

Information Technology and Systems Major: Program Goals, Learning Outcomes, and Assessment Methods

The Faculty of the Computer Science, Information Systems, and Information Technology Department provide two undergraduate major programs. One major is Computer Science. The other is Information Technology and Systems. In this document we explicitly show the relationships among the Information Technology and Systems program goals, learning outcomes obtained in courses targeted towards particular program goals, and assessment methods that assure learning outcomes from courses.

Our ITS Program Goals are listed in Table 1. Figure 1 graphically describes the relationships among these program goals. Note that Program Goal 1: Develop ITS Competencies exists at the intersection of Program Goals 2, 3, 4, and 5. This means that Program Goal 1 is fulfilled by achieving Program Goals 2, 3, 4, and 5. The rest of this document clarifies these four goals, how they are achieved, and how they are assured. Table 2 shows example learning outcomes—that are achieved in courses targeted at achieving program goals. These example learning outcomes are categorized by their type of focus, and each type of focus is affiliated with a program goal. Table 3 (Parts A and B) shows the courses in the ITS program and the program goal foci that are associated with each course. Finally Table 4 shows the learning assessment methods that are used for each course.

	Information Technology and Systems Program Goals
1	Prepare students for employment in the Information Technology and Systems (ITS) field or for graduate study in the information sciences by developing ITS skills, knowledge, and abilities.
2	Provide students with both theoretical knowledge and skills-based proficiencies in the five core ITS competencies of software programming, hardware, data communications, data management, and systems analysis and design.
3	Provide students with fundamental knowledge and experience in business administration and management, so that graduates will be able to enable businesses and organizations.
4	Develop in students the analytic, critical thinking, and teamwork skills required of successful information professionals in contemporary organizations.
5	Educate students about interpersonal skills as well as the behavioral, social, and ethical aspects of information technology and systems.

Table 1: Information Technology and Systems Program Goals¹

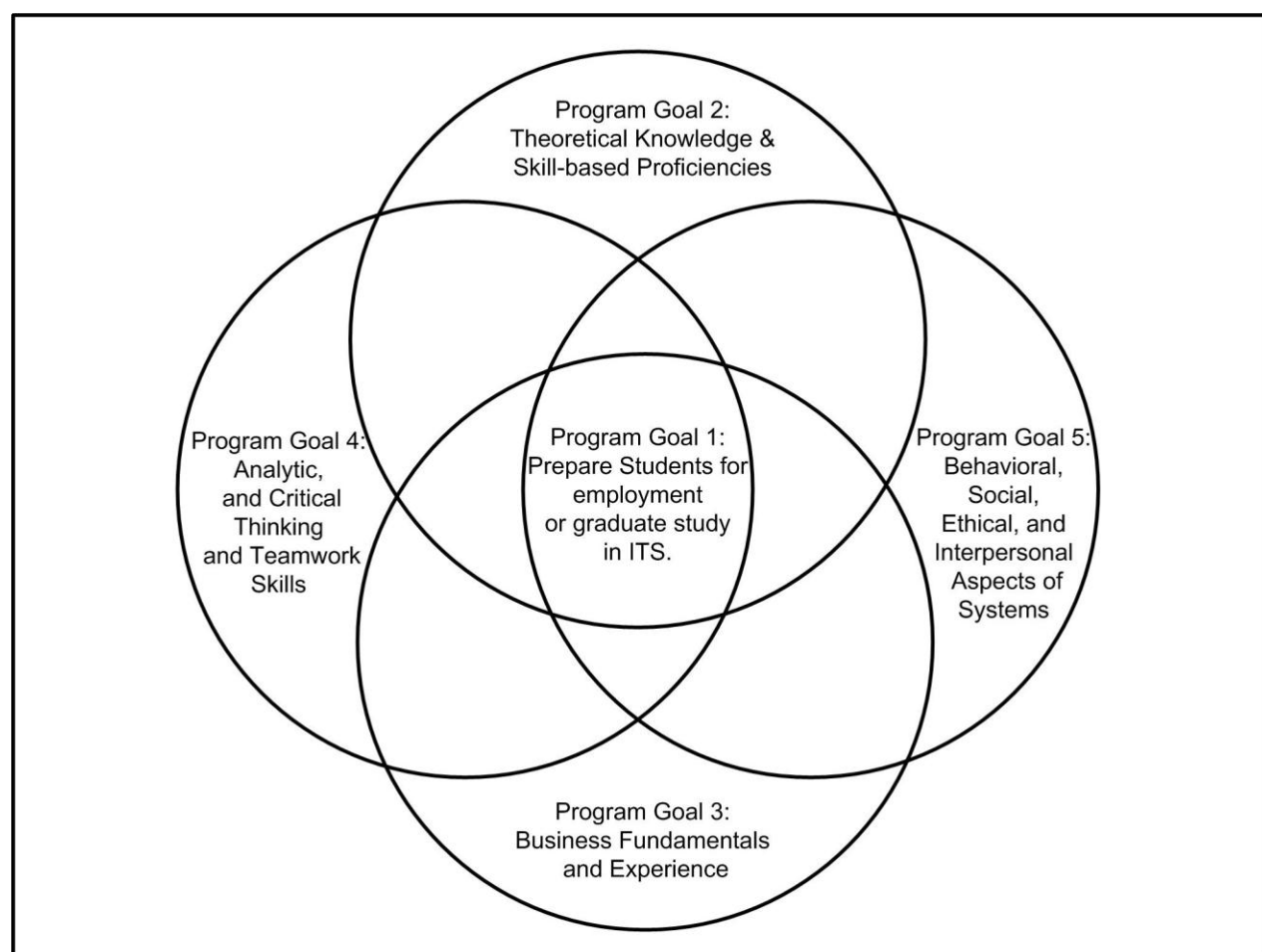


Figure 1: Relationships among Information Technology and Systems Program Goals²

ITS Program Goals: Focus & Learning Outcomes				
ITS Program Goal 1: Prepare students for employment or graduate study in ITS (fulfilled by Program Goals 2, 3, 4, & 5)				
	ITS Program Goal 2: Theoretical Knowledge and Skill-based Proficiencies			
Fo cu s	Application Development (AD)	Internet Systems Architecture and Development (ISAD)	Database Design and Administration (DDA)	Systems Infrastructure and Integration (SII)
Le arn ing Ou tco me	Programming principles, Objects, algorithms, modules, testing, application development, requirements, specifications, development, algorithmic design, data, object, and file structures. Client-server dev.	Web page development Web architecture design and development Design and development of multi-tiered architectures.	Modeling and design Construction, schema tools, DB systems Triggers, stored procedures, design and dev. of audit controls, security, safety, backup, repairs, replication	Computer systems hardware, Networking and telecommunications, LAN/WAN design and management, Systems software, operating system mgmt, Systems configuration, operation, and administration.
	ITS Program Goal 3: Business Fundamentals and Experience			
Fo cu s	Business Models (BM)	Functional Business Areas (FBA)	Evaluation of Business Performance (EBP)	
Le arn ing Ou tco me	Contemporary and emerging business models. Organizational theory, structure, and functions. System concepts and theories.	Accounting Finance Marketing Human Resources Logistics and manufacturing	Benchmarking. Value chain and value network analysis. Quality, effectiveness, and efficiency. Valuation of organizations. Evaluation of investment performance.	
	ITS Program Goal 4: Analytical and Critical Thinking and Team Skills			
Fo cu s	Course Goal OPS: <u>O</u> rganizational <u>P</u> roblem <u>S</u> olving	Course Goal CR: <u>C</u> reativity	Course Goal TWL: <u>T</u> eam <u>W</u> ork and <u>L</u> eadership	
Le arn ing Ou tco me s	Problem solving models, techniques, and approaches. Personal decision making. Critical thinking. Methods to collect, summarize, and interpret data. Statistical and mathematical methods.	Creativity concepts. Creativity techniques. The systems approach.	Building a team. Trusting and empowering. Encouraging. Developing and communicating a vision/mission. Setting and tracking team goals. Negotiating and facilitating. Team decision making. Operating in a virtual team. Being an effective leader.	
	ITS Program Goal 5: Behavioral, Social, Interpersonal, and Ethical Aspects of Systems			
Fo cu s	Interpersonal (I)	Ethics and Professionalism (EP)	Communication (CO)	
Le arn ing Ou tco me s	Listening Encouraging Motivating Operating in a global, culturally diverse environment.	Codes of conduct. Ethical theory. Leadership. Legal and regulatory standards. Professionalism – self-directed, leadership, time management. Professionalims – commitment to and completion of work.	Listening, observing, interviewing, and documenting. Abstraction and precise writing. Developing multimedia content. Writing memos, reports, and documentation. Giving effective presentations.	

Table 2: Program Goals: Foci and Learning Outcomes³

¹ The five program goals are drawn from the ITS mission statement and from the model of ITS graduate exit characteristics developed by the IS 2002 Model Curriculum and Guidelines for Undergraduate Degree Programs in Information Systems.

² Derived from IS 2002 Model Curriculum and Guidelines for Undergraduate Degree Programs in Information Systems, p. 13.

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Learning Outcome Foci for Each Course												
Course No.	R	IS	IT	Course Title	OPS	EP	CR	BM	FBA	EBP	I	
CMSC 110	X			Computing Studies Seminar								
CMSC 120	X			Computer Science 1 & Lab	X		X					
CMSC 121	X			Computer Science 2	X		X					
ITS 130	X			IT&S Concepts	X			X	X			X
ITS 210	X			Web Programming 1	X		X					
ITS 220	X			Web Programming 2	X		X					
ITS 321	X			Architecture of HW & SW								
ITS 406	X			Data Communications						X		X
ITS 408	X			Data Management	X							X
ITS 430	X			Systems Analysis & Design	X	X	X	X				X
ITS 452		X		Decision Support Systems								
ITS 492		X		Information Systems Project	X	X	X	X				X
ITS 428		X		Data Quality in Information Systems	X	X	X					
ITS 478		X		IT&S Policy	X	X	X	X	X	X		X
ITS 312			X	UNIX	X		X					
ITS 440			X	Technology Entrepreneurship	X	X	X	X	X	X		X
ITS 410			X	Systems Admin. & Mgmt.	X	X	X	X				
ITS 415			X	Internetworking	X	X	X					
ITS 477			X	IT&S and Society		X		X	X	X		X
			9	IT&S Electives ³								
		15	3	General Electives / Internships ⁴								
PHIL 101	X			Introduction to Philosophy	X							
PHIL 300	X			Ethics	X	X						
ENG 116	X			College Writing 1 ⁵								
ENG 117	X			College Writing 2								
MATH 241	X			Calculus 1	X							
MATH 130	X			Introduction to Statistics 1	X							
MATH 250	X			Discrete Mathematics 1	X							
ECON 101		X		Principles of Macroeconomics				X				
ECON 102		X		Principles of Microeconomics				X				
BUS 100	X			Intro. to Business & Mgmt.				X	X	X		X
BUS 340		X		Marketing Management				X	X	X		X
ACCT 203		X		Financial Accounting				X	X	X		X
ACCT 204		X		Managerial Accounting				X	X	X		X
	9	9	15	Core Liberal Studies ⁶								

Table 3 (Part A): Learning Outcome Foci for Each Course

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Coursework

R: Required for Major

IS: Information Systems Concentration

IT: Information Technology Concentration

Course Goals

OPS: Organizational Problem Solving

EP: Ethics and Professionalism

CR: Creativity

BM: Business Models

FBA: Functional Business Areas

EBP: Evaluation of Business Performance

I: Interpersonal

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Learning Outcome Foci for Each Course											
Course No.	R	IS	IT	Course Title	TWL	CO	AD	ISAD	DDA	SII	IS
CMSC 110	X			Computing Studies Seminar							
CMSC 120	X			Computer Science 1 & Lab			X				
CMSC 121	X			Computer Science 2			X				
ITS 130	X			IT&S Concepts		X		X			
ITS 210	X			Web Programming 1		X	X	X			
ITS 220	X			Web Programming 2		X	X	X			X
ITS 321	X			Architecture of Hardware & Software						X	
ITS 406	X			Data Communications						X	
ITS 408	X			Data Management	X	X	X	X	X	X	X
ITS 430	X			Systems Analysis & Design	X	X	X		X		X
ITS 452		X		Decision Support Systems	X	X	X	X	X		
ITS 492		X		Information Systems Project	X	X	X	X	X	X	X
ITS 428		X		Data Quality in Information Sys.		X	X		X		
ITS 478		X		IT&S Policy	X	X					X
ITS 312			X	UNIX		X	X			X	
ITS 440			X	Technology Entrepreneurship	X	X					
ITS 410			X	Systems Admin. & Management	X	X				X	
ITS 415			X	Internetworking 1	X	X				X	
ITS 477			X	IT&S and Society	X	X					
		9		IT&S Elective							
		15	3	General Electives / Internships							
PHIL 101	X			Introduction to Philosophy		X					
PHIL 300	X			Ethics		X					
ENG 116	X			College Writing 1 ⁶		X					
ENG 117	X			College Writing 2		X					
MATH 241	X			Calculus 1							
MATH 130	X			Introduction to Statistics 1							
MATH 250	X			Discrete Mathematics 1							
ECON 101		X		Principles of Macroeconomics							
ECON 102		X		Principles of Microeconomics							
BUS 100	X			Intro. to Business & Mgmt.							
BUS 340		X		Marketing Management							
ACCT 203		X		Financial Accounting							
ACCT 204		X		Managerial Accounting							
	9	9	15	Core Liberal Studies							

Table 3 (Part B): Learning Outcome Foci for Each Course

Coursework

R: Required for Major
IS: Information Systems Concentration
IT: Information Technology Concentration

Course Goals

TWL: Team Work and Leadership
CO: Communication
AD: Application Development
ISAD: Internet Systems Architecture and Development
DDA: Database Design and Administration
SII: Systems Infrastructure and Integration
IS: Systems Analysis and Design, Business Process Design, Systems Implementation, and IS Project Management

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Learning Assessment Methods For Each Course												
Course No.	R	IS	IT	Course Title	HW	EX	TP	FW	CS	CP	RP	
CMSC 110	X			Computing Studies Seminar								
CMSC 120	X			Computer Science 1 & Lab								
CMSC 121	X			Computer Science 2	X	X			X	X	X	
ITS 130	X			IT&S Concepts								
ITS 210	X			Web Programming 1	X	X				X		
ITS 220	X			Web Programming 2	X	X				X		
ITS 321	X			Architecture of HW & SW	X	X	X					
ITS 406	X			Data Communications	X	X			X	X	X	
ITS 408	X			Data Management								
ITS 430	X			Systems Analysis & Design	X	X			X	X		
ITS 452		X		Decision Support Systems								
ITS 492		X		Information Systems Project	X	X	X	X		X		
ITS 428		X		Data Quality in Information Systems	X	X	X	X	X	X		
ITS 478		X		IT&S Policy	X	X	X			X	X	
ITS 312			X	UNIX	X	X			X			
ITS 440			X	Technology Entrepreneurship	X		X	X		X		
ITS 410			X	Systems Admin. & Mgmt.	X	X			X			
ITS 415			X	Internetworking	X	X			X			
ITS 477			X	IT&S and Society	X		X	X		X	X	
			9	IT&S Electives ⁷								
		15	3	General Electives / Internships ⁸								
PHIL 101	X			Introduction to Philosophy	X	X	X			X		
PHIL 300	X			Ethics	X	X			X	X		
ENG 116	X			College Writing 1 ⁹	X	X				X		
ENG 117	X			College Writing 2	X	X	X			X		
MATH 241	X			Calculus 1	X	X						
MATH 130	X			Introduction to Statistics 1	X	X					X	
MATH 250	X			Discrete Mathematics 1	X	X						
ECON 101		X		Principles of Macroeconomics	X	X						
ECON 102		X		Principles of Microeconomics	X	X						
BUS 100	X			Intro. to Business & Mgmt.	X	X				X		
BUS 340		X		Marketing Management	X	X						
ACCT 203		X		Financial Accounting	X	X						
ACCT 204		X		Managerial Accounting	X	X						
	9	9	15	Core Liberal Studies ¹⁰								

Table 4: Learning Assessment Methods for Each Course

Learning Assessment Methods by Course

HW: Homework Assignments
EX: Examinations and Quizzes
TP: Term Papers
FW: Field Work
CS: Case Study Analysis

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CP: Class Participation
RP: Research Projects

³ Beginning in Fall 2007, students pursuing the IT concentration must complete 9 credit hours in IT&S electives.

⁴ Beginning in Fall 2007, students pursuing the IS concentration must complete 15 credit hours in general electives or internships; For IT students, the number of credits is 3.

⁵ Students who do not have basic writing skills take English 101 and then English 116; Average Students take English 116 and then 117; Students who are advanced take English 117 after testing out of 116.

⁶ Beginning in Fall 2007, all ITS students must take 9 credit hours in Core Liberal Studies; IS students must take an addition 9 credits and IT students must take an additional 15.

⁷ Beginning in Fall 2007, students pursuing the IT concentration must complete 9 credit hours in IT&S electives.

⁸ Beginning in Fall 2007, students pursuing the IS concentration must complete 15 credit hours in general electives or internships; For IT students, the number of credits is 3.

⁹ Students who do not have basic writing skills take English 101 and then English 116; Average Students take English 116 and then 117; Students who are advanced take English 117 after testing out of 116.

¹⁰ Beginning in Fall 2007, all ITS students must take 9 credit hours in Core Liberal Studies; IS students must take an addition 9 credits and IT students must take an additional 15.