enhancements and modifications: Control and tracking. *Online Journal Distance Learning Administration*.

Discussion of Results and Changes

2005 – 2007

The BSIT degree was approved by the Board of Regents in 2004 and the first classes were offered in the fall semester of 2004. No curricular changes were made until 2008.

2008

Several minor changes were implemented to align programming prerequisites with the on-campus BIT degree so that students could more easily use equivalent credits earned. Outcomes in three programming courses were compared and found to be similar enough that equivalency was established.

Key program outcomes 1 and 3 were expected in BIT introductory programming classes, BSIT introductory programming classes, and in CSCI introductory programming classes.

Changes were implemented to align mathematics prerequisites between MATH 2020 Discrete Math and WBIT 2300 Discrete Math for IT so that students could more easily use equivalent credits earned. Students who earn credit for MATH 2020 can use the Math course in place of WBIT 2300.

BSIT discrete math program outcomes 1, 2 compare favorably with Math program outcomes 1 and 2 with regard to critical thinking and problem solving. BSIT discrete math program outcome 9 compares favorably with Math program outcome 5 with regard to communication.

Feedback from students indicated a desire to take two introductory courses in the first semester. Outcomes for WBIT 1100 and WBIT 2000 were examined by the WebBSIT Operating Board. There is considerable overlap in the outcomes. The two courses broadly examine the role of IT in the enterprise: WBIT 1100 from the IT professional viewpoint, WBIT 2000 from the business viewpoint. It was determined that WBIT 1100 did not serve a relevant purpose as a prerequisite to WBIT 2000.

Current Catalog Description

WBIT 2311 - Programming and Problem Solving II (3-0-3)

The emphasis of this course is on advanced programming techniques in Java including GUI's, software reuse through component libraries, recursion, event-driven programming, database processing, file processing, and exception handling. Students are able to create event-driven, graphical programs or text-based programs solving practical problems incorporating databases and external files.

Prerequisite(s): WBIT 1310, WBIT 2300.

Change to Catalog Description

WBIT 2311 - Programming and Problem Solving II (3-0-3)

The emphasis of this course is on advanced programming techniques in Java including GUI's, software reuse through component libraries, recursion, event-driven programming, database processing, file processing, and exception handling. Students are able to create event-driven, graphical programs or text-based programs solving practical problems incorporating databases and external files.

Prerequisite(s):

(WBIT 1310 or ITFN 1303 or CSCI 1301) AND (WBIT 2300 or MATH 2020).

Rationale for change: To allow students with equivalent BIT or CSCI courses to more easily register for WBIT 2311.

Current Catalog Description

WBIT 3200 - Database Design, Development and Deployment (3-0-3)

An advanced course in database design, development and deployment. Course emphasizes database design drawing distinctions between data modeling and process modeling using various modeling techniques including Entity-Relationship Modeling, Object Modeling and Data Flow Diagramming; database development using the relational model, normalization, and SQL; database deployment including control mechanisms, forms, reports, menus and web interfaces. Additional topics include procedures, functions, packages and triggers. Students will design, create and process a database to demonstrate competency in the course content.

Prerequisite(s): WBIT 2311.

Proposed Change to Catalog Description

WBIT 3200 - Database Design, Development and Deployment (3-0-3)

An advanced course in database design, development and deployment. Course emphasizes database design drawing distinctions between data modeling and process modeling using various modeling techniques including Entity-Relationship Modeling, Object Modeling and Data Flow Diagramming; database development using the relational model, normalization, and SQL; database deployment including control mechanisms, forms, reports, menus and web interfaces. Additional topics include procedures, functions, packages and triggers. Students will design, create and process a database to demonstrate competency in the course content.

Prerequisite(s): **WBIT 2311 or ITFN 2313 or ITFN 2314 or CSCI 1302.**

Rationale for change: Banner incorrectly shows WBIT 2300 as an additional prerequisite. To allow students with equivalent BIT or CSCI courses to more easily register for WBIT 3200 and to correct the error in Banner, the prerequisites list should be revised.

WBIT 2000
Current Catalog Description
WBIT 2000 - The Enterprise and Information Technology (3-0-3)

This course will look at the structure and management of an information technology infrastructure. From the management aspect the course will touch on principles and practices of managing both people and technology to support an organization. The course will emphasize how to make an information technology infrastructure effective, efficient, and productive. The management of hardware, software, data, networks and other supporting IT functions will be studied.
Prerequisite(s): WBIT 1100.

Proposed Change to Catalog Description
WBIT 2000 - The Enterprise and Information Technology (3-0-3)

This course will look at the structure and management of an information technology infrastructure. From the management aspect the course will touch on principles and practices of managing both people and technology to support an organization. The course will emphasize how to make an information technology infrastructure effective, efficient, and productive. The management of hardware, software, data, networks and other supporting IT functions will be studied.
Prerequisite(s): **None.**

Rationale for change: Content of WBIT 2000 does not depend on content from WBIT 1100. Removing the prerequisite will allow beginning students to take two courses in their first semester. The Operating Board voted to remove the prerequisite.

2009

The WebBSIT Operating Board examined two courses that seemed to have very similar content and determined that the original content of WBIT 4602 was effectively covered by the senior project course, WBIT 4030. Therefore, the Operating Board re-structured WBIT 4602 to address topics of emerging interest and importance to the IT discipline. The following program outcomes and learning objectives will be addressed in the revised course:

Program Outcome 4: Create and implement effective project plans.

-Critically consider the impact of emerging IT issues on project planning.

Program Outcome 5: Identify and investigate current and emerging technologies and assess their applicability to address individual and organizational needs.

-Critically consider emerging IT issues and their impact on existing IT discipline-related concepts and practices.

-Critically consider emerging IT issues and assess the related opportunities to provide IT solutions in new ways or to new domains.

-Investigate a current or emerging IT issue and assess its applicability to address individual and organizational needs.

Program Outcome 6: Analyze the impact of technology on individuals, organizations, and society.

-Critically consider the impact of emerging IT issues on the user.

-Analyze the impact of a current or emerging IT issue on individuals, organizations, and society.

-Demonstrate proficiency in assessing the impact of a current or emerging IT issue on both IT professionals and their constituencies.

Program Outcome 7: Collaborate in teams to accomplish common goals.

-Collaborate through discussions to more fully consider an IT issue.

Program Outcome 8: Communicate effectively and efficiently.

-Communicate ideas related to an IT issue effectively and efficiently in both discussion and more formal writing.

Current Catalog Description

WBIT 4602 IT Strategy, Design and Development (3-0-3)

Students will gain an understanding of the complexities of IT systems development and will demonstrate effective strategies commonly used by IT professionals. The course will include surveys of security issues, Internet technologies, web development software, e-commerce models, purchase and payment systems, interfaces with business systems, legal issues, international issues, and marketing and promotion of information technology systems. Students will develop prototypical systems.

Prerequisites: WBIT 3600, WBIT, WBIT 3111, and WBIT 4120

Change to Catalog Description

WBIT 4602 IT Seminar (3-0-3)

Students will participate in research and discussion on a topic of current interest. A term paper on the topic (or related subtopic) is required. A designated faculty member will select the topic in advance based on his/her expertise and lead the seminar.

Prerequisites: WBIT 3600, WBIT 3200, WBIT 3111, and WBIT 4120

Rational for change: The original content of WBIT 4602 is effectively covered by the senior project course, WBIT 4030. Therefore, WBIT 4602 can address topics of emerging interest and importance to the IT discipline. This change will eliminate some duplication between 4602 and 4030.

The WebBSIT Operating Board evaluated WBIT 4030 in light of the changes to WBIT 4602. It was determined that the program outcomes for the course were best addressed by a senior project or an industry internship rather than a portfolio.

Current Catalog Description
WBIT 4030 - Senior Project & Portfolio (3-0-3)

A capstone course for BSIT majors that includes completion of a digital portfolio, an electronic resume representing skills acquired and projects completed. The portfolio will be introduced in an earlier course and students will be expected to add to the portfolio selected assignments during their last few semesters. Faculty will include Portfolio comments and students will be expected to record reflections on accomplishments. Finally, in cooperation with the IT industry, students will be expected to secure an internship and document internship hours, objectives and supervisor evaluations in the Portfolio.
Prerequisite(s): Senior Standing.

Change to Catalog Description
WBIT 4030 – Senior Project (3-0-3)

A capstone course for WebBSIT majors, students will be expected to complete a final team or individual project. The project may be an approved industry, internship or a project developed and designed by faculty of the WebBSIT. Students will apply skills and knowledge from previous WebBSIT courses in project management, system design and development, digital media development, eCommerce, database design, and system integration.
Prerequisite(s): Senior Standing and Advisor Approval

Rational for change: The use of the portfolio described in the old 4030 course has been eliminated. The focus of this course is now on a capstone project which may take the form of a special project or an internship. The course title is modified slightly to remove reference to the portfolio.

While most students take WBIT 3510 as a prerequisite to WBIT 4520, they are allowed to take the course as a co-requisite. The Operating Board added language to the WBIT 4520 course description emphasizing the consequences of withdrawing from the co-requisite course, WBIT 3510.

Existing 4520

WBIT 4520 - Information Assurance and Security (3-0-3)

This course is an introduction to information assurance and security in computing. Topics include computer, network (distributed) system and cyber security, digital assets protection, data backup and disaster recovery, encryption, cryptography, computer virus, firewalls, terrorism and cyber crimes, legal, ethical and professional issues, risk management, information security design, implementation and maintenance.

Prerequisite: WBIT 3500 Architecture and Operating Systems

Pre or Co-requisite: WBIT 3510 Data Communication and Networking.

Revised 4520

WBIT 4520 - Information Assurance and Security (3-0-3)

This course is an introduction to information assurance and security in computing. Topics include computer, network (distributed) system and cyber security, digital assets protection, data backup and disaster recovery, encryption, cryptography, computer virus, firewalls, terrorism and cyber crimes, legal, ethical and professional issues, risk management, information security design, implementation and maintenance. **Note: If a student is taking WBIT 3510 as a co-requisite and subsequently withdraws from WBIT 3510, the student must also withdraw from WBIT 4520.**

Prerequisite: WBIT 3500 Architecture and Operating Systems

Pre or Co-requisite: WBIT 3510 Data Communication and Networking.

Rationale for change: The change to the course description clarifies for students the consequences of dropping WBIT 3510 when taking it as a co-requisite to WBIT 4520.

In response to student requests, the Operating Board examined the prerequisited to WBIT 3200. While some programming knowledge is desired, the program outcomes of WBIT 3200 do not depend heavily on programming. Therefore, the second programming course was changed to a co-requisite rather than a prerequisite. This change had a cascading effect on courses that required WBIT 3200 as a prerequisite. Therefore several courses required an adjustment in their prerequisites.

Existing 3200

WBIT 3200 - Database Design, Development and Deployment (3-0-3)

An advanced course in database design, development and deployment. Course emphasizes database design drawing distinctions between data modeling and process modeling using various modeling techniques including Entity-Relationship Modeling, Object Modeling and Data Flow Diagramming; database development using the relational model, normalization, and SQL; database deployment including control mechanisms, forms, reports, menus and web interfaces. Additional topics include procedures, functions, packages and triggers. Students will design, create and process a database to demonstrate competency in the course content.

Prerequisite(s): WBIT 2311.

Revised 3200

WBIT 3200 - Database Design, Development and Deployment (3-0-3)

An advanced course in database design, development and deployment. Course emphasizes database design drawing distinctions between data modeling and process modeling using various modeling techniques including Entity-Relationship Modeling, Object Modeling and Data Flow Diagramming; database development using the relational model, normalization, and SQL; database deployment including control mechanisms, forms, reports, menus and web interfaces. Additional topics include procedures, functions, packages and triggers. Students will design, create and process a database to demonstrate competency in the course content. **Note: If a student is taking WBIT 2311 as a co-requisite and subsequently withdraws from WBIT 2311, the student must also withdraw from WBIT 3200.**

Prerequisite(s): WBIT 1310

Pre or Co-requisite: WBIT 2311.

Rationale for change: While some programming experience is desireable before taking database design, a second programming class is not required preparation. However, to ensure that students do not delay taking their second programming course, requiring it as a co-requisite seems advisable.

Existing 4112

WBIT 4112 - Systems Acquisition, Integration and Implementation (3-0-3)

Most IT applications used by organizations are configured from components that have been purchased from third-party vendors. This includes both hardware components and, increasingly, software components. In this course, students will

study the component acquisition process, and methods and techniques for integrating these components into an existing IT infrastructure.
Prerequisite(s): WBIT 4520, WBIT 3200, WBIT 3110.

Revised 4112

WBIT 4112 - Systems Acquisition, Integration and Implementation (3-0-3)

Most IT applications used by organizations are configured from components that have been purchased from third-party vendors. This includes both hardware components and, increasingly, software components. In this course, students will study the component acquisition process, and methods and techniques for integrating these components into an existing IT infrastructure.
Prerequisite(s): WBIT 4520, **WBIT 3510,** WBIT 3200, WBIT 3110, **WBIT 2311**.

Rational for change: This change corrects a prerequisite problem that could arise should a student pass WBIT 4520 while taking WBIT 3510 as a co-requisite but fails 3510. WBIT 3510 should become a prerequisite for any course also listing WBIT 4520 as a prerequisite. This change corrects a prerequisite problem that could arise should a student pass WBIT 3200 while taking WBIT 2311 as a co-requisite but fails 2311. WBIT 2311 should become a prerequisite for any course also listing WBIT 3200 as a prerequisite.

Existing 4601

WBIT 4601 - Customer Relationship Management (3-0-3)

The use of IT applications has allowed many organizations to collect large amounts of data on their clients and to apply such data to improve the relationships with their customers. In this course, students will study customer relationship management systems, including the reasons for their emergence, the functionalities that they provide and the issues one would have to face to successfully introduce a Customer Relationship Management System into an organization.
Prerequisite(s): WBIT 3600, WBIT 3200.

Revised 4601

WBIT 4601 - Customer Relationship Management (3-0-3)

The use of IT applications has allowed many organizations to collect large amounts of data on their clients and to apply such data to improve the relationships with their customers. In this course, students will study customer relationship

management systems, including the reasons for their emergence, the functionalities that they provide and the issues one would have to face to successfully introduce a Customer Relationship Management System into an organization.
Prerequisite(s): WBIT 3600, WBIT 3200, **WBIT 2311**.

Rationale for change: This change corrects a prerequisite problem that could arise should a student pass WBIT 3200 while taking WBIT 2311 as a co-requisite but fails 2311. WBIT 2311 should become a prerequisite for any course also listing WBIT 3200 as a prerequisite.

Existing 4602

WBIT 4602 - IT Strategy, Design and Development (3-0-3)

Students will gain an understanding of the complexities of IT systems development and will demonstrate effective strategies commonly used by IT professionals. The course will include surveys of security issues, Internet technologies, web development software, e-commerce models, purchase and payment systems, interfaces with business systems, legal issues, international issues, and marketing and promotion of information technology systems. Students will develop prototypical systems.
Prerequisites: WBIT 3600, WBIT 3200, WBIT 3111 IT, and WBIT 4120

Revised 4602

WBIT 4602 - IT Strategy, Design and Development (3-0-3)

Students will gain an understanding of the complexities of IT systems development and will demonstrate effective strategies commonly used by IT professionals. The course will include surveys of security issues, Internet technologies, web development software, e-commerce models, purchase and payment systems, interfaces with business systems, legal issues, international issues, and marketing and promotion of information technology systems. Students will develop prototypical systems.
Prerequisites: WBIT 4120, WBIT 3600, WBIT 3200, WBIT 3111, **WBIT 2311**

Rationale for change: This change corrects a prerequisite problem that could arise should a student pass WBIT 3200 while taking WBIT 2311 as a co-requisite but fails 2311. WBIT 2311 should become a prerequisite for any course also listing WBIT 3200 as a prerequisite.