A PROPOSAL FOR

Bachelor of Science Program
In
Information Technology[*]

Department of Computer Science and Engineering
School of Engineering and Computer Science
Oakland University

Summer 2003
Revised Fall 2003
Revised Winter 2004
Revised March 25, 2004
Revised October 28, 2004
Revised January 6, 2005

[*] Unanimously approved by the School of Engineering and Computer Science (SECS) faculty assembly on
September 5, 2003

List of Changes

The following changes have been made in this version of the proposal. These changes were made in response to suggestions/comments received from Senate Planning Committee and from senators during the first reading of the proposal on November 18, 2004. The changes are shown in bold.

1. The new general education requirements are now incorporated in the proposal. Please see Page 12. The Plan of Study form (Appendix D) is now based on new general education requirements.
2. A new rubric "CIT" is now used to indicate information technology courses.
3. Additional letters from industry are now included in the proposal. These letters are from:
   a. Ronald Bienkowski, Director, Product Development IT, DaimlerChrysler Corporation
   b. Amjad Hussain, VP, Information Technology, Handleman Company
   c. Larry Wehner, Process Executive, Manufacturing and Quality, EDS
   d. Anand Sivaraman, VP, Strategic Programs, Syntel Inc
   e. Preston Brooks, Software Architect and Software Project Manager, SAIC
4. A new letter from Mary Hapler of Compuware is also included. The letter indicates her satisfaction with the changes made in the proposal based on her suggestion.
5. The need for additional technology rooms is removed.
6. A plan to recruit underrepresented minorities is included in the proposal. (Page 14)
7. The date of SECS approval of the program is now mentioned on the front page. The proposal also includes a copy of the letter from SECS dean on this matter. (Appendix F)
8. The library needs are included in the proposal based on Professor Mildred Merz's report on library holdings. (Please see Library line item in budget on Page 17 and Appendix E)
9. Accreditation issue is further clarified. (Page 17)
10. The budget is modified to reflect the need of Department of Mathematics. It also uses 3% tuition increase in place of 5% as desired by the Senate Budget Committee. (Page 16 and 17)

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ABSTRACT

A new major, Bachelor of Science in Information Technology (BS in IT) is proposed to fill the void that lies between a major in Computer Science (offered by SECS) and a major in Management Information Systems (offered by SBA). Many of the students who are interested in computing careers find computer science too narrow, mathematical, and physical-science oriented, while MIS does not offer sufficient depth in technical content and is too focused on traditional business topics and culture. In the planned major, we will prepare students with sufficient technical strength and a comprehensive understanding of information technology practice in context to act as problem solvers in various settings. This will be achieved through three distinct components of the program. First, every student will be required to either do an industry internship or participate in an industry-sponsored project, or perform research under a faculty mentor. Second, the program will include a strong professional component to develop skills in technical communication, ethics and group work. Finally, every IT major will have a choice of an interdisciplinary track of upper division courses (12 credit hours) in an application area of IT. Two tracks on computer security and bioinformatics are planned now; other tracks will be added as the program grows.

The proposed BS in IT program is a part of the nation-wide trend to produce a well-trained IT workforce and many universities across the country have initiated undergraduate degree programs in IT in last few years. The growth of IT programs is reflected by the actions of the Computing Research Association (CRA) and Association of Computing Machinery (ACM), the premier professional body of computer scientists, who sponsored the formation of a community of IT deans to provide a forum for IT education in 2000. The proposed BS in IT program will fulfill the IT workforce needs in Southeast Michigan and the Midwest region. According to recent projections from the Department of Commerce IT is the only area where a substantial job growth is expected in the next decade.

The major will be offered by **Department of Computer Science and Engineering (CSE) who has faculty with teaching skills and research interests in information technology.** The program has been designed considering the requirements for ABET (Accreditation Board for Education in Technology) accreditation, the pioneering IT curricula of Rochester Institute of Technology (RIT), and the recommendations of the Society of Information Technology Education (SITE). Additionally, IT leaders from General Motors, DaimlerChrysler, Kelly Services, Compuware, and other local industries were consulted. The major in IT is expected to complement and act as a feeder to the existing Master of Science programs in Information Systems Engineering and Software Engineering. **The new major is also expected to offer the potential for growth in the department in the context of declining enrollments in computer science and projected long-term job growth in IT.**

1. RATIONALE

A.   Program Need

With information emerging as a fundamental driver of global business and economic growth, information technology (IT) has come to play a vital role in any organization's success. The demand for professionals with training and background in information technology has been growing steadily and is expected to continue to do so not withstanding the recent economic downturn. Reports from several industry and government sources point to a growing future need for IT workers. The long-term projections to year 2010 produced by the Bureau of Labor Statistics (BLS) indicate that seven of the ten fastest growing occupations over the next decade will be in the IT sector[1,2].

The proposed BS in IT program is a part of the nation-wide trend to produce a well-trained IT workforce and many universities across the country have initiated undergraduate degree programs in IT in last few years. In 2000, Computing Research Association (CRA) and Association of Computing Machinery (ACM), the premier professional body of computer scientists, sponsored the formation of a community of IT deans to provide a forum for IT education. The reasons for growing numbers of IT programs are to be found in job growth projections, not-withstanding the current downturn. According to a most recent study by John Sargent, Senior Policy Analyst, Technology Administration, IT is the only area where substantial job growth is expected in next ten years as shown in Figure 1 projections.
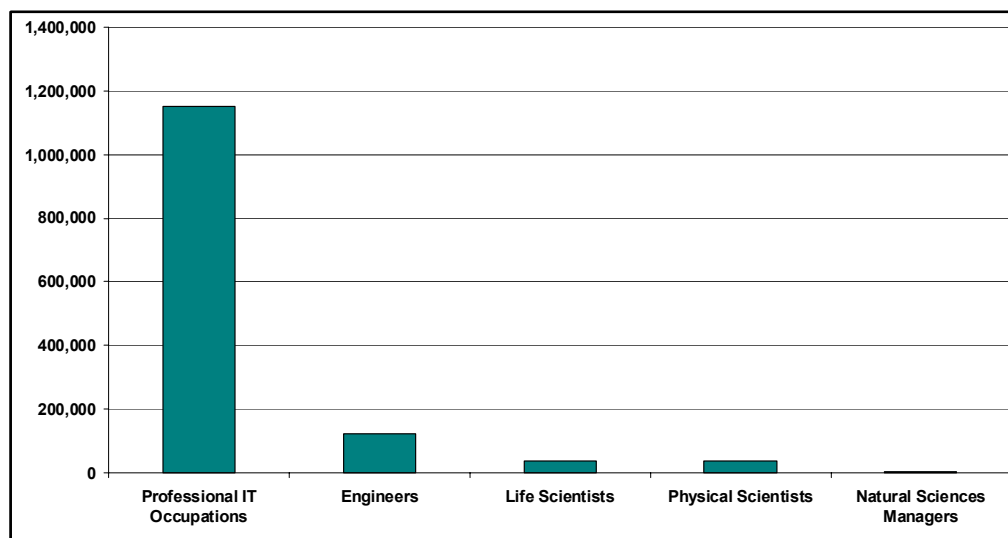
Figure 1. Occupational growth projection of IT, science and engineering job openings including new jobs plus net replacements for 2002-2012

The proposed BS in IT program is designed to fulfill the IT workforce needs in Southeast Michigan and the Midwest region. While the automotive manufacturing industry still has a much more disproportionate

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[1] Berman, Jay M., .Industry Output and Employment Projections to 2010,. *Monthly Labor Review*, November 2001.
[2] Hacker, Daniel, .Occupational Employment Projections to 2010,. *Monthly Labor Review*, November 2001.

presence in Oakland County, jobs in high technology and pharmaceuticals are growing fast, according to a recent study[3]. The latter industries now account for about one in every six jobs in the county, compared with one in 12 nationally. Thus, there is a great need for properly trained IT work force in the region served by Oakland University and beyond. During the discussions with the local industry leaders and advisory board members, we have found a strong support for the proposed program. The letters of support from some of the industry leaders are attached in Appendix A. Here, some of the excerpts from these letters are given. Keith Ensroth, Senior Director of Internet Systems, Kelly Services, states, "This program provides an excellent balance of the skills required for IT professionals in IT departments of both automotive and non-automotive companies. It reflects not only the appropriate grounding in the freshmen and sophomore years, but also the variety of application development and operational disciplines required to staff a large-scale IT organization." Dr. Ramasamy Uthurusamy, General Director, Emerging Technologies, Global Technology Management, General Motors strongly supports the program and feels "The goals of the program are sound and certainly in line with the needs of industry." Dr. Paul Besl of Information Systems and Services, General Motors states, "The proposed bachelor of science in information technology degree seems to me to broadly emphasize all the right kinds of directly relevant, applied knowledge that students will need in the real world. It indicates that OU's academic leaders are in tune with the needs of today's automotive industry as well as most other businesses."

B.   How the Program Will Help Promote the Role and Mission of the University

The planned major is consistent with the mission of the university which views distinctive undergraduate education central to its role. The major is also consistent with the recently adapted vision of the School of Engineering and Computer Science (SECS). The planned major in IT will fulfill the needs of local, state and national organizations and industries by producing a well educated undergraduates adept at IT.

C.   Program Goals

The goal of this program is to fill the void that lies between a major in Computer Science (offered by SECS) and a major in Management Information Systems (offered by SBA). Many of the students who are interested in computing careers find computer science too narrow, mathematical, and physical-science oriented, while MIS does not offer sufficient depth in technical content and is too focused on traditional business topics and culture. **In the planned major, we will prepare students with sufficient technical strength and a comprehensive understanding of information technology practice in context to act as problem solvers in various settings.** This will be achieved through three distinct components of the program. First, every student will be required to either do an industry internship or participate in an industry-sponsored project, or perform undergraduate research under the supervision of a faculty mentor. Second, the program will include a strong professional component to develop skills in technical communication, ethics and group work. Finally, it will contain an interdisciplinary track of upper division courses (12 credit hours) in an application area of IT to prepare well-rounded students who can communicate in the language of the industries in which they choose to work.

The additional goals of the program are: (i) increase the enrollment and student retention; (ii) create more visibility for the department and the university by being a leader; (iii) improve the participation of undergraduates in research and hands-on projects; and (iv) stimulate additional interaction with local industry.

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[3] Oakland Outlook,. Institute of Labor and Industrial Relations, University of Michigan, 2002
http://www.ilir.umich.edu/ilir/Docs/OaklandOutlook2002.pdf.

Table I presents a comparative picture of the three majors, CS, IT, and MIS, to illustrate how the three programs are different from each other.

Table I
Comparison of CS, IT (Proposed) and MIS Undergraduate Programs at OU

BS in Computer Science	BS in IT (Proposed)	BS in MIS
CS Core: (20 Credits) - CSE141 Problem Solving with Computers - CSE 171 Digital Logic and Microprocessors - CSE 230 Object Oriented Computing I - CSE 231 Object Oriented Computing II - CSE 378 Computer Hardware Design	**IT Core: (20 Credits)** - CSE/CIT 130 Intro to Programming - VB - CIT 220 Spreadsheet Programming & Reporting - CIT 247 Computer-Based Information Networks - CIT 251 Web Technologies - CSE/CIT 230 Object Oriented Computing I	**MIS Core: (19 Credits)** - MIS 200 Personal Productivity with IT - CSE/CIT 130 Intro to Programming – VB - MIS 300 Management Information Systems - MIS 304 Database Management - MIS 316 Systems Analysis
Professional Subjects (Required) (32) - CSE 331 Event-Driven Programming - CSE 335 Programming Languages - CSE 343 Theory of Computation - CSE 361 Design & Analysis of Algorithms - CSE 445 Database Systems - CSE 450 Operating Systems - SYS 317 Engineering Prob. & Statistics - CSE 402 Social Implications of Computing - CSE 480 Senior Capstone Design	**Concentration Courses (32 Credits)** - CIT 222 Interactive Multimedia Technology - CIT 248 Computer Systems - CIT 345 Database Design & Implementation - CIT 350 Human Computer Interaction - CIT 352/MIS 316 Systems Analysis - CIT 339 Software Engineering & Practice - CIT 280 Sophomore Project (2) - CSE/CIT 402 Professional Practice & Ethics (2) - CIT 480 Senior Capstone Project	**Business Core: (32 Credits)** - ENG 382 Business Writing - ECN 303 Managerial Economics - MKT 302 Marketing - ORG 330 Intro to Organizational Behavior - POM 343 Operations Management - FIN 322 Managerial Finance I - MGT 350 Legal Environment of Business - ORG 331 Intro to Management of Human Resources - MGT 435 Management Strategies and Policies
Professional Electives (12 Credits)	**IT Tracks (12 Credits)** - Bio Informatics - Systems Administration	**MIS Electives (9 Credits)**
Math & Science (29 Credits) - MTH 154-155 (Calculus I & II) - MTH 256 (Linear Algebra) - APM 263 (Discrete Math) - PHY 151-152 (Intro Physics) - PHY 158 (Physics Lab)	**Math & Science (24 Credits)** - MTH 122/154 Calculus - STA 226 Applied Statistics - APM 163 (Discrete Math) - Science Elective - Science Elective	**Math & Science (14 Credits)** - MTH 121 (Linear Programming) - MTH 122 (Calculus for the Social Sciences) - QMM 250 (Statistical Methods for Business)

General Education (24 Credits)	General Education (24 Credits)	General Education (24 Credits) Business Precore (20 Credits)
Free Electives (11 Credits)	Free Electives (12 Credits)	Free Electives (10 Credits)
Writing Proficiency (RHT 150 and RHT 160)	**Writing Proficiency** (RHT 150 and RHT 160)	**Writing Proficiency** (RHT 150 and RHT 160)

D.   Comparison to Similar Programs

Currently, there are about forty programs in the country that offer an undergraduate degree in information technology similar to the proposed program in varying degrees. Most of these programs were started in the last few years. Figure 2 broadly captures the core of the IT curriculum offered by these schools. Some of the nationally prominent programs are at Rochester Institute of Technology, Rensselaer Polytechnic Institute, George Mason University, Indiana University and Pennsylvania State University. In Michigan, only Central Michigan University offers a similar program. Lawrence Technological University has recently started a BS in IT program; however, the program is closer to the MIS program and is offered through their School of Management. Many universities in Michigan have started or are starting new programs in some focused area of information technology. Examples of such programs are BS in Software Engineering at University of Michigan – Dearborn and Michigan Technological University, and a BS in Computer Networking at Lake Superior State University.

Figure 2. IT core curriculum model common to most IT programs (From "Peter Denning, The IT School Movement, *Communications of the ACM*, August 2001)

There are many similarities between the proposed program and the IT major at Central Michigan University as both of them are modeled after the pioneering program of Rochester Institute of Technology. The major difference between the proposed program at OU and the existing program at Central Michigan University is that the IT majors at OU will need between 56-64 credits in IT courses while the IT majors at Central Michigan University need between 45-48 credits in IT courses. Another difference is the emphasis on project work and software engineering practice in our required course offerings.

E.   Source of Students

The program is expected to attract many new students to OU because of its innovative nature and potential jobs. **At the same time, many of the SECS students who drop out because they find the current majors not to their liking due to heavy emphasis on theory with a lack of context are expected to find the new program to their liking.** The proposed major is also expected to be attractive to other OU students because of its balance between technology and context. Many working information technology professionals with an associate degree are also expected to join the program.

Although it is difficult to accurately predict the number of students that will be attracted to this major, we provide here information for Rochester Institute of Technology (RIT) and Central Michigan University because of close similarities between the programs. The numbers for RIT are given in terms of the degrees awarded and are shown in Table II.

Table II
Bachelors Degrees Awarded in IT at RIT

Academic Year	Degrees Awarded
1998-1999	97
1999-2000	139
2000-2001	162
2001-2002	183
2002-2003	228

The numbers about the IT program at Central Michigan University are provided in terms of Student Credit Hours (SCH) for courses under IT rubric. These are shown in Table III.

Table III
IT Enrolment Pattern at Central Michigan University

Academic Year	Student Credit Hours for IT Courses
1999-2000	81
2000-2001	675
2001-2002	804
2002-2003	982
2003-2004	1221

One particular concern about any new program is whether it will attract new students or simply divert the existing students from one major to another. While it is hard to predict what might

happen, <u>the experience of RIT and Central Michigan University shows that the related programs are not much affected and the overall number of degrees awarded is increased</u>. Table IV illustrates this where the degrees awarded in three related majors, CS, IT and MIS, are shown from the introduction of the IT major at Central Michigan University.

Table IV
Bachelors Degrees Granted in CS, IT and MIS

Year	Central Michigan University			Rochester Institute of Tech.		
	CS	IT	MIS	CS	IT	MIS
2002-2003	31	23	78	81	228	21
2001-2002	22	12	112	55	183	44
2000-2001	27	1	90	87	162	61
1999-2000	26	0	83	44	139	42

Given the growth seen by the IT major at RIT and Central Michigan and the projections for future jobs of Figure 1, it is safe to conclude that the IT major will generate significant interest from students, and would add to overall degrees granted by Oakland University in programs related to computing and information systems without causing a major drop in any program.

2. SELF STUDY OF THE ACADEMIC UNIT

The Computer Science and Engineering Department in the School of Engineering and Computer Science currently offers two bachelor's and four master's programs. The bachelor's programs are a B.S. program in computer science accredited by the Computer Science Accreditation Board (CSAB) and a B.S. program in computer engineering accredited by the Accrediting Board for Engineering and Technology (ABET). The master's programs are an M.S. program in computer science and engineering, an M.S. program in embedded systems, an M.S. program in information systems engineering, and an M.S. program in software engineering. The department currently has 17 faculty members; it also has two open faculty positions.

a.   How the Goals of the Unit Are Served by the Program

The program is consistent with the goals of the department to serve the technologically skilled manpower needs of the Southeast Michigan and Oakland County in particular. The program will also enhance the department's visibility to attract a larger pool of students in other programs as well, and more research contracts and grants through interactions with the industry and with the faculty on campus from other units. **The program will help stabilize and grow the enrollments in the department because of future projections of job growth in IT.**

b.   Staffing Needs

The proposed major will be initially implemented with existing faculty; there is enough flexibility within the current faculty to teach both new IT courses and existing courses modified for IT requirements. A limited use of adjunct faculty might be needed. Some of the present CSE courses have been modified to suit the new program. These will be cross-listed under

the CSE and CIT rubrics. Only **six new courses** under the CIT rubric are planned. The new courses are scheduled for offering beginning with the second year of the program as shown in Table V where the progression of CIT rubric courses is shown for the first four years of the program. The courses in bold are the new courses. **The current faculty has designed these new courses and is eager to teach them. If the program grows beyond projections, then a need for new faculty members will arise only from the third year of the program when three additional new IT courses will be offered.** At the same time, we will need an additional half-time technical staff to help support IT labs that will be created for courses in multimedia and networking and security. We are confident in generating sufficient growth to cover for additional future faculty needs. This confidence is based on growth that has taken place at other schools with their IT programs. The department is aggressively pursuing experts from local industry to make them adjunct faculty to capitalize on their experience and knowledge in information technology to provide a unique flavor to the program.

Table V
A Possible Four-Year Schedule of IT Course Offerings

	Fall	Winter
Year 1	CIT 130	CIT 220
Year 2	CIT 130	CIT 220
	CIT 222	CIT 247
	CIT 230	CIT 251
		CIT 280
Year 3	CIT 130	CIT 220
	CIT 222	CIT 247
	CIT 230	CIT 251
	CIT 248	**CIT 280**
	CIT 345	**CIT 350**
	CIT Elective	CIT352/MIS 316
		CIT Elective
Year 4	CIT 130	CIT 220
	CIT 222	CIT 247
	CIT 230	CIT 251
	CIT 248	**CIT 280**
	CIT 345	**CIT 350**
	CIT Elective	CIT Elective
	CIT 337	CIT 480
	CIT 402	**CIT/MIS 450**
	CIT 494-I/R/E	

c.   Faculty Qualifications

The current CSE faculty members have the required expertise and flexibility within the teaching schedule to teach courses for this new program. A list of current full time and adjunct faculty with their teaching and research interests is available at the departmental website at http://www.cse.secs.oakland.edu.

d.   Library Holdings

A report on library needs from Professor Mildred Merz is included in Appendix E. As per the report, additional holdings, journals and online books might serve the students better. A budget for these additional holdings is included in the proposal.

e.   Classroom, Laboratory and/or Studio Space

No additional classrooms are needed. No additional computer laboratory space is needed. The program will be run primarily on the main campus; however, some classes, cross-listed with CS/CE program will be offered at the Macomb Center as is done now.

f.   Equipment

No new computer hardware and software are required for this program. Any special need arising in the future will be met through course fee money proposals, project funds, and gift money.

g.   Impact on the Current Programs Offered by the CSE Department

We anticipate some impact on the existing undergraduate programs in the department. Some decline in enrollment in the computer science program is expected in the beginning as the students discover the new major. **In the long run, however, we expect the new major to help grow all the programs in the department by the increased range of options/electives available to the students**.

3. PROGRAM PLAN

a.   Admission Requirements

Students must satisfy the requirements for admission to SECS as specified in the undergraduate catalog.

b.   Degree Requirements

The specific degree requirements are as follows:

- Complete at least 128 credits. At least 32 credits must be in courses at the 300-level or above.
- Complete the university general education requirements (**36 Credits**):
  - Exploration Knowledge Areas of Arts, Foreign Language & Culture, Global Perspective, Literature, Social Science, and Western Civilization   24 Cr
  - Writing requirement including RHT 160   4 Cr
  - Formal Reasoning (Satisfied by CIT 130)   0 Cr
  - Natural Science and Technology (with lab experience)   4 Cr
  - Knowledge Application   4 Cr
  - Capstone Experience (Satisfied by CIT 480)   0 Cr
- Math and Science requirements (**16 Credits**)

Calculus (MTH 122 or MTH 154)	4 Cr
Statistics (STA 226)	4 Cr
Mathematics for Information Technology (APM 163)	4 Cr
Science elective	4 Cr

- **20 credits** of IT core consisting of

Introduction to Programming with VB (CIT 130)	4 Cr
Spreadsheet Programming and Reporting (CIT 220)	4 Cr
Object-Oriented Computing I (CIT 230)	4 Cr
Computer Based Information Networks (CIT 247)	4 Cr
Web Programming (CIT 251)	4 Cr

- **32 credits** of IT concentration consisting of

Interactive Multimedia Technology (CIT 222)	4 Cr
Computer Systems (CIT 248)	4 Cr
Database Design and Implementation (CIT 345)	4 Cr
Human Computer Interaction (CIT 350)	4 Cr
Systems Analysis (CIT 352)	4 Cr
Sophomore Project (CIT 280)	2 Cr
Software Engineering and Practice (CIT 337)	4 Cr
Professional Practice (CIT 402)	2 Cr
Senior Capstone Project (CIT 480)	4 Cr

- **12 credits** in one of the elective tracks consisting of
  - o 8 credits of courses from one of the following tracks
    System Administration Track Courses

System Administration and Security (CIT 346)	4 Cr
Computer Communications (CSE 447)	4 Cr

Bioinformatics Track Courses

Genetics (Bio 341)	4 Cr
Bioinformatics (CSE 461)	4 Cr

  - o 4 credits of
    Internship (CIT 494-I), or Industrial Project (CIT 494-E), or

Undergraduate Research (CIT 494-R)	4 Cr

- Complete at least **8 credits** of coursework in management and communications courses from the following

IT Project Management (CIT/MIS 450)	4 Cr
Group Dynamics and Communication (COM 202)	4 Cr
Communication in Organizations (COM 304)	4 Cr

The total listed above adds to 124 credits. Assuming that one of the track electives (CSE 447 or Bio 341, or CSE 461) would satisfy the Knowledge Application component of the general education requirement, a student would have 8 credits of free electives. Those students who need to take RHT 150 would have only 4 credits of free electives.

c.   Course Descriptions

A complete description of all courses with the CIT rubric is given in Appendix B. The description for APM 163 and CSE 461 is also included as these are not in the existing catalog. The descriptions for the remaining courses offered by other departments and school/colleges is not included here; these are available in the current undergraduate catalog. **Each course is also labeled as new or modified to clearly indicate the new courses that the program is introducing**.

d.   Support of Other Departments

The Department of Mathematics has agreed to design and teach a new math course, APM 163, fulfilling the special needs of IT program. A course description for this is included in the list of courses in Appendix B. The department has reached an understanding with the School of Business regarding CIT 352, Systems Analysis. It will be cross-listed with MIS 316, and will be taught by SBA. CIT 450, IT Project Management, is a new course that will be cross-listed with a corresponding new course from MIS, MIS 450. This course will be **team taught** by CSE and MIS faculty to **enhance interaction between the two departments**. COM 202 and COM 304 are currently offered by the Department of Rhetoric, Communication and Journalism.

e.   Recruiting Plans

The program will be publicized through: (i) print and radio advertising, (ii) mailing brochures to local industries and high schools, (iii) departmental web site, and (iv) orientation and advising. **Special efforts will be made to recruit underrepresented minorities by publicizing the program through existing channels of Oakland University for this purpose and through DAPCEP (Detroit Area Pre-College Engineering Program). We will also use the contacts from the NSF supported REU (Research Experience for Undergraduates) program that we have been running since 2002 to recruit minority students. These contacts have proven useful; 30% of our REU participants have come from underrepresented groups.**

f.   Planned Enrollment Levels

A conservative estimate of enrollment in this program is **15 new lower division students and 10 upper division students per year**. **These numbers represent an incremental growth over the existing numbers in the current majors offered by the department**. **The upper division students will be transfer students. The transfer students will join the program from its third year when we will be offering junior courses of the IT curricula**. We expect a stable population of 70 students in the program at the end of fourth year of the program. These numbers are in line with the growth patterns of Central Michigan and RIT.

4. NEEDS AND COSTS OF THE PROGRAM

a.   Additional Resources for the Program

No additional resources in terms of faculty and staff are requested for the first two years of the program; however, one part time instructor and one graduate student will be needed to help run the classes and labs in the second year. If the enrollment projection holds true, then a new faculty position will be needed in the third year. Beginning with the third year, one half-time technical staff would be needed to manage and maintain additional computing labs.
The budget for overload teaching of APM 163 is included. **If the program grows beyond expectation, then a half-time faculty position in Mathematics would be needed after four years to teach APM 163 twice a year.** The progression of courses given in Table V and a sample four-year student schedule shown in Table VI justify the need for additional resources. A plan of study for IT majors is shown in Appendix D.

Table VI
A Sample Four-Year Schedule

Year 1	
Fall (16 Cr.)	Winter (16 Cr)
• MTH 122 or 154 • Gen Ed (Art) • Gen Ed (S&T) • CIT 130	• APM 163 • Gen Ed (FLC) • Science Elective • CIT 220
Year 2	
Fall (16 Cr.)	Winter (14 Cr.)
• Gen Ed (GP) • STA 226 • CIT 230 • CIT 222	• Gen Ed (Lit) • CIT 247 • CIT 251 • CIT 280
Year 3	
Fall (16 Cr.)	Winter (16 Cr.)
• Gen Ed (WC) • CIT 248 • CIT 345 • CIT Track Elective 1	• CIT 350 • CIT 352/MIS 316 • CIT Track Elective 2 • Gen Ed (SS)
Year 4	
Fall (18 Cr.)	Winter (16 Cr.)
• RHT 160 • CIT 402 • IT Track Elective 3 • COM 202/304 • Free Elective	• CIT 480 • CIT/MIS 450 • CIT 337 • Free Elective

No new laboratory space is being requested. The needs for special hardware or software for the program will be mostly met through course-fee monies and gifts.

b.   How the Resources will be met?

The program is expected to generate sufficient revenues for self-sufficiency as shown in Table VII. **The first two years of the program are virtually free from additional costs**. The student numbers in the table are based on assuming **15 new lower division students every year and 10 transfer upper division students from community colleges for the third and fourth year of the program**. **These numbers represent incremental growth taking into account any shifts in majors from existing students.** It is further assumed that **only 10 out of the 15 lower division students will move to the upper division status** to provide **pessimistic estimates** for revenue. **The calculations do not include estimates for credit hours due to non-majors**. The scenario presented in Table VII is the likely scenario; we, however, present two additional scenarios, best-case and worst-case scenarios as attachments to this proposal.

Table VII. Estimated Revenue and expenses for the Proposed major in Information Technology

Proforma Income Statement		(Revenue Calculated by the Credit Hours of the IT Majors) Average Case Scenario			
Program Title		SECS BS in IT			
Program Type: (New, INC,CRCE)		New / INC / MUC			
Year #		FY2005			
Incremental Analysis		**FY05**	**FY06**	**FY07**	**FY08**
Fund Number		**Year 1**	**Year 2**	**Year 3**	**Year 4**
		Budget Request	**Budget Request**	**Budget Request**	**Budget Request**
Revenue Variables:					
Headcount		15	30	50	70
Total Credit Hours		420	840	1400	1960
Undergraduate : Lower Division		420	840	840	840
Undergraduate : Upper Division		0	0	560	1120
Tuition Rate Per Credit Hour					
Undergraduate : Lower Division		$162.25	$167.12	$172.13	$179.29
Undergraduate : Upper Division		$178.00	$183.34	$188.84	$194.51
Enrollment Fees per Semester		$147.00	$147.00	$147.00	$147.00
Course Fees		$13.50	$13.50	$13.50	$13.50
Revenue					
Tuition		$68,145.00	$140,378.70	$250,340.57	$366,773.82
Enrollment Fees		$4,410.00	$8,820.00	$14,700.00	$20,580.00
Course Fees		$5,670.00	$11,340.00	$18,900.00	$26,460.00
Other Fees					
Total Revenue		**$78,225.00**	**$160,538.70**	**$283,940.57**	**$413,813.82**
Expenses	**ACCT**				
Salaries/Wages					
Faculty Inload (Replacement Costs)	6301				
Faculty Salaries	6101			$70,000.00	$70,000.00
Faculty Overload	6301	$6,000.00	$6,000.00	$6,000.00	$6,000.00
Part-time Faculty	6301		$8,000.00	$4,000.00	$8,000.00
Visiting Faculty	6101				
Administrative	6201			$23,000.00	$23,000.00
Administrative - IC	6221				
Clerical	6211				
Wages	6401				
Student	6501				
Graduate Assistant	6311		$6,500.00	$6,500.00	$6,500.00
Out of Classification	6401				
Overtime	6401				
Total Salary Expenses			*$14,500.00*	*$103,500.00*	*$107,500.00*
Fringe Benefits	6701	$474.00	$1,166.00	$38,049.80	$38,395.80
Total Salary and Fringe Benefits		***$6,474.00***	***$21,666.00***	***$147,549.80***	***$151,895.80***
Operating Expenses					

Supplies and Services	7101		$5,000.00	$5,000.00	$5,000.00
Graduate Assistant Tuition	7101		$5,600.00	$5,600.00	$5,600.00
Travel	7201				
Telephone	7301				
Equipment	7501				
Library	7401	$6,400.00	$6,875.00	$7,375.00	$7,905.00
Total Operating Expenses		*$6,400.00*	*$17,475.00*	*$17,975.00*	*$18,505.00*
Total Expenses		$12,874.00	$39,141.00	$165,524.80	$170,400.80
Net Income/Loss		$65,351.00	$121,397.70	$118,415.77	$243413.02
Percentage of Expenses to Tuition		18.89	27.88	66.12	46.46

c.   Anticipated Revenues from the Program

The estimated revenues are shown in Table VII. The revenue estimates are based on a yearly enrolment of 15 new, incremental lower-division students and 10 upper-division, transfer students in the program in its third and fourth years. The credit hours are based on the sample four year student study plan shown earlier in Table V. This assumption is in line with the credit hour load of our students. The anticipated revenues do not include credit hours due to non-IT majors who will take some of the IT rubric courses as electives.

d.   Analyze Increased Support from the Program to the University

The proposed program will generate a net income for the university from its first year of implementation.

5. IMPLEMENTATION

We would like to start the program from Fall 2005. There should not be any logistical problem for doing so because the department currently offers some of the core courses for the proposed program albeit under a different rubric. The way IT courses will be phased in is shown in Table V on previous pages.

6. ASSESSMENT & ACCREDITATION

The School of Engineering and Computer Science has an assessment process in place that serves the school for its current accreditation requirements by ABET. Details of SECS assessment process are available at http://www2.oakland.edu/secs/assessment/default.htm. We will use the same process to assess the IT program. Following the countrywide growth of IT majors, ABET is developing a set of guidelines for such programs. Our goal will be to obtain ABET accreditation after graduating at least two classes of IT majors. **In the interim, the students joining the program will be clearly advised about the non-accreditation status of the program; however, this shouldn't present a problem to students because accreditation is not that important in computer science and information technology programs as it is in engineering programs**.

7. Graduate Study and Occupational Options for IT Graduates

The IT jobs are found in industry, government, business and service sectors. Typical job titles for IT graduates include application developer, instructional designer, network and system administrator, database administrator, user support specialist, multimedia and web developer, and web master. Many IT graduates work for small companies where they end up doing a variety of job functions related to computing and IT.

The graduate study options for IT graduates include pursuing a master's level work in IT or Software Engineering to further their technical skills and knowledge. For example, the IT majors would be able to enroll in our current MS programs in Information Systems Engineering or Software Engineering. Many other universities offer similar masters.

Many IT graduates may opt for management skills at the master's level. The School of Business at OU currently offers MS in Information Technology Management. Similar programs are available at many other institutions as well. These types of programs appear appropriate for IT majors seeking to move into management track. Thus, an IT graduate will have technical and management tracks open to her for further studies.

EDS

December 9, 2004

Ishwar K. Sethi
Professor and Chair
Department of Computer Science and Engineering
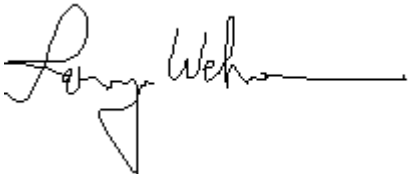Oakland University
Rochester, MI 48309

Dear Dr. Sethi,

I have reviewed the proposal for a Bachelor of Science Program in Information Technology. As a leader in EDS, a $20B IT Services company, I have seen the impact of the globalization of the IT industry. This has caused a shift in the skill requirements of the workforce in Michigan, and the United States. This shift is a move from traditional computer science programming skills, to that of higher level technical and specialized IT skills such as systems solution development, systems architecture, systems integration, systems administration and project management.

The traditional computer science language programming skills are easily and more cheaply acquired through other centers in the globe such as India, China and Singapore. The higher level and specialized IT skills are less available in these other centers, and typically are required to be close to the customer and their business process. The IT industry is continuing to grow in Michigan and the US, and the aging workforce is increasing the demand for these higher level and specialized skills.

I believe the proposed program addresses the demand for these skills in the IT industry and will provide graduates to companies in Michigan like EDS.

Sincerely,

Larry Wehner
Process Executive, Manufacturing and Quality
EDS
5555 New King St., M/S: 3A
Troy, MI 48098

Handleman Company
Channel of Choice

Nov 22, 2004

Ishwar K. Sethi
Professor and Chair
Department of Computer Science & Engineering
Oakland University
Rochester, MI 48309

Dr Sethi,

Thank you for the opportunity to review the proposed Bachelor of Science Program in Information Technology.

I am the Vice President of Information Technology at Handleman. Headquartered in Troy, MI, Handleman Company (NYSE: HDL) , with annual sales over $1.3 billion, is "the Channel of Choice" for distributing prerecorded music to mass merchants in the United States, United Kingdom, Canada, Brazil and Argentina. As a category manager, Handleman Company manages a broad assortment of titles required to optimize sales and inventory productivity in retail stores and provides direct-to-store shipments, marketing of the selections and in-store merchandising.

I have been concerned that the focus in many Computer Science programs in Greater Detroit area has been on the engineering side of the discipline. This program provides the right balance of the skills required for IT professionals in both product and service oriented companies.

I think this program will provide opportunity to the High School graduates in Michigan to go for a well balanced CS undergraduate program and will in turn provide qualified candidates to fill in the IT positions at local companies.

I look forward to the successful implementation of this program.

Regards,

Amjad Hussain

Amjad Hussain
Vice President Information Technology
Handleman Company
Tel: 248-362-4400, x 245
Mobile/Pager: 586-530-1254
www.handleman.com

GM

Paul J. Besl, Ph.D.
Visualization & Virtual Reality Architect
General Motors, Information Systems & Services
30200 Mound Road, Mail Stop: 480-111-E50
Warren, MI 48090
586-986-3722
Fax: 586-986-1473
paul.besl@gm.com

To Whom It May Concern:

GM strongly supports the proposal for the new "BS in IT" degree at Oakland University. Some computer-oriented baccalaureate programs at other schools put a heavy emphasis on computer hardware over software while others may focus on theoretical computer science. Unfortunately, it still happens that many degree programs do not adequately prepare students for the type of work that they will actually be doing in industry after graduation. The proposed bachelor of science in information technology degree seems to me to broadly emphasize all the right kinds of directly relevant, applied knowledge that students will need in the real world. It indicates that OU's academic leaders are in tune with the needs of today's automotive industry as well as most other businesses. A student successfully completing the type of coursework outlined in this proposal would very likely become a strong contributor in any IT department.

If I can offer any additional information in support of this proposal, please do not hesitate to contact me.

Sincerely,

Paul J Besl

Paul J. Besl, Ph.D.

KELLY
SERVICES

September 8, 2003

Ishwar K. Sethi
Professor and Chair
Department of Computer Science & Engineering
Oakland University
Rochester, MI 48309

Dear Dr. Sethi,

Thank you for the opportunity to review the proposed Bachelor of Science Program in Information Technology. As a senior director in the IT department of a non-automotive company in Michigan, I have been concerned that the focus in computer science in the metro Detroit area has tended to be strongly geared toward the engineering side of our discipline. Michigan's economic balance will come from a variety of businesses. Many of these companies, such as Kelly Services, do not develop technology solutions as their direct product. However, all of them require a skilled IT workforce to remain competitive.

This program provides an excellent balance of the skills required for IT professionals in IT departments of both automotive and non-automotive companies. It reflects not only the appropriate grounding in the freshmen and sophomore years, but also the variety of application development and operational disciplines required to staff a large-scale IT organization.

I also strongly believe in developing local talent to strengthen the Michigan economy. We have an improving cadre of high-school seniors that need advanced education in order to be prepared to function in our economy. I find it sad to see these talented young people move out of state while we recruit from around the country and around the world to fill key positions in our companies.

I look forward to seeing the results of this very important program.

Sincerely,

Keith Ensroth
Senior Director of Internet Systems
Kelly Services, Inc.

DEEP VIEW SYSTEMS
decision logic software

Dr. Ishwar K. Sethi
Professor and Chair
Department of Computer Science & Engineering
Oakland University

September 16, 2003

Dear Dr Sethi,

I have reviewed the description of your proposed new Bachelor of Science program in Information Technology and would like to offer our recommendation of support for this effort.

As your proposals notes, there is a definite long-term need for a skilled pool of talent, well trained in the latest information technology tools and techniques. Information technology continues to grow into new roles and applications and the continuing competitive standing of the region served by Oakland University will demand the talent necessary to remain in a leading position.

I commend your and your staff for having the foresight to anticipate these needs and respond with such new and innovative programs. On behalf of Deep View Systems, I wish you much success in this new degree program.

Sincerely,

Ken McCloskey
Principal Software Analyst
Deep View Systems, LLC

September 26, 2003

Prof. Ishwar K. Sethi
Professor and Chair
Department of Computer Science & Engineering
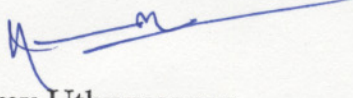Oakland University
Rochester, MI 48309

Dear Prof. Sethi,

Thank you for sharing with me your department's proposal for a Bachelor of Science Program in Information Technology (IT). I have reviewed the proposal and it is my pleasure to convey my approbation on this significant initiative. The goals of the program are sound and certainly in line with the needs of industry.

General Motors and the automotive industry in general are in need of a well-trained IT workforce to succeed in this intensely competitive global market. IT now plays a significant role in all industries and having a workforce that has a comprehensive technical understanding of IT practice in context to provide practical business solutions is a basic requirement. The proposed program's intent to prepare students for this with industry interactions and training in interdisciplinary knowledge to develop proper IT applications and more importantly acquiring technical communications and project management skills will definitely enable the students to succeed in an industrial setting.

I strongly support the proposed program. Please let me know if I can be of any help as you seek the approval of the Oakland University Senate for this innovative program.

Wishing you the best for it success,

Dr. Ramasamy Uthurusamy
General Director, Emerging Technologies
Global Technology Management

COMPUWARE CORPORATION
Corporate Headquarters
One Campus Martius
Detroit, Michigan 48226-5099
313-227-7300

COMPUWARE.®

September 17, 2003

Ishwar K. Sethi
Professor and Chair Dept. of Computer Science & Engineering
Oakland University
Rochester, MI 48309

Dear Mr. Sethi;

I have reviewed the proposal for the BS in Information Technology program at Oakland University
and I am supportive of it.   With one exception, the graduates of this program are very likely to
meet the needs and standards of the industry. I recommend you add a track for Software
Development and Management. This track should include instruction and laboratory work in
business systems analysis, requirements definition, design and development, as well as testing
and quality assurance for system functionality and performance. Program participants who elect
the Software Development and Management track will obtain a good grounding in the disciplines
required to work in the IT departments of large organizations.

Sincerely,

Mary Hepler
Sr. Vice President
Worldwide Services/Offerings Development
Compuware Corporation

December 17, 2004

Dr. Ishwar K. Sethi
Professor and Chair
Department of Computer Science and Engineering
Oakland University
Rochester, MI 48309

Dear Dr. Sethi:

Thank you very much for reviewing in greater detail the proposed Bachelor of Science Program in Information Technology. I believe the enhancements your department made to the program address the concerns expressed in my earlier letter. Specifically, three courses in the program, IT 352 (System Analysis), IT 337 (Software Engineering and Practice), and IT 450 (IT Project Management) should provide the knowledge base needed for your graduates to begin careers in business information technology.

I appreciate the opportunity to have participated in the development of this much needed program for the Department of Computer Science and Engineering at Oakland University. I wish you the best as you initiate the new program.

Sincerely yours,

Mary L. Hepler
Senior Vice President, Professional Services
Compuware Corporation

DAIMLERCHRYSLER

DaimlerChrysler Corporation

December 10, 2004

Dr. Ishwar Sethi
Professor and Chair
Department of Computer Science and Engineering
Oakland University
Rochester, MI

Dear Professor Sethi:

I reviewed your proposed BSIT Program and applaud you that, despite considerable pressure to conduct research, you emphasize the idea that the principal product of educational institutions remains well educated graduates. If the graduates are to work in industry, the gap between the viewpoints of education and industry must be closed within the educational institution's curricula. Historically, universities have offered degrees with a strong foundation on theory and concentration on scientific research. While such education is ample preparation for academic careers, experience has shown that a combination of classroom and business training are requisite to industrial careers. Without practical exposure, graduates are not fully prepared for their new jobs. Hence, your proposed BSIT will be of significant interest to the Michigan area employers who are searching for graduates with an application focus.

I am particularly encouraged to note that you followed the ABET guidelines in designing the program and that the program is housed in the Department of Computer Science and Engineering which, I believe, ought to provide considerable strength for students to be exposed to Engineering applications. In addition, the idea of requiring every student to apply theoretical constructs to problem solving business situations is particularly important. Therefore, the industry internship or the industrial sponsored project requirement will add considerable strength to the curriculum.

In today's climate of global competition, Michigan industry needs IT graduates (professionals) who are able to add value for a company by solving business problems with minimum on-the-job training. The proposed BSIT has the potential to produce such graduates which, in my opinion, will be an important asset to industry throughout Michigan seeking such talent.

Please contact me if you have any questions.

Sincerely,

Ronald J. Bienkowski

Ronald J. Bienkowski
Director, Product Development IT
Information Technology Management
DaimlerChrysler Corporation
800 Chrysler Drive East
Auburn Hills, MI 48326-2757 USA
Office: 248-576-2813
e-mail: rjb11@dcx.com

SYNTEL
⁖Consider IT Done⁰

HEADQUARTERS
525 E. Big Beaver Road
Suite 300
Troy, MI 48083
tel: 248/619 2600
fax: 248/619-2888
www.syntelinc.com

12/06/2004
Dr. Ishwar Sethi
Professor and Chair
Department of Computer Science & Engineering
Oakland University
Rochester, MI

Dear Dr. Sethi

It was a pleasure to meet you and I was very impressed with your foresight in planning on programs that will meet the emerging needs of businesses in the local area.

I have had a chance to review the proposed Bachelor of Science Program in Information Technology, and believe that what you plan to cover is a fairly detailed and exhaustive curriculum that will adequately prepare students for a career in IT. Notwithstanding the recent economic slowdown and the resultant difficult job market, IT will continue to be an area of skill shortage and if projections of industry analysts are any indication, the gap in demand and supply for IT professionals will likely grow.

Students who pursue a Bachelors Program in IT will have a head start in being considered for such careers in IT and your proposed course content strikes an excellent balance of the skills required. The Michigan area has a high need for qualified IT talent to support the concentration of manufacturing/ automotive industries, and the proposed course is well equipped to service that need.

I will eagerly await the progress and results of your first few batches, please do keep me posted. Let me know if there are ways in which Syntel can be involved in the success of this Program.

Best Regards

Anand Sivaraman
Vice President-Strategic Programs
Office of the CEO
Syntel Inc
248 619 3567 (w)
248 396 8965 ©
www.syntelinc.com
Consider IT Done

November 28, 2004

Dr. Ishwar Sethi, Chair, Department of CSE
Oakland University
Rochester, MI 48309

Dear Dr. Sethi,

As a practicing Software Architect and Software Project Manager, I see a significant need for the Bachelor's Degree in Information Technology (BSIT) proposed by the CSE of Oakland University. My company, Science Applications International Corporation (SAIC), is the nation's largest employee-owned technology company, with over 44,000 employees worldwide, and annual revenue of over $6 Billion. SAIC is a Fortune 500 systems integrator and software development company with both government and commercial contracts. SAIC is currently teamed with The Boeing Company as Lead Systems Integrator (LSI) in the US Army's Future Combat Systems Program ($15 Billion). As LSI I am currently overseeing the systems requirements modeling for all Manned Ground Vehicles. SAIC is currently planning to establish a major presence and diverse business base within Southeast Michigan.
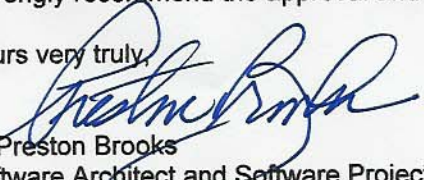
As is true with most technology-intensive companies, prior job experience in wrestling with real-world technology problems is a key recruiting requirement. It is also a key requirement for new employees that they have a good "fit" for the team-oriented projects and problem-solving that is the hallmark of SAIC's technology development. Both of these skills must be based upon a solid technical foundation in the Information or Computer Sciences.

The proposed BSIT provides the requisite industry and team experience opportunities, as well as a firm grounding in Information and Computer Science core knowledge. Having taught in the CSE as a Special Lecturer for the past two Sessions, the students have responded with great enthusiasm to course material that reflects current industry thinking and practice. Many of the students have the clear objective of improving their employability and job skills for local industry. They believe correctly that the team approach to problem solving and collaboration will help them more easily assimilate into the industry environment. The BSIT enhances the ability of Oakland University to compete both academically and financially within Southeastern Michigan. The BSIT will in no way detract from those students seeking a more research-oriented professional career, leading to advanced degrees in Computer Science.

Internships and joint student-industry engineer projects both add significantly to the student's employability and value to local IT companies. This experience is also valuable for the industry engineers because it acquaints them with the latest technologies being developed within the Universities. The BSIT will promote closer collaboration with local industry and will facilitate expanded industry funding of joint projects, internships and scholarships.

I strongly recommend the approval and offering of the BSIT proposed by Dr. Sethi.

Yours very truly,

/s/ Preston Brooks
Software Architect and Software Project Manager
SAIC
35875 Mound Road,
Sterling Heights, MI 48375

Appendix B

Description of Courses

CIT 130   Introduction to Computer Programming   (4 Cr) EXISTING
Introduction to digital computers and algorithmic programming. Topics include: data storage and manipulation control structures, functions and subprogramming. Introduction to object oriented programming. **(Cross-listed with CSE 130)** Prerequisite: MTH 012 or equivalent.

CIT 220   Spreadsheet Programming and Reporting   (4 Cr) EXISTING-MODIFIED
Introduction to business applications using Visual Basic. Emphasis is on structured programming for automating word processing and spreadsheet applications such as Microsoft Word and Excel, including creating reports using a report writer for database record sets from integrated business applications. Topics include Office Automation events, properties, methods, and programming techniques, as well as an introduction to Lotus Notes. **(Cross-listed with CSE 220)** Prerequisite: CIT 130 and MTH 122 or equivalent.

CIT 222   Interactive Digital Media   (4 Cr)   NEW
Introduction to basics of digital image, audio, and video techniques. Multimedia authoring tools. Creation of interactive multimedia content and applications. Prerequisite: CIT 130.

CIT 230   Object Oriented Computing I   (4 Cr) EXISTING
Introduction to object-oriented computer programming using a high-level programming language such as Java. Classes, member functions, inheritance, polymorphism and operator overloading. Design methodologies and introduction to software engineering principles and practices. Basic data structures are introduced. **(Cross-listed with CSE 230)** Prerequisite: CIT 130 or CSE 141

CIT 247   Computer-Based Information Networks   (4 Cr) EXISTING
An introduction to networking methodologies and implementation. Topics covered include peer-to-peer networking, server/client networking, intranets, wide area networks, necessary communications hardware, and Internet servers. These topics will be applied using various platforms such as Microsoft, Macintosh, Novell Netware, and Unix Networking systems. **(Cross-listed with CSE 247)** Prerequisite: CIT 230

CIT 248   Computer Systems   (4 Cr)   NEW
Introduction to computer systems. Topics cover computer system components including hardware components including motherboards, storage devices, memory, graphics accelerators, device and communications interfaces, and CISC and RISC processors, operating systems and network operating systems such as Microsoft, Unix, Linux, OS/2, Mac, Netware, and Citrix, as well as feasible configurations for standalone and networked systems. Issues in cost, performance, security, and compatibility are also considered. Prerequisite: CIT 230

CIT 251   Web Programming   (4 Cr)   EXISTING
An introduction to web technologies. Topics covered include use of modern web development tools, Hypertext Markup Language (HTML), server-side processing, and client-side processing using languages such as JavaScript. Students will use these tools to create interactive and dynamic web sites. **(Cross-listed with CSE 251)** Prerequisite: CIT 230

CIT 280   Sophomore Project   (2 Cr)   NEW
A team-oriented project work consisting of a small project to build skills in needs assessment, group problem solving, and written and oral technical presentations. Prerequisites: CIT 220 and 251.

CIT 337   Software Engineering and Practice   (4 Cr)   EXISTING-MODIFIED
Introduction to software engineering and practice. Topics include software process models, project management, requirements analysis, software quality assurance, and testing. **(Will replace CSE 439)** Prerequisite: Major standing in IT/CSE.

CIT 345   Database Design and Implementation   (4 Cr) EXISTING-MODIFIED
Introduction to the design and implementation of database systems. Topics include designing a practical database for an application using normal forms, understanding relational database schemas, planning and implementing a database using software such as Oracle and Microsoft SQL Server, advanced database topics in redundancy, replication, load balancing, compatibility, ODBC and JDBC, and database systems administration. Students will use Oracle or Microsoft SQL Server in laboratory applications. **(Will replace CSE 445)** Prerequisite: Major standing in IT/CSE.

CIT 346   System Administration and Security   (4 Cr)   NEW
This course surveys the tools and techniques for administering computing systems. Topics include system installation, file systems and directory permission structures, print and disk quotas, device configuration and management, client administration, remote access and remote administration, and security. The course has a significant lab component. Prerequisite: Major standing in IT.

CIT 350   Human Computer Interaction   (4 Cr)   NEW
This course surveys the various components and techniques of Human Computer Interaction (HCI). Topics include the basic perceptual, cognitive, and performance capabilities of people and external factors that affect these capabilities, tools and techniques for understanding, predicting, and evaluating the interactions of people with technology. The systematic processes for designing, evaluating, and revising interactive systems are studied and practiced in homework assignments and class projects. Prerequisite: Major standing in IT

CIT 352   Systems Analysis   (4 Cr)   EXISTING
Theory and practice of designing information systems to meet users needs. Topics include information systems development life cycle, methodologies for requirement analysis, tools for system analysis, rapid prototyping, and analyzing and designing system interfaces. Prerequisite: Major standing in IT. **(Cross-listed with MIS 316)**

CIT 402   Professional Practice   (2 Cr) EXISTING-MODIFIED
Seminars on software piracy, hacking, privacy, professional conduct, and the impact of information technology on society. Prerequisite: Senior standing in IT.

CIT 450   IT Project Management   (4 Cr)   NEW
This course presents the theory and practice of IT project management. Topics include financial modeling, cost and effort estimation, project risk management, and project evaluation and selection as well as topics in IT project sponsorship, stewardship, and leadership. IT entrepreneurship and marketing are emphasized throughout the course.
Prerequisite: Major standing in IT. **(Cross-listed with MIS 450)**

CIT 480   Senior Capstone Project   (4 Cr) EXISTING-MODIFIED
An individual or a team-oriented senior project to synthesize the knowledge and skills gained in the IT curricula. Written and oral reports are required in addition to a working demo. **(Cross-listed with CSE 480)** Prerequisite: Senior standing in IT.

CIT 494-I   Internship   (4 Cr)   EXISTING-MODIFIED
The student works on a specific project at a corporate site with the prior approval by the program director. Oral and written presentations about the project are required. Prerequisite: Major standing in IT.

CIT 494-E   Industrial Project   (4 Cr) EXISTING-MODIFIED
The student works on an industry sponsored project in the department. Oral and written presentations about the project are required. Prerequisite: Major standing in IT.

CIT 494-R   Undergraduate Research   (4 Cr) EXISTING-MODIFIED
The student performs research under the supervision of a faculty member. Prior permission required. Oral and written presentations about the research are required. Prerequisite: Major standing in IT.

CSE 461   Bioinformatics   (4 Cr) New
This course covers the fundamental algorithms and computational methods for study of biological sequence data for comparative biology and evolution with the focus on discovery of genome content, function and organization. Specific methodologies covered include the algorithms for searching sequence databases, pair-wise and multiple sequence alignment, phylogenetic methods, and methods for pattern recognition and functional inference from sequence data. Prerequisite: Major standing in CS/IT

APM 163 Mathematics for Information Technology   (4 Cr) New
Systems of linear equations, matrix algebra and linear transformation. Elementary combinatorics, recursion and induction, sets and relations. Prerequisite: MTH 122 with at least a 3.0 or MTH 154. Enrollment is limited to students in the B.Sc. IT program. APM 163 cannot be used to replace APM 263 or MTH 256.

Appendix C

Faculty Vitae

Please visit the CSE Department homepage at http://www.cse.secs.oakland.edu for teaching and research interests of the faculty and links to their homepages.

PLAN OF STUDY

INFORMATION TECHNOLOGY

STUDENT_____

STUDENT NUMBER_____ DATE_____

ENTERED: OU_____ SECS_____

FACULTY ADVISER_____ CATALOG(S) _____

* CLASSES REQUIRED FOR MAJOR STANDING

	REQUIREMENTS		CR	GRADE	TR	TR. FROM	SEMESTER or SESSION		REMARKS
GENERAL EDUCATION **(24 CRS)**	ARTS	(h)							
	LITERATURE	(f)							
	LANG+CULT	(k)							
	WEST. CIV.	(l)							
	GLOB.PROS	(i)							
	SOC. SCI.	(b)							
	DIVER. REQ	(g)							

MATH SCIENCE **(20 CRS)**	MTH 154*or MTH 122*(d)								
	APM 163 *								
	STA 226 *								
	SCIENCE ELEC. * (a) [Satisfies Gen Ed Science]								
	SCIENCE ELEC. * (e)								

CIT CORE	CIT 130 *							
	CIT 220 *							
	CIT 230 *							
	CIT 247							
(20 CRS)	CIT 251							

CIT	CIT 222							
	CIT 248							
	CIT 345							
CONCEN-	CIT 350							
TRATION	CIT 352							
	CIT 280							
	CIT 337							
(32 CRS)	CIT 402							
	CIT 480 **(j)** (m)							

1) CHOOSE ONE: IT 494-I, IT 494-E, IT 494-R   ONE: CIT 494-I, C IT 494-E, C IT 494-R

CIT TRACKS	1)							
	2)							
(12 CRS)	3)							

MGMT. & COMM.								
COURSES								
(8 CRS)								

FREE ELECTIVES (8 CRS)	**RHT 150 ***							
	RHT 160 * (c)							

TOTAL:	**CREDITS**							

a) **Natural Science & Technology**

b) **Social Science**

c) **Rhetoric Writing**

d) **Formal Reasoning**

e) **Knowledge Applications**

f) **Literature**

g) **Diversity**

h) **Arts**

i) **Global Perspectives**

j) **Capstone Experience**

k) **Foreign Language & Culture**

l) **Western Civilization**

m) **Writing Intensive**

MEMORANDUM

TO: Ishwar K. Sethi, Chair
                Department of Computer Science and Engineering

FROM: Robert S. Slater
                Librarian Liaison to Engineering and Computer Science
                 and
                Mildred H. Merz
                Coordinator for Collection Development
                Kresge Library

SUBJECT: Collection Evaluation for Proposed Bachelor of Science in
                Information Technology

DATE: April 15, 2004

To determine the library's readiness to support the proposed Bachelor of Science in Information Technology we consulted the fall 2003 proposal for the program, carefully reviewed the courses being required in the program (especially those not previously offered), researched likely book and journal needs for these courses, and compared these needs to the library's holdings.

8. Collection Strengths

The library has electronic access to all of the basic periodical indexes that IT majors would most likely need to discover journal articles relevant to their coursework. We have *Applied Science and Technology Abstracts* (as a FirstSearch database), *Science Citation Index* (through the Web of Science interface), and *Engineering Index* (via the Engineering Village interface). *ASTA* is the most basic of the three indexes, and students will find that most of the journals indexed there are either available online or as print journals in the library. The library also has online subscriptions to two very important groups of journals. From the Association for Computing Machinery we have the *ACM Digital Library* which not only includes ACM's journals and magazines, but also its proceedings and newsletters. In addition the site is searchable by topic making it possible both to easily discover citations to appropriate materials and also to be able to view the full text of each item. We also subscribe to the electronic "All Society Periodical Package" from the Institute of Electrical and Electronics Engineers with online fulltext articles from these IEEE journals and transactions since 1998. We were also able to add several relevant online subscriptions from Kluwer through a cooperative arrangement among several other Michigan universities. Especially relevant titles in this collection include <u>Information Retrieval</u>, <u>Journal of Intelligent Information Systems</u>, and <u>Multimedia Tools and Applications</u>.

9. Collection Needs

Although we do have access to many journals important to this program, there are still some important ones we lack. See Appendix A. Since *Applied Science and Technology Abstracts* is an index suitable for undergraduate use, the titles we lack that it indexes would be especially appropriate to add. For new subscriptions we have budgeted $2500 for year one and are suggesting that all journals selected for addition be available as online subscriptions.

In addition to some modest increases for additional periodical subscriptions, this particular program has major book needs. Students already request reference handbooks dealing with programming, object oriented computing, database design, etc. We have tried to purchase a few works, but it has been difficult both to anticipate student needs and to maintain an up-to-date collection. In addition, these are the types of books we hesitate to buy because they often "disappear." When reviewing the library needs for this program, we decided that the best way to meet students' needs (and not to lose books) would be to obtain needed titles electronically. Safari Tech Books Online allows libraries to lease individually selected titles from the two IT publishers that publish more than half the IT books available, O'Reilly & Associates and The Pearson Technology Group (with imprints from Addison Wesley, Prentice Hall, Que, Cisco Press, etc.). A library can lease a collection of 100 books or more and select the number of simultaneous users for which it wants to pay. The titles in the collection can vary month-by-month thus allowing a library to tailor the collection according to use information and current courses. While this plan cannot furnish all the book needs for the program, we do believe it would be a good step in providing the students with the latest in technical ready-reference titles. We would plan to work closely with faculty in the program to be sure the most useful titles are selected. Universities in the state with Safari e-books include Michigan State, Wayne State, and Lawrence Tech. Cost for 100 books with two users is $3352 per year.

Although Safari would meet most book needs of students, some needed titles may either not be available through Safari or might be wanted in print. We have budgeted a small amount ($500 per year) for "traditional" books.

We think that the modest library funding that we propose for this program will provide students with the basics that they need without necessitating their use of other libraries, a reasonable goal for every undergraduate program.

cc: Julie Voelck, Interim Dean of the Library
Susan Awbrey, Chair of University Committee on Undergraduate Instruction

Appendix A
Relevant Journals Not Accessible at OU

Data and Knowledge Management		$ 1,353
Dr. Dobbs	ASTA	$ 35
Information and Software Technology	ASTA	$ 832
Information Processing and Management		$ 1,076
International Journal of Computer Applications in Technology	ASTA	$ 885
Journal of Information Science		$ 398
Multimedia Systems	ASTA	$ 500
F. Totals		**$ 5,079**

ASTA: Applied Science and Technology Abstracts. Four titles with this designation are indexed in *ASTA*.

Prices above are for online versions of the journals whenever possible.

Five Year Library Costs to Support Undergraduate Major in
Information Technology

	Year 1	Year 2	Year 3	Year 4	Year 5
E-Books*	$3,400	$3,600	$3,800	$4,000	$4,200
Books**	$ 500	$ 525	$ 550	$ 575	$ 600
Journals***	$2,500	$2,750	$3,025	$3,330	$3,700
a Totals	$6,400	$6,875	$7,375	$7,905	$8,500

*This presumes 5% per year inflation for books. This will allow the Library to lease 100 books, to have two users at any time, and to swap titles as often as once a month.
**This also presumes 5% inflation. This will be funding to purchase 8 to 10 "traditional" books per year.
***This presumes 10% per year inflation for journals. Number of journals will be dependent on price of those selected.

OAKLAND UNIVERSITY
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MEMORANDUM

October 6, 2003

TO: Dr. Susan M. Awbrey
         Vice Provost for Undergraduate Education

FROM: Bhushan L. Bhatt, Associate Dean
         School of Engineering and Computer Science

SUBJECT: **B. S. Program in Information Technology**

The request from the Department of Computer Science and Engineering for a
B. S. program in Information Technology was properly reviewed and approved by
the SECS Undergraduate Curriculum Committee. It was subsequently
considered by the Executive Committee on April 10, 2003 and approved for
presentation as a motion to the SECS Assembly. The SECS Assembly took up
the motion, for a first reading, in its meeting on April 21, 2003. The final proposal
for consideration, a second reading, came up in the Assembly meeting of
September 5, 2003. Subsequently, a motion to approve initiation of a B. S.
program in Information Technology was unanimously approved by the Assembly
on September 5, 2003.

I hope this is helpful in future deliberations. If you have any questions, Please
feel free to contact me. Thank you.

C: Pieter Frick, Dean, SECS
      Virinder Moudgil, Vice President for Academic Affairs and Provost
      Ishwar Sethi, Chair, Computer Science and Engineering