

Program Review

Computer Science

**College of Information Technology and
Engineering**

November 2010



MARSHALL UNIVERSITY

Program Review Marshall University

Date: 14-Oct-2010

Program: Bachelor of Science in Computer Science

Date of Last Review: None (new program)

Recommendation

Marshall University is obligated to recommend continuance or discontinuance of a program and to provide a brief rationale for the recommendation.

Recommendation

Code (#):

1. Continuation of the program at the current level of activity; or
2. Continuation of the program at a reduced level of activity or with **corrective action**: Corrective action will apply to programs that have deficiencies that the program itself can address and correct. **Progress report due by November 1 next academic year**; or
3. Continuation of the program with identification of the program for **resource development**: Resource development will apply to already viable programs that require additional resources from the Administration to help achieve their full potential. This designation is considered an investment in a viable program as opposed to addressing issues of a weak program. **Progress report due by November 1 next academic year**; or
4. Development of a cooperative program with another institution, or sharing of courses, facilities, faculty, and the like; or
5. Discontinuation of the program

Rationale for Recommendation: (Deans, please submit the rationale as a separate document. Beyond the College level, any office that disagrees with the previous recommendation must submit a separate rationale and append it to this document with appropriate signature.)

1 Paulus Wahjudi 10/14/2010
 Recommendation: Signature of person preparing the report: Date:

1 William Pierson 10/14/2010
 Recommendation: Signature of Program Chair: Date:

1 Betsy Dulin 10/14/2010
 Recommendation: Signature of Academic Dean: Date:

1 James McIntosh 10/16/2010
 Recommendation: Signature of Chair, Academic Planning Committee: (Baccalaureate pgms only) Date:

1 Camilla Brammer 1/27/2011
 Recommendation: Signature of President, Faculty Senate/ Chair, Graduate Council: Date:

 Recommendation: Signature of the Provost and Senior Vice President for Academic Affairs: Date:

 Recommendation: Signature of the President: Date:

 Recommendation: Signature of Chair, Board of Governors: Date:

10/14/2010

College/School Dean's Recommendation

Recommendation:

Continue the program at the current level of activity.

Rationale:

This Computer Science (CS) program at Marshall University made its debut in Fall, 2004. The CS curriculum is based on national standards set by two professional organizations: ACM and IEEE-CS. All the courses were developed and approved during the 2003 – 2004 academic year. The curriculum was reevaluated by the division during the 2008-2009 after five years of operation. Some changes were made and these changes are effective for 2009-2010 incoming class.

CS faculty and division chair have identified potential candidates to serve on the CS Advisory Committee in Spring, 2010. We are in the process of constituting the advisory committee now.

Since the inception of the program, enrollment in the program has grown steadily over the years.

The CS program is attracting students of higher caliber as the program matured. Incoming freshmen have a mean high school GPA between 2.4 and 3.5 and a mean ACT score between 24 and 26.1. The mean ACT score for the past three years have been higher than the mean scores for the first two years. The mean GPA of CS graduates has varied between 3.13 and 3.24.

The CS students run a local chapter of ACM (a professional organization) at Marshall University. This chapter gives students opportunities for professional development. The local chapter competes every year in an international event called ACM-ICPC International Collegiate Programming Contest.

One area of concern for the program is the availability of modern laboratory and classroom space, and adequate office space for the faculty. Program labs and classrooms are primarily located in various rooms in Gullickson Hall. Some of the space was remodeled approximately ten to twelve years ago, but is rapidly becoming out-of-date. Program faculty share a very crowded office suite in the corner of the second floor of Gullickson Hall.

Overall, the faculty feel that the CS program is operating productively. It is preparing students well for jobs in industry as well as for graduate study.

Betsy Dulin

Signature of the Dean

10/15/2010

Date

10/14/2010

Marshall University Program Review

For purposes of program review, the academic year will begin in summer and end in spring.

Program: Computer Science

College: College of Information Technology and Engineering

Date of Last Review: None (new program)

I CONSISTENCY WITH UNIVERSITY MISSION

The Computer Science program strives for excellence in creating, applying and imparting knowledge towards student advancement through intellectually challenging curriculum, scholarly research and publications in collaboration with industry and government for the advancement of computing sciences and service to the university, community, and the profession.

The program's teaching mission realizes the need of human capital in the rapidly changing technology in the field and aims to imbue graduates with strong problem solving expertise, astute critical thinking, technical proficiency, ethical decision making and effective communication skills as individuals, as members of multidisciplinary teams, and ultimately as team leaders with an awareness of the cultural, social, legal and ethical issues inherent in the discipline of computer science.

The pursuit of scholarly research, publications and scholarship in computer science from both faculty and students is integral to create a balanced and well rounded individual with mastery of the fundamentals and practical skills that will continuously pursue the creation of scientific knowledge and practical technology as part of lifelong learning.

The program recognizes the responsibility to support the discipline, the university and society through faculty contribution in professional organizations, sponsorship of student organizations and participation in various service-learning projects and activities.

In support of Marshall University's mission:

The computer science program recognizes the importance of reflecting Marshall University's mission in the courses and in student development. The program entails a maximum and thorough development of each student's potential in Computer Science through various educational innovations and programs that utilize knowledge, creativity and critical thinking skills through various activities in and out of the classroom. Computer Science students are given ample opportunities to be involved in software development projects, research projects, and/or internships as part of their learning experience. The program is also committed on advancing educational innovations that will expand and elevate intellectual resources of the state and region through an assortment of activities and extensive course offerings.

Computer Science faculty have remained current in their field through extensive participation in research projects, prolific scholarly activities and various appointments as professional consultants. The faculties have constantly engaged students' critical thinking, problem solving and adaptive skills through curriculum and course adjustment throughout the academic year.

II ACCREDITATION INFORMATION

The Computer Science degree program is not accredited.

III PROGRAM STATEMENT on Adequacy, Viability, Necessity and Consistency with University/College Mission

A. ADEQUACY

1. Curriculum

There are five components of the curriculum for the BS in CS degree program. The first is a set of courses that covers the core areas of Computer Science. These core areas are programming and programming languages (four courses: CS110, CS120, CS210, and CS300), technical areas of computer science (five courses: CS320, CS330, CS340, CS350, and ENGR212), and the design and implementation of complex computer systems (CS305, CS310, CS490, and CS491). Two electives are also required in the areas of Computer Graphics, Parallel Computing, and Artificial Intelligence. These courses provide the core and applied domain knowledge and application of this knowledge in solving real-world problems using computers and software.

The second is a strong Mathematics requirement that covers topics that are particularly useful in the field of computer science: calculus (MTH229, MTH230), linear algebra (MTH329), probability and statistics (MTH345), and discrete mathematics (MTH220). Since mathematics is the language of computer science, knowledge gained from these courses prepare students well in systematically analyzing and solving problems.

The third area consists of three courses in the field of Business that cover the principles of management (MGT 320 – Principles of Management I), accounting (ACC 215 – Principles of Accounting I), and project accounting (ENGR 221 – Engineering Economy). Knowledge of this area helps students to understand the macro aspects of software engineering, project planning, and cost-benefit analysis.

The fourth area consists of three lab-based science courses that provide students with an understanding of the basic sciences and experience in lab work and lab reports. The lab component is to train students in the procedures for gathering and analyzing scientific data. This is useful for debugging, algorithm analysis, etc. and for scientific computing.

The fifth component of the curriculum during this review is the standard Marshall Plan core curriculum. This will change with the new Marshall core curriculum plan.

Taken together, these courses provide our students with a strong foundation that prepares them for jobs in industry, science and academia, or graduate school.

2. Faculty

The CS faculty are highly dedicated and focused in their role as educators. All of them are student oriented and have an extensive experience in either industry or research. The faculty currently consists of three full-time professors and one adjunct professor. All of the faculty hold advanced degrees and half of them have PhD's in Computer Science. Full time faculty as of Spring 2010 include:

Faculty Member	Rank	Tenure Information
Mr. J. Joseph Fuller, M. S.	Assoc. Professor	
Dr. Venkat Gudivada	Professor	Tenured
Mr. Jonathan Thompson, M. S.	Adjunct Faculty	
Dr. Paulus Wahjudi	Asst. Professor	Tenure-track

Professor Fuller has extensive experience as a consultant with SIS Systems of Durham, NC. Dr. Gudivada worked in financial services industry (Wall Street) for over six years. Also, he has over 18 years of academic and research experience in academia. Professor Thompson worked for the Digital Equipment Corporation for more than 25 years and has consulted for several years with the Army Corps of Engineers, the National Institute for Chemical Studies, and the West Virginia Department of Health and Human Resources. Dr. Wahjudi worked in various capacities with several local, state and federal agencies such as National Geospatial-Intelligence Agency (NGA), Mississippi Forrest County Youth Court, and the Center of Higher Learning at John C. Stennis Space Center.

Faculty grants and awards during this reporting period have included:

P. I./Co-PI/Participant	Project Title	\$ Amount
Mr. J. Joseph Fuller, M. S.	Robot	202,805
Dr. Venkat Gudivada	Imaging Lab	47,200
Dr. Venkat Gudivada	Finding Needle in a Haystack (Summer Camp)	4,800
Dr. Venkat Gudivada (with others at Marshall)	CI-TRAIN	1,100,000
Dr. Paulus Wahjudi	Computing Technology Farm	5,000

There are no Graduate Assistants assigned to the CS program.

3. Students

a. Entrance Standards

Minimum requirements for admission into the Computer Science major for first-time freshmen are:

- An ACT composite score of 21 (SAT 980) and
- An ACT mathematics score of 24 (MTH SAT 560)

Minimum requirements for admission into the Computer Science major for transfer students, whether from within Marshall University or from another institution, are:

- 15 earned semester credit hours of college-level coursework,
- an overall Grade Point Average of at least 2.0 in all college-level coursework,
- completion of ENG 101 (or equivalent) with a grade of C, and
- completion of MTH 132, or MTH 127/130 and MTH 132 (or equivalent) with a grade of C

For those desiring to major in computer sciences who do not meet the admission or transfer criteria listed above may be admitted as Pre-Computer Science majors with a minimum ACT composite of 19 (SAT 900) and an ACT mathematics score of 19-23 (SAT 460-550) Transfer students must be eligible for MTH 127/130 and MTH 132.

b. Entrance Abilities

As shown in Appendix III, incoming freshmen have a mean high school GPA between 2.4 and 3.5 and a mean ACT score between 24 and 26.1. The mean ACT scores for the past three years have been higher than the scores for the first two years, indicating that the program has been able to attract students of higher caliber.

The mean high school GPA for Pre-Computer Science students has varied between 2.62 and 3.30. Their mean ACT scores have been between 19.7 and 24.

c. Exit Abilities

The mean GPA of our graduates, shown in Appendix IV, has been between 3.13 and 3.24.

4. Resources

a. Financial

The average State financial support over a five year period for the Weisberg Division of Engineering and Computer Science is \$233,550, with approximately 32% annually going towards personnel (Student assistants, Part-Time Faculty, etc.).

If this program were terminated as a major, two tenure-track faculty positions and one term faculty position would be lost. Several of the faculty work on grants and contracts which positively impact the region and the loss of that expertise would negatively impact the region and the university's research capabilities. In addition, the loss of the program would also impact students in other majors who are minoring in Computer Science and taking Computer Science courses to complete needed requirements for their College. Computer Science students have participated annually in the Governor's Summer Internship program which has supported the State government and also provided valuable experience for the students. The loss of this program would also impact local

business, such as Strictly Business, which employs several current students and former graduates. There is one administrative support position for the Weisberg Division of Engineering and Computer Science, so the workload would be less but the position would still be needed to support engineering and the two graduate programs also in the division.

There are several scholarships available for Computer Science students:

- **Kalayci Family Scholarship:** Due to the generosity of Tanzer Kalayci, P.E. (BES, '62), undergraduate engineering and computer science students now have additional opportunities to earn financial assistance during their sophomore, junior and senior years of study.
The scholarship is available to full-time undergraduate students in CITE who have completed the freshman year. Recipients of the scholarship, to be selected by the Dean upon recommendation from the Division Chair, must be residents of Cabell, Lincoln, Mason or Wayne counties, and have a minimum GPA of 2.5. Awards are renewable for up to three years (or six semesters), provided that the recipients maintain good academic standing.
- **Wellman Family Foundation Scholarship:** Students who are residents of West Virginia with financial need (or any student with financial need who lost a parent in the 9/11 World Trade Center or Pentagon attacks) and who have a minimum GPA of 3.0 are eligible to apply for this scholarship. First priority for scholarship awards is given to students majoring in the field of Computer Science. The scholarship was established in 2002 by F. Selby Wellman who earned his B.S. degree in finance from Marshall's College of Business in 1963. He spent over 30 years in high-tech industry before retiring as a senior vice president at Cisco Systems, Inc.
- **Hollings Undergraduate Scholarship Program:** Sophomore students majoring in disciplines related to oceanic and atmospheric science, research, technology, or education, and supportive of the purposes of NOAA's programs and mission (e.g., biological, social and physical sciences; mathematics; engineering; computer and information sciences; and teacher education) are encouraged to apply for a scholarship from the National Oceanic and Atmospheric Administration (NOAA) Ernest F. Hollings scholarship program. Student must have official Junior status in the fall semester.

b. Facilities

Classrooms

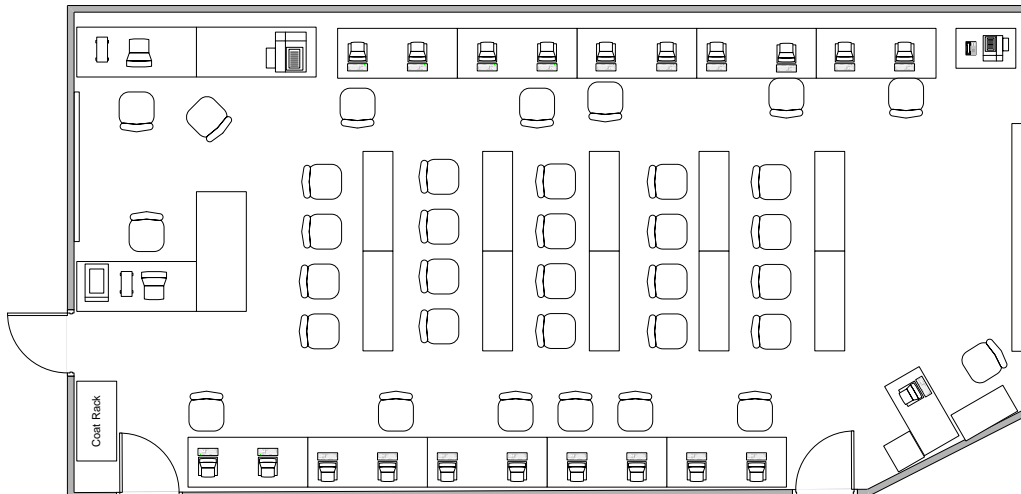
There are two dedicated classrooms that are set up in a lecture/lab format with lecture seating in the center of the room and lab machines against three of the four walls. This layout enables the students to concentrate on the material being presented during the lectures without distraction, and to use the computer workstations during the lab portion of the class

The software installed in the labs includes:

- Java Development Kit v6
- BlueJ, NetBeans and Eclipse IDE
- Android Standard Development Kit
- MATLAB including 25 licenses for the Imaging Toolbox and ten licenses each for the Fuzzy Logic and Neural Network toolboxes
- SAS Business Analytics software
- OpenCV and ImageJ
- Visual Studio with Visual Basic and C++
- Microsoft Office suite including Excel, Word, PowerPoint, Project, and Visio
- Oracle 10g Client
- Microsoft SQL Server
- MySQL Client and Server
- VMWare Workstation

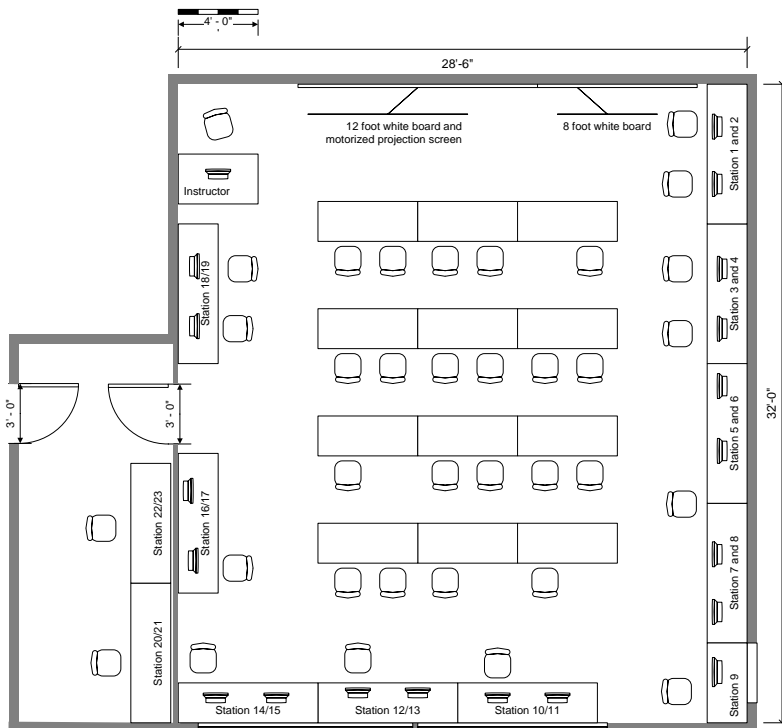
Gullickson Hall Room 206A

This room includes 20 student systems, seating at tables for 20 students, one instructor system with a visual presenter, a touch screen display, a standard display, and speakers, and two ceiling-mounted projectors and projection screens that allow the instructor to simultaneously display two different content items.



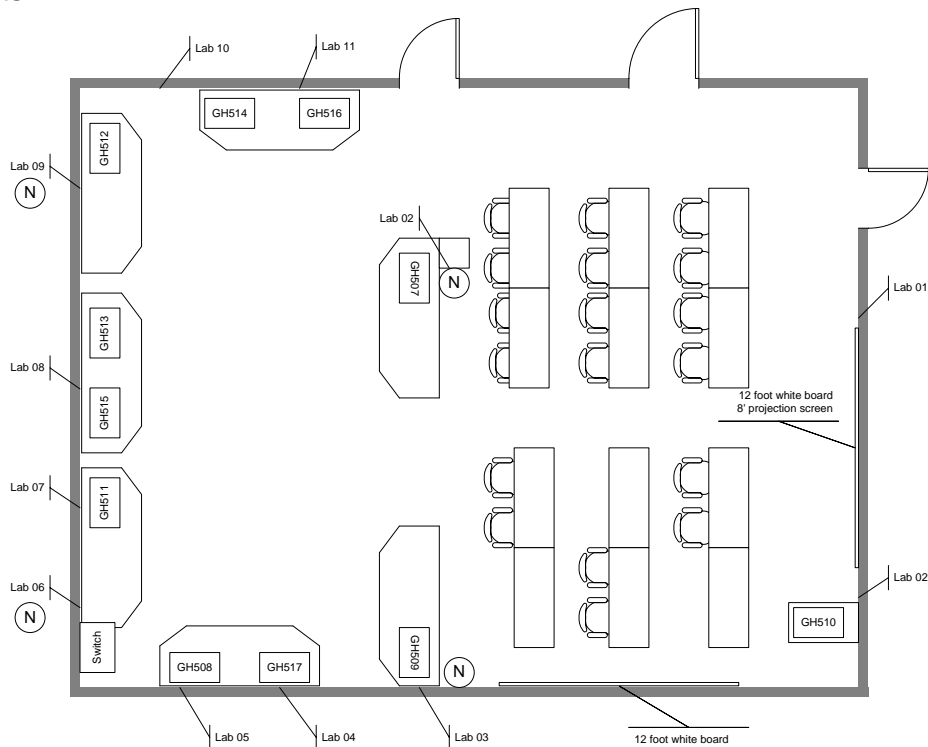
Gullickson Hall Room 211

This room has 23 student systems, seating at tables for 24 students, one instructor system with a visual presenter, a touch screen display, a standard display, and speakers, and two ceiling-mounted projectors and projection screens that allow the instructor to simultaneously display two different content items.



Gullickson Hall Room 5 Classroom

This room has 12 student systems, one instructor system with a visual presenter, DVD/VCR player, speakers, and a touch-screen monitor. It also has one ceiling-mount projector, a white-board and projection screen, and seating at tables for 24 students.

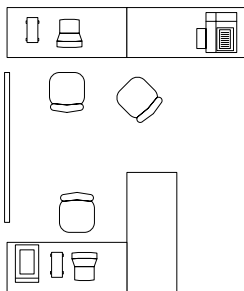


Labs

There are no dedicated labs however there is space available in GH206A for lab use.

Imaging Lab

This is located in the back of GH206A and consists of two Dell Precision workstations and a color printer.



Networking Lab

This is also located in the back of GH206A and consists of two workstations. Each workstation is composed of four blade servers, four CISCO routers, four switches, and one keyboard, monitor, and mouse. The workstations are on wheels so that they can be moved as necessary.

Visualization Lab

We are able to make use of the facilities in the Visualization lab which include a large LCD ten by eight foot LCD, a server, and a movement simulator that translates real-time motion by an individual into the motion of an avatar on the large format LCD display.

Computational Research and Education for New and Emerging Technologies

CoRE-NET is an undergraduate research group designed to promote scholarly achievement and works closely with the ACM Student Chapter. CoRE-NET houses the Computing Technology Farm (CTF) that provides various computing resources for student projects in and out of the classroom. Among the current projects is the development of a cluster, display wall, a Cybersecurity network farm and a Cube interactive VR display system along with the research and development of various software systems in Human Computer Interface and Intelligent Systems.

Server Room

There is a make-shift server room in GH206C that houses six blade servers for image processing, an Oracle database server, a second database server running MySQL and Microsoft SQL Server, a server devoted to geographical information systems (ARCgis), one file server for course work, and one file server for administrative use. There are three battery-backup Uninterrupted Power Supplies. The file servers are backed up to external USB drives on a weekly basis. There is a window-mount air conditioning unit to maintain the temperature at 70°F.

Student Areas

The ante-rooms in the GH205 and GH207 suite of offices each contain two Dell OptiPlex 780 systems. GH205 also has a CS library with over 150 computer-related texts.

Software

The CS program maintains active memberships in the Oracle Academic Initiative, the Microsoft Academic Alliance, and the VMware academic program. These three programs enable us to distribute proprietary software to our students for a nominal annual fee. This allows them to use state-of-the-art software for their courses and projects. In addition, the program relies on open-source software (such as MySQL, OpenOffice, LaTeX, OpenCV, ImageJ, Tomcat, Java, NetBeans, BlueJ, and Python, among other titles) that provides our students with capable software that is used by industry and academia with no cost.

Other Equipment

The department has two digital cameras, a digital video recorder, and two digital cameras with TCP/IP interfaces for use by students in their various projects. Additional equipment includes hand-held GIS-capable personal digital computers, two programmable Android phones, and two programmable Motorola phones. These latter devices are used in our Special Topics courses devoted to current trends in computing.

5. Assessment Information:

a. Summary Information (see Appendix V for details)

The computer science program tailored each course to provide students the skills and knowledge necessary to be an effective and efficient computer scientist. Each student is expected to acquire the theoretical concept and technical knowledge to devise and implement a practical solution to various computer science concepts at the end of every course in accordance to the curriculum defined by Association for Computing Machinery.

Assessment of the individual course and the program as a whole features a variety of assessment tools such as exams, in class quizzes, lab assignments, and group programming projects along with project presentations and question-answer sessions. The utilization of co-teaching in the early CS courses allows each instructor to assess student performance during lab sessions and also to assess fellow instructors in delivery of course materials. Each course will then be discussed in program meetings among fellow CS faculty, offering input and constructive criticism to refine the courses.

The dynamic and constantly changing field of computer science creates a challenge in establishing a standard in upper level courses. The program adheres to the standard established by ABET accreditation for computing in preparation for ABET accreditation in the coming future. The CS program is currently investigating the possibility of incorporating the Major Field Achievement Test (MFAT) in Computer Science as a required component in the CS 490: Senior Project class in the fall semester of the student's senior year. MFAT will provide a measure of computer science knowledge at Marshall in comparison to other CS students across the country. The confidential data obtained will be used as reference in revising various courses.

In general, the CS program is up to par in offering the standard CS program in the nation which is evident in students' performance in events such as the ACM programming competition and employer satisfaction. The program does have several limitations due to lack of space which lead to limited support for equipment and research activity. These drawbacks provide considerable limitations to the program's ability to offer various computer science elective courses that are relevant to the current state of the technology.

The computer science program is constantly evolving to address the demands of the technology. The program will revise each course in accordance to the development of technology in the field while providing the necessary hardware and software support required in the course. Each course will receive minor revision every semester and sometimes the course will receive major revisions that are in accordance to adjustment in the entire curriculum.

b. Other Learning and Service Activities

CS faculty and students are involved with various activities beyond the regular classroom. Every year, several CS students form teams and compete in the ACM International Collegiate Programming Competition (ICPC) held at University of Kentucky as part of the Mid Central region. The competition is a five hours long programming event between teams from various universities, where each team consisting of three students will be given a set of problems and will be required to provide the computational solution. Team rankings are determined on the number of problems solved and through the coaching by the CS faculty. Marshall's teams have competitively solved problems greater than or equal to the regional average.

The Marshall ACM Student Chapter has various events planned throughout the semester to provide a fun learning experience beyond the classroom and to build camaraderie in the student body. The chapter recently started a service oriented activity in the form Linux Installfest event that provide free setup and installation of Linux to any PC or Notebook owned by a Marshall student.

CS faculty are involved in various activities such as the Exploring Engineering: Academy of Excellence where a new CS oriented event called "Cyber Detective" provides camp participants an overview of various CS topics through fun and challenging assignments. A CS oriented summer camp titled "Finding Needle in a Haystack" was offered to high school students from various locations to introduce them to computer science as part of recruitment effort. CS faculty have also collaborated with the Mathematics department in Fall 2009 through the offering of "Calculus Rescue class" which is pilot program sponsored by NASA with the focus on providing strong foundation for students who have performed poorly in calculus. The computer science program recently established the Computing Technology Farm (CTF), funded through the Hedrick Teaching Grant, a pilot program that focuses on creating innovative and creative activities for computer science students that will augment the curriculum. CTF started in Fall 2010, but has received significant interest from students. Through this program, faculty are actively working with students to develop quality undergraduate research projects.

c. Plans for Program Improvement

Forty-five Dell Optiplex 780 systems will be ordered and installed in the Gullickson Hall labs in rooms 206A and GH211 during the summer of 2010. These systems will include CUDA-compliant nVidia graphics cards, twenty-two inch widescreen monitors, and 4GB of main memory.

A special topics course on Current Topics in Computer Science will be offered in the fall of 2010. This will be instituted as a standard course beginning the fall 2013.

The Cyber Security course CS 340 will be revamped to provide students with a higher degree of hands on exercises and assignments that reflects the dynamic and constant

change in the field of Cyber Security. This modified course will be offered in Spring 2011.

Beginning in the Fall of 2012, CS305 and CS310 will be consolidated into a single CS305 offering and the remaining topics will be distributed across CS110 – Computer Science I, CS120 – Computer Science II, and CS210 – Algorithm Analysis and Design.

Beginning in Spring of 2013, a new course in Automata Theory will be offered.

Beginning in the Spring of 2012, a required course in Advanced Algorithm Analysis and Design will be offered. This class will alleviate the load from the current Algorithm and Data structures class allowing faculty members to cover materials in more depth and dedicate more class time for a given algorithm.

These changes are being made despite the net increase in the teaching load of the Computer Science faculty because of the program's desire to offer a quality product to our students.

d. Graduate and Employer Satisfaction

Appendix VIII contains an unsolicited e-mail from an employer of one of our graduates. As the reviewers can see by the letter, this employer is very impressed and pleased with our graduate.

e. Attach the previous five years of evaluations of your annual assessment reports

6. Previous Reviews

There was a Computer Science Program Review in 2006. This review recommended that the program continue at its current level of activity. The three weaknesses identified in that review and the status of those weaknesses are as follows:

- **Weakness:** Lack of resources for faculty development in a discipline with technology that changes weekly.
Status: Faculty development resources available to CS faculty are similar to those available to engineering faculty, who are members of the same division. While faculty development funds are limited across the campus, during the past five years, no request from CS faculty has been denied for funds to support development.
- **Weakness:** Faculty need reduced teaching loads to engage in research and scholarly activities – need to add faculty to the program.
Status: There has been no change in the number of full-time faculty positions in the program while the teaching load has increased. However, the CITE Dean has requested that faculty positions currently assigned to the MS IS program be reallocated to the CS program as those IS positions become vacant.
- **Weakness:** Lack of infrastructure – need more classrooms, labs, and faculty offices as we will be offering more junior- and senior-level courses in the upcoming years.
Status: There has been no change in the availability of classrooms, labs, and faculty offices.

7. Strengths/Weaknesses

The strengths of the program are multifold. They include:

- Team teaching the first three Computer Science courses: We have two professors instructing the students in these courses. We have a lecture/lab format in which we lecture for the first twenty minutes or so of the course and then have the students perform a lab exercise for the other thirty minutes of class time. The lab exercise reinforces the material presented in the lecture portion of the class. By having two professors, we are able to have adequate resources available to answer student questions during the class period. We have discovered that if we lecture for the entire period with an outside lab assignment, then there is no knowledgeable person available to answer any questions that may arise during the lab assignment. By having the professors in class, the students can get answers to their questions. While they may not be able to finish the lab during the class period, they are usually able to get enough information so that they can complete the lab outside of class. This regime is not continued beyond the first three semesters. By then, we expect students to be able to work with each other to solve problems.
- Focus on team-work: In the core technical courses (CS320 and CS330 for example), considerable reliance is placed on students working in teams to solve programming problems or homework problems. Communication among classmates is encouraged, especially in homework assignments in these courses, as there is no better way to learn material than to be asked to explain it to another student.
- Increasing number of internships that are available to students: In the first three years of the program, there were only three internships available. These have steadily increased through the years.

Internships – Summer 2005

2 – ChannelNet, Detroit, MI

Internships – Summer 2006

1 - ChannelNet, Oakland, CA

Internships – Summer 2007 through Spring 2008

1 – Biology Dept, Marshall University

3 – Spatial Integrated Systems

1 – Strictly Business, Huntington, WV

2 – College of Information Technology and Engineering

Internships – Summer 2008 through Spring 2009

3 – American Foundation for the Blind, Huntington, WV

2 – Virtual Reality Lab, Marshall University

1 – Biology Dept, Marshall University

3 – Spatial Integrated Systems

1 – Electronic Data Systems

2 – College of Information Technology and Engineering

1 – Strictly Business, Huntington, WV

1 – Instructional TV Systems

Internships – Summer 2009 through Spring 2010

1 – NASA

1 – MSHA

- Faculty accessibility: All faculty members leave their doors open throughout the day (even during non-office hours) to encourage students to come in and ask questions or chat with faculty members. The open environment in the faculty office areas increases interaction between student and faculty, student with fellow student and among faculty.
- Emphasis on face-to-face teaching experience as opposed to online or remote classrooms. We feel that this is a vital component of the educational experience. There are subtle nuances that the instructor can detect to help respond to student questions or concerns during a lecture that would be lost if the course was taught in an online environment.
- Dynamic curriculum: We are modifying the composition of our elective offerings. This keeps our curriculum up to date and helps to ensure that students are kept abreast in the rapidly changing field of Computer Science.

Weaknesses:

- There are not enough faculty members to meet the demands of the program. We need a minimum of five full-time faculty members instead of three full time and one adjunct member to meet the needs of course preparation, research, and faculty development. As it is, faculty members are hard-pressed to meet the needs of course instruction, let alone participate in faculty development, creation and presentation of papers, participation in conferences, etc. In addition to teaching core CS courses, new faculty would teach courses in the areas of graphics, artificial intelligence, embedded systems, or cyber security.
- As our enrollment continues to increase, we will need more course sections and more professors to teach those sections. For example, twenty students is about the largest class size that can be accommodated in the CS320 – Internetworking and CS330 – Operating Systems courses. As early as the 2011-2012 academic year, we will need to start offering two sections of these courses, not just one, if we are to maintain the current teaching pedagogy that has an emphasis on class interaction, in-class hands-on exercises, and student involvement. If we taught these courses using a traditional lecture format we could accommodate much larger class sizes but the educational experience would be much diluted.
- The lack of facilities continues to be a problem. There is not enough lab space for students to set up and work on a project for a course or for a senior project. There is no facility for a server room with adequate temperature controls and power.
- Security is a problem. Ideally we should be able to give CS students access to facilities after five o'clock so they can complete their assignments outside of class. While the GH206A classroom and its equipment are available Monday through Thursday until 9:00 pm, that is often not long enough for students to complete their work. Ideally, we would have swipe cards issued to students so they can access the equipment 24x7.
- The lack of a steering committee composed of local members of industry and academia. Such a committee could champion the program and provide us with valuable guidance as to the content of the program. Again, the lack of resources has made it difficult to find the time to organize and maintain such a committee.

- The lack of reliable air conditioning in the classrooms and labs continues to be a problem. The server room and the classrooms continue to overheat, which leads to a poor teaching environment that disturbs teaching activity and damage to sensitive computing equipment.
- The program needs a higher graduation rate. The current rate will be improved with the graduating class of 2011 as there are several dual majors and other students who needed five years to complete the degree program who will be graduating in December or in May. A major problem continues to be the mathematics and science requirements. These are critical to the success of our students and cannot be simply waived away. The Calculus Rescue initiative, with the participation of Professor Fuller, has helped in this regard. A more comprehensive program is needed to assist students in remedial mathematical and science needs.
- While the employment rate for our graduates is acceptable, we might be able to do more to ensure employability through the increased use of internships and job search capabilities. Frequently, our graduates are not aware of emerging jobs in the area because they are out of touch with us after they graduate. We need to develop a better communication facility to keep them informed of job opportunities after they have left the area (such as an alumnus email list).
- The program needs to develop a more systematic satisfaction survey to canvas a broader spectrum of the employers of our graduates.

B. VIABILITY

1. Articulation Agreements

The CS program does not have articulation agreements with other institutions.

2. Off-Campus Classes

The CS program does not offer off-campus classes.

3. Online Courses

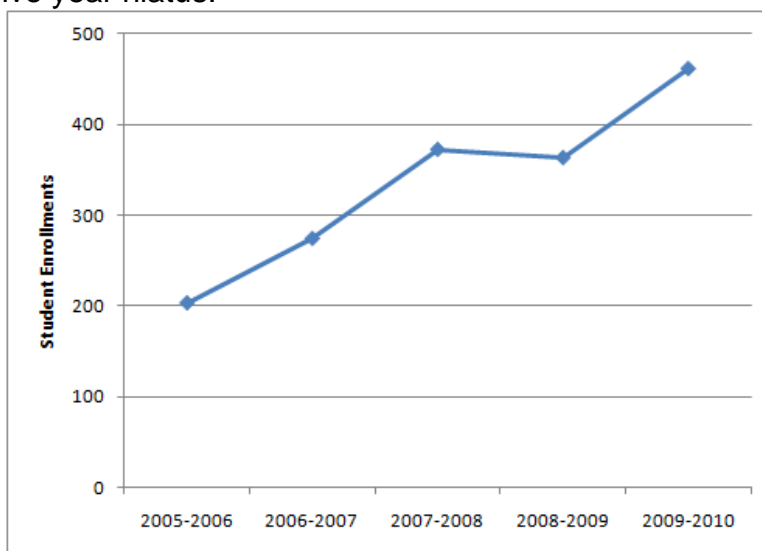
The CS program does not offer online courses.

4. Service Courses

The Computer Science program offers only one course (CS110 – Computer Science I) that is required by majors in other programs (specifically Applied Mathematics).

5. Program Course Enrollment

Student enrollments in the CS program have more than doubled over the five year period of this review, affirming the decision of the Board of Governors to restart the program after a five year hiatus.

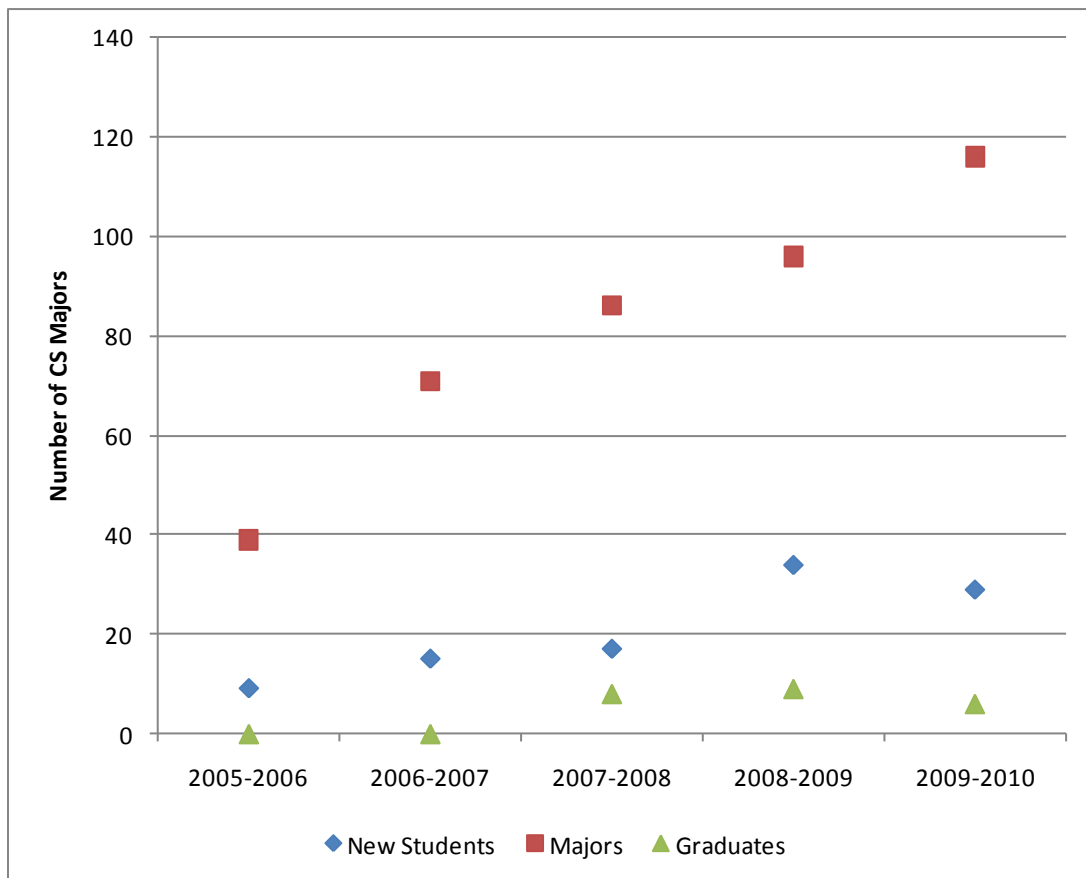


Program Course Enrollment (see Appendix VI)

During this review period, there have been no substantial changes to the set of courses that we offer. We have added elective courses in Parallel Programming and Visual Programming during the last two years to keep abreast of current technology trends. We offer the three introductory courses (CS110 – Computer Science I, CS120 – Computer Science II, and CS210 – Algorithm analysis and design) every semester. With the exception of some advanced electives, the rest of our courses are offered once per year.

6. Program Enrollment

The increase in the number of CS majors has mirrored our increases in course enrollment.



The number of CS majors has tripled in the past five years and the number of incoming freshmen students has generally been increasing from year to year. Not shown in the graph or the data in Appendix VII are the approximately five students per year who transfer into the program from other colleges in Marshall or from other universities (such as West Virginia University or Dennison University).

7. Enrollment Projections

We expect the number of program enrollments to continue to increase at a moderate rate. Factors that would increase our enrollment include improved facilities, an up-turn in the economy, and continued word-of-mouth advertising among our current students and students still in high school. Factors that would decrease our enrollment include the emerging popularity of the game programming area of emphasis in the Integrated Science and Technology program.

The table below shows projected course enrollment over the next five years. The Type column has values of (E)lective, (R)equired, or (S)ervice. There is no column for Summer enrollments as we do not anticipate offering summer CS courses.

Course Nbr	Course Name	Type	2010/2011		2011/2012		2012/2013		2013/2014		2014/2015	
			Fa	Sp	Fa	Sp	Fa	Sp	Fa	Sp	Fa	Sp
CS110	Computer Science I	R+S	62	42	56	16	41	34	66	26	68	38
CS120	Computer Science II	R	24	46	28	40	9	46	7	52	5	36
CS210	Algorithm Analysis and Design	R	20	10	24	12	26	14	28	16	30	18
CS215	Adv. Algorithm Analysis and Design	R				25		27		29		31
CS300	Programming Languages	R		22		24		26		28		30
CS305	Software Engineering I	R	20		24		26		28		30	
CS310	Software Engineering II	R		18		20		22				
CS320	Internetworking	R	20		22		24		26		28	
CS330	Operating Systems	R	20		22		24		26		28	
CS340	Cyber Security	R		20		22		24		26		28
CS350	Database Engineering	R		20		22		24		26		28
CS360	Automata and Formal Languages	R					24		26		28	
CS370	Computer Graphics	E	6		12		7		14		9	
CS425	Computational Intelligence	E		10		12		14		16		18
CS440	Image Processing	E	10		12		14		16		18	
CS480	Special Topics	E	19		22		24		26		28	
CS481	Special Topics	E		11		13		15		17		19
CS490	Senior Project I	R	20		22		24		26		28	
CS491	Senior Project II	R		20		22						

CS225 – Advanced algorithms is a new course that will be offered every spring, starting in 2012.

CS305 – Software Engineering I and CS310 – Software Engineering II will be merged into a single course beginning in 2011. The content of the extra semester will be distributed across CS110, CS120, and CS210 so that Software Engineering principles and practices will be introduced and reinforced earlier in the program.

CS360 – Automata and Formal Languages is a new course that will be offered every fall, beginning in 2012. It is being introduced as a required course to reinforce the theoretical aspects of Computer Science.

CS425 – Computational Intelligence is the new title for the old special topics course Artificial Intelligence.

C. NECESSITY

1. Advisory Committee

The program does not currently have an advisory committee

2. Graduates

For the first two years of the program review period, the CS program did not have any seniors to graduate. In the last three years, 23 students have graduated from the program.

Seventeen of our graduates (74%) are either employed in a field related to Computer Science or are in a Graduate program of study. Five (22%) of our graduates are unemployed and only one graduate is unaccounted for. The past two years of the economic recession has made it more difficult for the more recent graduates to find employment in a Computer Science field.

The positions and the employers (if known) of our graduates include:

- Linux System Administrator, Buffalo, NY
- DBA for bank, Huntington, WV
- Software Engineer, Strictly Business, Huntington, WV
- System Technician, Franklin County Prosecutors Office, Columbus OH
- Lockheed Martin, Clarksburg, WV
- Software Engineer, CityNet, Bridgeport, WV
- Web designer, Up-state NY
- \$42,000 Software Systems Developer, Lockheed Martin, Clarksburg, WV
- Software Systems Developer, Lockheed Martin, Clarksburg, WV
- CEGAS, Marshall University
- System Administrator, Fairmont State, WV
- Software Quality Assurance Engineer, Inovis, Austin, Texas
- Associate Software Engineer, Strictly Business, Huntington, WV
- Board of Education in southern WV
- Software Engineer, Epic, Madison WI
- Graduate Student, University of Central Florida, FL
- Graduate Student, Wake Forest, NC

3. Job Placement

We have been successful in keeping in touch with our graduates in large part because of the efforts of Professor J. Fuller and because of the increased use of the Facebook application. As a result, we have lost track of only one of our graduates. The Marshall University placement office has an excellent online Job Search application. The CS faculty has encouraged our seniors to create an account in that system so that they are aware of job opportunities. It is not clear that graduates continue to check that application after they have been out of school for a few years. This is unfortunate because many positions that are posted require several years of work experience, something that they don't have when graduating but perhaps do have a few years after graduation.

IV. Resource Development (if applicable)

None

Appendix I Required/Elective Course Work in the Program

Degree Program: Computer SciencePerson responsible for the report: Dr. Paulus Wahjudi

Courses Required in Major (By Course Number and Title)	Total Required Hours	Elective Credit Required by the Major (By Course Number and Title)	Elective Hours	Related Fields Courses Required	Total Related Hours
CS110 – Computer Science I CS120 – Computer Science II CS210 – Algorithm Analysis and Design CS300 – Programming Languages CS305 – Software Engineering I CS310 – Software Engineering II CS320 – Internetworking CS330 – Operating Systems CS340 – CyberSecurity CS350 – Database Engineering CS490 – Senior Project I CS491 – Senior Project II	36	CS370 – Computer Graphics CS420 – Distributed Systems CS440 – Image Processing CS480 – Artificial Intelligence CS480 – Parallel Computing CS480 – Visualization Seminar	6	ENGR204 - Intro to Digital Systems ENGR221 - Engineering Economy MTH220 - Discrete Structures MTH229 - Calculus with Analytic Geometry I MTH230 - Calculus with Analytic Geometry II MTH329 - Elementary Linear Algebra MTH345 - Applied Probability and Statistics MGT320 - Principles of Management I ACC215 - Principles of Accounting I Three lab-based science courses	43 - 46

Expand table as needed.

Professional society that may have influenced the program offering and/or requirements: Association for Computing Machinery

(No more than **two** pages; Minimum type 8 point Arial)

Appendix II Faculty Data Sheet

(Information for the period of this review)

Name: James Joseph Fuller Rank: Associate Professor

Status (Check one): Full-time Part-time Adjunct Current MU Faculty: Yes No

Highest Degree Earned: MA Date Degree Received: 1975

Conferred by: Marshall University

Area of Specialization: Mathematics

Professional Registration/Licensure

Years non-teaching experience 2

Years of employment other than Marshall 25

Years of employment at Marshall 5

Years of employment in higher education 30

Years in service at Marshall during this period of review 5

List courses you taught during the final two years of this review. If you participated in a team-taught course, indicate each of them and what percentage of the course you taught. For each course include the year and semester taught (summer through spring), course number, course title and enrollment. *(Expand the table as necessary)*

Year/Semester	Alpha Des. & No.	Title	Enrollment
Fall 2008	CS 110	Computer Science I (Two sections, 50% effort in each class)	66
Fall 2008	CS 210	Algorithms and Data Structures (50% effort)	22
Fall 2008	CS 370	Computer Graphics	9
Spring 2009	CS 110	Computer Science I (50% effort)	26
Spring 2009	CS 120	Computer Science II (50% effort)	52
Spring 2009	CS480	Artificial Intelligence	6
Fall 2009	CS 110	Computer Science I (Two sections, 50% effort in each class)	73
Fall 2009	CS 210	Algorithms and Data Structures (50% effort)	40
Fall 2009	CS 370	Computer Graphics	16
Fall 2009	CS 490	Sr. Projects	39
Spring 2010	CS 491	Sr. Projects	33
Spring 2010	CS480	Artificial Intelligence	9
Spring 2010	CS 110	Computer Science I	38
Spring 2010	CS 120	Computer Science II (50% effort)	36

NOTE: Part-time adjunct faculty do not need to fill in the remainder of this document.

- 1) If your degree is not in your area of current assignment, please explain. My degree is in Mathematics which is considered a related field. I have worked professionally as a software developer and done consulting in mathematics, computer science, and statistics.

(For each of the following sections, list only events during the period of this review and begin with the most recent activities.)

- 2) Activities that have enhanced your teaching and or research. I did consulting for Spatial Integrated Systems .
- 3) Discipline-related books/papers published (provide a full citation).
None
- 4) Papers presented at state, regional, national, or international conferences. None
- 5) Professional development activities, including professional organizations to which you belong and state, regional, national, and international conferences attended. List any panels on which you chaired or participated. List any offices you hold in professional organizations. None
- 6) Externally funded research grants and contracts you received. None
- 7) Awards/honors (including invitations to speak in your area of expertise) or special recognition.
- 8) Community service as defined in the *Greenbook*. None

(No more than **two** pages; Minimum type 8 point Arial)

**Appendix II
Faculty Data Sheet**

(Information for the period of this review)

Name: _____ Venkat N Gudivada _____ Rank: _____ Professor _____
 Status (Check one): Full-time Part-time _____ Adjunct _____ Current MU Faculty: Yes _____ No _____
 Highest Degree Earned: _____ Ph.D. _____ Date Degree Received: _____ May 1993 _____
 Conferred by: _____ University of Louisiana at Lafayette _____
 Area of Specialization: _____ Computer Science (Databases and Image Processing) _____
 Professional Registration/Licensure _____ N/A _____ Agency: _____

Years non-teaching experience _____ 6 _____
 Years of employment other than Marshall _____ 17 _____
 Years of employment at Marshall _____ 7 _____
 Years of employment in higher education _____ 18 _____
 Years in service at Marshall during this period of review _____ 5 _____

List courses you taught during the final two years of this review. If you participated in a team-taught course, indicate each of them and what percentage of the course you taught. For each course include the year and semester taught (summer through spring), course number, course title and enrollment. *(Expand the table as necessary)*

Year/Semester	Alpha Des. & No.	Title	Enrollment
2008/Fall	CS 305 - 101	Software Engineering I	12
2008/Fall	CS 440 - 101	Image Processing	9
2008/Fall	CS 490 - 101	Senior Projects I	39
2008/Fall	HON 101 - 103	Introduction to Honors	15
2009/Spring	CS 300 - 201	Programming Languages	19
2009/Spring	CS 310 - 201	Software Engineering II	11
2009/Spring	CS 350 - 201	Database Engineering	15
2009/Spring	CS 491 - 201	Senior Projects II	24
2009/Fall	CS 305 - 101	Software Engineering I	20
2009/Fall	CS 440 - 101	Image Processing	7
2009/Fall	CS 490 - 101	Senior Projects I	39
2009/Fall	HON 101 - 103	Introduction to Honors	15
2010/Spring	CS 481 - 201	Sp Tp: Parallel Computing	9
2010/Spring	CS 310 - 201	Software Engineering II	18
2010/Spring	CS 350 - 201	Database Engineering	17
2010/Spring	CS 491 - 201	Senior Projects II	33

NOTE: Part-time adjunct faculty do not need to fill in the remainder of this document.

1) If your degree is not in your area of current assignment, please explain.

(For each of the following sections, list only events during the period of this review and begin with the most recent activities.)

- 2) Activities that have enhanced your teaching and or research.
- Served as a Technical Program Committee Member, IEEE/WIC/ACM International Conference on Web Intelligence (2010).

10/14/2010

- Reviewed papers for International Conference on Information Technology: New Generations (2008, 2009).
 - Served as a co-chair in organizing track on Software Engineering education for the ITNG conference (2008, 2009).
 - Served as a technical program committee member for the Intelligent Healthcare Information management session of The 3rd International Symposium on Intelligent and Interactive Multimedia: Systems and Services (KES IIMSS 2010), Baltimore, MD (28 - 30 July 2010).
 - Participated in Process Oriented Guided Inquiry Learning (POGIL), a day-long workshop held at Marshall University, 15 March 2008, 9.00 AM – 4.00 PM.
 - Participated in a workshop titled “Fundamentals of Critical Thinking and the art of Instruction” held at Marshall main campus (21 August 2008, 8.30 AM – 2.30 PM).
 - Participated in a session titled “Using Portfolios for Assessment and Learning,” held at Marshall main campus, 1 February 2008, 1.00 PM – 2.00 PM.
- 3) Discipline-related books/papers published (provide a full citation).
- Venkat Gudivada and Jagadeesh Nandigam. Corporate compliance and its implications to IT Professionals. 6th International Conference on Information Technology: New Generations, Las Vegas, NV (27-29 April 2009), pages 725 -729.
 - Jagadeesh Nandigam, Venkat N Gudivada, Abdelwahab Hamou-Lhadj, and Yonglei Tao. Interface-Based Object-Oriented Design with Mock Objects. 6th International Conference on Information Technology: New Generations, Las Vegas, NV (27 – 29 April 2009), pages 713 – 718.
 - Venkat N. Gudivada and Jagadeesh Nandigam and Jay Bhuyan. A Conceptual Framework for Application Comprehension, 5th International Conference on Information Technology: New Generations, Las Vegas, NV, pp. 483--488, 2008.
 - J. Nandigam and V.N. Gudivada and A. Hamou-Lhadj. Learning Software Engineering Principles Using Open Source Software, The 2008 Frontiers in Education Conference, pp. S3H-18 -- S3H-23, October 2008, Saratoga Springs, NY.
 - Venkat N. Gudivada and Jagadeesh Nandigam and Jay Bhuyan. Strategies for Realism in E-learning Classroom, International Conference on Enterprise Systems (ICES 2008), pp. 267-273, January 2008, Gurgaon, India.
- 4) Papers presented at state, regional, national, or international conferences.
- Presented a paper titled “Interface-Based Object-Oriented Design with Mock Objects,” 2009 6th International Conference on Information Technology: New Generations (ITNG 2009), Las Vegas, NV (27 – 29 April 2009).
 - Presented a paper titled “Corporate compliance and its implications to IT Professionals,” 2009 6th International Conference on Information Technology: New Generations (ITNG 2009), Las Vegas, NV (27 – 29 April 2009).
 - Presented a paper titled “Learning Software Engineering Principles Using Open Source Software,” at the 2008 IEEE FIE conference, Saratoga Springs, NY (22 – 25 October 2008).
 - Presented a paper titled “Strategies for Realism in E-learning Classroom,” at the 2008 International Conference on Enterprise Systems (ICES 2008), Gurgaon, India (10 – 12 January 2008).
- 5) Professional development activities, including professional organizations to which you belong and state, regional, national, and international conferences attended. List any panels on which you chaired or participated. List any offices you hold in professional organizations.
- Member of IEEE Computer Society.
 - Chaired a session titled “Software Engineering Education I” at the 2009 6th International Conference on Information Technology: New Generations (ITNG 2009), Las Vegas, NV (27 – 29 April 2009).
 - Chaired another session titled “Software Engineering Education II” at the 2009 6th International Conference on Information Technology: New Generations (ITNG 2009), Las Vegas, NV (27 – 29 April 2009).
 - Chaired a session titled “Computer and Web Based Software 1” at the 2008 IEEE FIE conference held in Saratoga Springs, NY (22 – 25 October 2008).
 - Attended International Conference on Information Technology: New Generations (2009).
 - Attended 2008 IEEE FIE conference, Saratoga Springs, NY (22 – 25 October 2008).
 - Attended 2008 International Conference on Enterprise Systems (ICES 2008), Gurgaon, India (10 – 12 January 2008).
 - Presented a 3-hour lecture for WV State CIOs and CTOs (IS 651 Special Topics: Information Management in the Public Sector) in South Charleston campus (13 June 2008). Lecture title: Application Development – Practices and Trends.
- 6) Externally funded research grants and contracts you received.
- Cyber-infrastructure for Transformational Scientific Discovery in Arkansas and West Virginia (CI-TRAIN), funded by NSF. This is a multi-institution, multi-investigator grant. My role in this project is to serve as MU faculty champion for promoting high performance research across disciplines and to conduct high performance cyber-infrastructure driven research in software visualization. September 2009 - August 2012. \$1.3 million (Marshall University budget).
 - Finding Needle in a Haystack: A STEM Workshop for High School Students, WV EPSCoR Opportunity Grant program. June 29 – July 3, 2009. \$4,800.
 - Autonomous Marine Navigation (AMN) project from Spatial Integrated Systems of Rockville, MD for \$199,982, 2008.
- 7) Awards/honors (including invitations to speak in your area of expertise) or special recognition.
- 8) Community service as defined in the *Greenbook*.
(No more than **two** pages; Minimum type 8 point Arial)

Appendix II Faculty Data Sheet

(Information for the period of this review)

Name: Jonathan Thompson Rank: _____

Status (Check one): Full-time Part-time Adjunct Current MU Faculty: Yes No

Highest Degree Earned: Master of Science Date Degree Received: May 2001

Conferred by: Marshall University

Area of Specialization: Information Systems

Professional Registration/Licensure _____ Agency: _____

Years non-teaching experience 30

Years of employment other than Marshall 25

Years of employment at Marshall 11

Years of employment in higher education 11

Years in service at Marshall during this period of review 5

List courses you taught during the final two years of this review. If you participated in a team-taught course, indicate each of them and what percentage of the course you taught. For each course include the year and semester taught (summer through spring), course number, course title and enrollment.
(Expand the table as necessary)

Year/Semester	Alpha Des. & No.	Title	Enrollment
2008/Fall	CS320	Internetworking	16
2008/Fall	CS330	Operating Systems	13
2009/Spring	CS110	Computer Science I (50%)	26
2009/Spring	CS120	Computer Science II (50%)	52
2009/Fall	CS120	Computer Science II	5
2009/Fall	CS330	Operating Systems	22
2009/Fall	CS320	Internetworking	22
2010/Spring	CS110	Computer Science I (50%)	38
2010/Spring	CS120	Computer Science II (50%)	36

NOTE: Part-time adjunct faculty do not need to fill in the remainder of this document.

1) If your degree is not in your area of current assignment, please explain.

(For each of the following sections, list only events during the period of this review and begin with the most recent activities.)

- 2) Activities that have enhanced your teaching and or research.
- 3) Discipline-related books/papers published (provide a full citation).
- 4) Papers presented at state, regional, national, or international conferences.
- 5) Professional development activities, including professional organizations to which you belong and state, regional, national, and international conferences attended. List any panels on which you chaired or participated. List any offices you hold in professional organizations.
- 6) Externally funded research grants and contracts you received.

- 7) Awards/honors (including invitations to speak in your area of expertise) or special recognition.
- 8) Community service as defined in the *Greenbook*.

Appendix II
Faculty Data Sheet
 (Information for the period of this review)

Name: _____ Paulus Wahjudi _____ Rank: _____ Assistant Professor _____

Status (Check one): Full-time Part-time _____ Adjunct _____ Current MU Faculty: Yes No _____

Highest Degree Earned: _____ Ph.D. _____ Date Degree Received: _____ December 2007 _____

Conferred by: _____ The University of Southern Mississippi _____

Area of Specialization: _____ Computer Science _____

Professional Registration/Licensure _____ NA _____ Agency: _____ NA _____

Years non-teaching experience _____ 3.0 _____

Years of employment other than Marshall _____ 1.5 _____

Years of employment at Marshall _____ 1.0 _____

Years of employment in higher education _____ 2.5 _____

Years in service at Marshall during this period of review _____ 1.0 _____

List courses you taught during the final two years of this review. If you participated in a team-taught course, indicate each of them and what percentage of the course you taught. For each course include the year and semester taught (summer through spring), course number, course title and enrollment. *(Expand the table as necessary)*

Year/Semester	Alpha Des. & No.	Title	Enrollment
Fall 2009	UNI 101	New Student Seminar	18
Fall 2009	CS 110	Computer Science I (50%)	66
Fall 2009	CS 210	Algorithm Analysis and Design (50%)	40
Fall 2009	CS 490	Senior Project I (50%)	39
Spring 2010	CS 210	Algorithm Analysis and Design	36
Spring 2010	CS 300	Programming Languages	26
Spring 2010	CS 483	SpTp: Visualization Seminar	9
Spring 2010	CS 491	Senior Project II (50%)	33

NOTE: Part-time adjunct faculty do not need to fill in the remainder of this document.

1) If your degree is not in your area of current assignment, please explain.

(For each of the following sections, list only events during the period of this review and begin with the most recent activities.)

- 2) Activities that have enhanced your teaching and or research.
- Participated in MURC grant development workshop on April 16, 2010 (6.5 hours)
 - Participated in Writing Across Curriculum Workshop on April 30, 2010
 - Participated in 2nd Annual Conference on Teaching and Learning “iPED: inquiring pedagogies” on August 17-18, 2010
 - Participated in the Teaching & Learning Workshop sponsored by The Center for Learning and Teaching: August 17-19, 2009.
 - Coach, Marshall University ACM ICPC 2009 Team: October 24, 2009.

- 3) Discipline-related books/papers published (provide a full citation).
 - P. Wahjudi, "Intelligent Framework for Software Analysis, Reuse and Fabrication", *Journal of Management and Engineering Integration* (To appear).
 - J. Jacobs, P. Wahjudi and D. Ali, "Healthy, Efficient, and Affordable Lunch System (HEALS) a Decision Support Tool for School Cafeteria", *Journal of Management and Engineering Integration* (To appear).
 - J. Kackley, P. Wahjudi and D. Ali, "Force Depletion Mechanics as an Evaluation Tool for Mobile Agents", *Journal of Management and Engineering Integration* (To appear).
 - J. Kackley and P. Wahjudi, "Detecting and Combating Compromised Platforms in a Mobile Agent Infrastructure", *Proceedings of the 2nd Cyberspace Research Workshop*, Shreveport, Louisiana, p. 35-41, 2009.

- 4) Papers presented at state, regional, national, or international conferences.
 - P. Wahjudi, "Intelligent Framework for Software Analysis, Reuse and Fabrication", 16th International Conference on Industry, Engineering, & Management Systems, March 8-10, 2010.

- 5) Professional development activities, including professional organizations to which you belong and state, regional, national, and international conferences attended. List any panels on which you chaired or participated. List any offices you hold in professional organizations.
 - Editorial Member for The Association For Industry, Engineering and Management Systems.
 - Program Committee for Workshop on Agent Based Computing: from Model to Implementation VII (ABC:MI'10), October 18- 20, 2010, Wisla, Poland
 - Software Engineering & Education Program Committee for 7th International Conference on Information Technology: New Generations (ITNG 2010), April 12-14, 2010, Las Vegas, Nevada, USA
 - The 2010 Conference on Industry, Engineering and Management Systems, Cocoa Beach, FL, March 8-10, 2010.
 - Judge, Mid Central Region - Association for Computing Machinery International Collegiate Programming Competition 2009: October 24, 2009.
 - Technical Program Committee, 2nd Cyberspace Research Workshop, Shreveport, Louisiana, June 15, 2009.

- 6) Externally funded research grants and contracts you received.
 Computing Technology Farm (CTF) Sponsored by Marshall's Center for Teaching and Learning "Hedrick Program Grant for Teaching Innovation". July 2010-August 2010. \$5000.

- 7) Awards/honors (including invitations to speak in your area of expertise) or special recognition.

- 8) Community service as defined in the *Greenbook*.

Appendix IIa Teaching Assistant Data Sheet

GTA Name	Course No. (e.g. 101)	Course Name	Year 1 20__ - 20__			Year 2 20__ - 20__			Year 3 20__ - 20__			Year 4 20__ - 20__			Year 5 20__ - 20__		
			Su	Fa	Sp	Su	Fa	Sp	Su	Fa	Sp	Su	Fa	Sp	Su	Fa	Sp
None																	

Complete graduate teaching assistant's name; course number and course name taught; indicate enrollment in the semesters taught.

Appendix III Students' Entrance Abilities (Computer Science)

Year	N	Mean High School GPA	Mean College GPA	Mean ACT	Mean SAT Verbal	Mean SAT Quantitative
Fall 2005	14 Freshmen 1 Transfer	3.49 3.50	--- 3.50	24.9 (n = 12) 28 (n = 1)	535 (n = 6) 570 (n = 1)	620 (n = 6) 620 (n = 1)
Spring 2006	--- 1 Transfers	--- ---	--- 3.06	--- ---	--- ---	--- ---
Fall 2006	12 Freshmen 3 Transfers	3.40 3.96	--- 2.41	24 (n = 10) 25 (n = 1)	531.7 (n = 6) 580 (n = 1)	548.3 (n = 6) 590 (n = 1)
Spring 2007	--- ---	--- ---	--- ---	--- ---	--- ---	--- ---
Fall 2007	18 Freshmen 2 Transfers	3.51 3.15	-- 3.13	25.8 (n = 15) 22.5 (n = 2)	593.3 (n = 6) ---	588.3 (n = 6) ---
Spring 2008	--- ---	--- ---	--- ---	--- ---	--- ---	--- ---
Fall 2008	18 Freshmen 4 Transfers	3.49 3.41	-- 2.51	25.3 (n = 16) 26.5 (n = 2)	525 (n = 6) 670 (n = 1)	585 (n = 6) 490 (n = 1)
Spring 2009	-- 1 Transfer	--- 2.87	-- 1.37	--- 22 (n = 1)	--- ---	--- ---
Fall 2009	18 Freshmen 9 Transfers	3.49 3.35	--- 2.67	26.1 (n = 18) 24 (n = 5)	450 (n = 1) 465 (n = 2)	570 (n = 1) 460 (n = 2)
Spring 2010	--- 2 Transfers	--- 2.12	--- 3.38	--- 17 (n = 1)	--- ---	--- ---

Appendix III Students' Entrance Abilities (Pre-Computer Science)

Year	N	Mean High School GPA	Mean College GPA	Mean ACT	Mean SAT Verbal	Mean SAT Quantitative
Fall 2005	4 Freshmen 1 Transfer	3.30 ---	--- 3.51	24 (<i>n</i> = 4) 19 (<i>n</i> = 1)	--- ---	--- ---
Spring 2006	--- ---	--- ---	--- ---	--- ---	--- ---	--- ---
Fall 2006	7 Freshmen 1 Transfer	3.00 ---	--- 3.29	21.9 (<i>n</i> = 7) 19 (<i>n</i> = 1)	--- ---	--- ---
Spring 2007	--- ---	--- ---	--- ---	--- ---	--- ---	--- ---
Fall 2007	8 Freshmen 1 Transfer	2.62 1.88	-- 2.77	19.7 (<i>n</i> = 7) ---	560 (<i>n</i> = 3) ---	483.3 (<i>n</i> = 3) ---
Spring 2008	--- 1 Transfer	--- 3.02	--- 2.19	--- 17 (<i>n</i> = 1)	--- ---	--- ---
Fall 2008	15 Freshmen 2 Transfers	2.99 ---	-- 2.73	22.4 (<i>n</i> = 14) ---	495 (<i>n</i> = 2) ---	480 (<i>n</i> = 2) ---
Spring 2009	-- ---	--- ---	-- ---	--- ---	--- ---	--- ---
Fall 2009	8 Freshmen 3 Transfers	3.25 2.52	--- 0.82	21.5 (<i>n</i> = 8) 19 (<i>n</i> = 1)	500 (<i>n</i> = 2) ---	485 (<i>n</i> = 2) ---
Spring 2010	--- ---	--- ---	--- ---	--- ---	--- ---	--- ---

Appendix IV
Students' Exit Abilities (Computer Science)

Year	N	Mean GPA	Licensure Exam Results	Certification Test Results	Other Standardized Exam Results
2005-06	0	---	NA	NA	NA
2006-07	0	---	NA	NA	NA
2007-08	8	3.24	NA	NA	NA
2008-09	9	3.13	NA	NA	NA
2009-10	6	3.22	NA	NA	NA

Appendix V
Assessment Summary
Marshall University
Assessment of the Program's Student Learning Outcomes
 5 year summary

Component Area/Program/Discipline: Computer Science

Program Level				
Program's Student Learning Outcomes	Assessment Measures (Tools)	Standards/Benchmark	Results/Analysis	Action Taken to improve the program
1. The student will have the background necessary to pursue advanced degrees or a career in industry	1. A. The faculty will review the curriculum annually in terms of Computer Science curriculum guidelines.	1.A. The curriculum should adhere to the Computer Science degree program guidelines published by the Association for Computing Machinery (ACM).	1.A. The curriculum adheres to the ACM guidelines.	1.A. The faculty will continue to monitor the ACM guidelines for changes.
	1.B. The curriculum will be reviewed annually to ensure that the course offerings and content are relevant and up-to-date in the rapidly changing field of Computer Science.	1. B. There are no standards or benchmarks therefore the faculty must identify trends in academia and industry regarding activities related to Computer Science.	1.B. The program needs to offer more electives in current topics related to Computer Science.	1.B. A seminar on Visual Computing was offered in the Spring of 2010. A special topics course on Parallel Computing was offered in the Spring of 2010. A special topics course on Current Topics in Computer Science will be offered in the fall.

	<p>1. C. The curriculum will be reviewed annually to ensure that the course offerings and content provide the student with a solid foundation in core Computer Science courses.</p>	<p>1. C. While formal benchmarks have yet to be identified, the faculty can evaluate the curriculum based on overall student performance in core areas of Computer Science.</p>	<p>1. C. Several topics currently covered in CS305 – Software Engineering I and CS310 – Software Engineering II need to be distributed across the three introductory Computer Science courses so that the students receive exposure to these important topics over three semesters on a more continual basis.</p> <p>The students need more exposure to formal Computer Science theory.</p> <p>The students need additional instruction and experience in Algorithm Analysis and Design.</p>	<p>1. C. Beginning in the Fall of 2012, CS305 and CS310 will be consolidated into a single CS305 offering and the remaining topics will be distributed across CS110 – Computer Science I, CS120 – Computer Science II, and CS210 – Algorithm Analysis and Design.</p> <p>Beginning the Spring of 2013, a new course in Automata Theory will be offered.</p> <p>Beginning in the Spring of 2012, a required course in Advanced Algorithm Analysis and Design will be offered.</p>
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	1.D. Course content and pedagogy will be reviewed and adjusted after each semester the course is offered based on student feedback.	1.D. Course instructors will review the Course Evaluation results provided by the University and will review and discuss effective and ineffective course changes implemented in the prior semester.	1. D. Each course could use improvement.	1. D. Course pedagogy and content has been adjusted each semester.
	1. D. The faculty and department chair will review the equipment that is available to the students and instructors.	1.D. There are no published standards or benchmarks therefore the faculty and department chair will assess the equipment based on current trends and departmental budgetary constraints.	1. D. The computers in the two Computer Science Labs need to have CUDA-capable graphics cards, monitors with increased resolution and surface area, and more main memory.	1. D. The computers in the two Computer Science Labs will be replaced with current models in the Summer of 2010.
2. The student will demonstrate mastery of CS and have broad understanding of computing at all levels of abstraction.	2.A. Capstone project class	2.A. The program assess students' ability on problem analysis, research design and experimentation, combined with an understanding and appreciation of data structures, advanced programming, algorithms and software engineering.	2.A. The student projects were comprehensive with varying degree of technical requirement and difficulties however there are tendencies of overpromising and under deliver.	2.A. Senior Project are being revamped to have specific target dates and objectives along with the assignment of an individual faculty as a project advisor to supervise and monitor progress. Senior project will also be geared towards undergraduate research and scholarly projects

	2.B. Course exams, programming lab, programming assignments, and class projects that	2.B. Test students' ability analyze a problem, develop a programming solution to it, code and execute the program, test, interpret and experiment with results.	2.B. The students have demonstrated proficiency on computing skills although each student have their own strength and weaknesses.	2.B. Several courses are being redesigned to provide more challenging hands-on practice of various CS subjects .
3. The student will design, analyze, and apply algorithms.	3.A. Test grades, in-class, programming assignments, and programming project.	3.A. There are no set of standards on how to assess an individual's ability to design, analyze and apply algorithms.	3.A. Currently, data structures and algorithms are covered under one class. Although the students perform well in the course it stresses more on data structures than algorithms.	3.A. Part of the Data Structures materials will be covered in CS120: Introduction to CS II course .
	3.B. Semester long class projects	3.B. Students are evaluated on the development of an algorithm that will solve a given open ended problem and the implementation of the computational solution in relation to the algorithm effectiveness and efficiency.	3.B. Combining data structures and algorithm in one class limits the amount of information that can be covered in both subject.	3.B. Beginning in the Spring of 2012, a required course in Advanced Algorithm Analysis and Design will be offered (CS215).
4. The student will analyze and implement a large-scale and significant project as team member or individual contributor	4. The student will plan and execute a comprehensive project.	4. Each student will demonstrate this outcome by passing CS490 – Senior Project I and CS490 – Senior Project II	4. All CS graduating students who completed their projects achieved this level of performance.	4. Continue to assess how we can continually improve the CS490/491 Senior Project experience for the student.

5. The student will demonstrate the ability to communicate effectively through written assignments and through public speaking presentations	5.A. Written assignments in CS305 – Software Engineering I and CS310 – Software Engineering II	5.A. Students will average at least 85% on all written assignments in CS305 and CS310.	5.A. Students have averaged at least 85% on all written assignments in CS305 and CS310.	5.A. This results is satisfying and we will continue to emphasize good writing skills through these assignments.
	5.B. Research report and presentation in CS330 – Operating Systems	5.B. Students will receive a grade of C or better on the written and orally presented research report for CS330.	5.B All students received a grade of C or better on the written and orally presented research report for CS330.	5.B. The measure of student presentations has been somewhat subjective in nature. We will look into what possibilities there might be to make this outcome evaluation more objective through rubric development.
	5.C. Written and orally presented Senior Project report for CS490 – Senior Project I and CS491 – Senior Project II.	5.C. Students will receive a grade of C or better on the written and orally presented project report.	5.C. All students have received a grade of C or better on the written and orally presented project report.	5.C. The rubric for determining the grading on the student presentations is somewhat subjective; will try to increase objectivity.
6. The student will function as ethically and socially responsible computer professionals, including membership in professional organizations	6. A. Student participation in introductory discussions regarding ethics in CS110 – Computer Science I and CS120 – Computer Science II.	6.A. 90% of students will have participated in the ethics discussions in CS110 and CS120.	6. A. A majority of students participated in the ethics discussions in CS110 and CS120.	6.A. A more formal and organized approach to these discussions needs to be addressed.

	6.B. Student participation in discussions regarding restrictions in the use and acknowledgement of copyrighted and proprietary code in CS330 – Operating Systems.	6.B. 90% of students will have participated in the discussions regarding restrictions in the use and acknowledgement of copyrighted and proprietary code in CS330 – Operating Systems.	6.B. Students have been exposed to discussions regarding restrictions in the use and acknowledgement of copyrighted and proprietary code. Participation in these discussions have been limited.	6.B. Continued emphasis on these important topics. We will attempt to develop more objective measures and rubrics for these important topics.
	6.C. Participation in the student chapter of the Association of Computing Machinery.	6.C. At least 50% of junior and senior Computer Science majors are active members in the student chapter of the ACM.	6.C. There are currently 15 student members in the ACM.	6.C. This represents an all-time high in membership. We will continue to strive to increase membership.

Appendix VI Program Course Enrollment

Course Number	Course Name	Required/ Elective/ Service	Delivery Method	Location	Year 1 2005-2006			Year 2 2006-2007			Year 3 2007-2008			Year 4 2008-2009			Year 5 2009-2010		
					Su	Fa	Sp	Su	Fa	Sp	Su	Fa	Sp	Su	Fa	Sp	Su	Fa	Sp
CS110	Computer Science I	R+S	Td	Huntington		62	42		56	16		41	34		66	26		68	38
CS120	Computer Science II	R	Td	Huntington		24	46		28	40		9	46		7	52		5	36
CS210	Algorithm Analysis and Design	R	Td	Huntington		10	5		32	9		11	24		22	8		40	5
CS300	Programming Languages	R	Td	Huntington			10			17			16			19			26
CS305	Software Engineering I	R	Td	Huntington					11			18			12			20	
CS310	Software Engineering II	R	Td	Huntington						12			16			11			18
CS320	Internetworking	R	Td	Huntington					13			16			16			22	
CS330	Operating Systems	R	Td	Huntington					14			20			13			22	
CS340	Cyber Security	R	Td	Huntington						12			14			8			21
CS350	Database Engineering	R	Td	Huntington						13			13			15			17
CS370	Computer Graphics	E	Td	Huntington								11			9			16	
CS420	Distributed Systems	E	Td	Huntington									3						
CS440	Image Processing	E	Td	Huntington								8			9			7	
CS475	Internship	E	Td	Huntington				1			2					1	1		
CS480	SpTp: Applied Statistics	E	Td	Huntington		4													
CS480	SpTp: Artificial Intelligence	E	Td	Huntington									8			6			9
CS480	SpTp: Info Mgt Public Sector											6							
CS481	SpTp: Parallel Computing	E	Td	Huntington															9
CS482	SpTp: Visualization Seminar	E	Td	Huntington															9
CS485	Independent Study	E	Td	Huntington									1						
CS490	Senior Project I	R	Td	Huntington								24			39			39	
CS491	Senior Project II	R	Td	Huntington								1	30			24			33

Indicate all program and service courses. Please include all special topics courses offered as well as independent studies. When listing Independent studies, please list the **number of independent study students enrolled**, but **DO NOT** include individual names or the titles of the independent studies. Please use the following codes:

Required/Elective: Required = R; Elective = E; Service = S (Please indicate all that apply; e.g. E + S, if the course is both an elective and a service course.

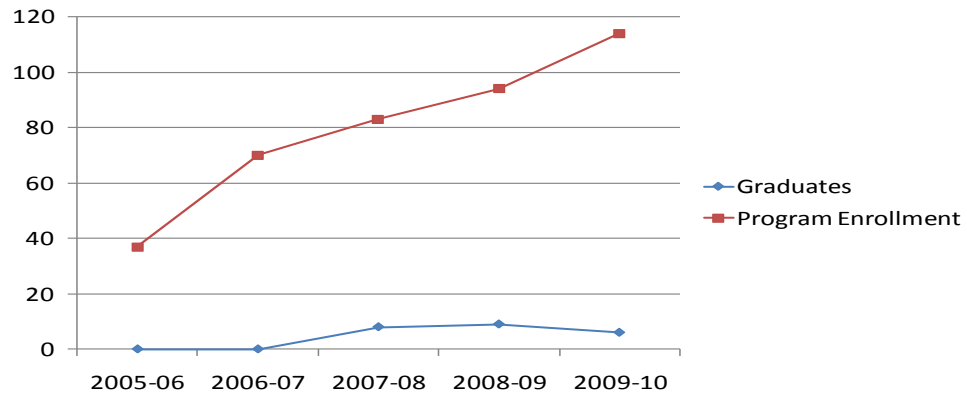
Delivery Method: Traditional = Td, Online = O, Hybrid = H

Location: Huntington, South Charleston, Point Pleasant, etc.

**Appendix VII
Program Enrollment (Computer Science)**

Students	Year 1 2005-2006	Year 2 2006-2007	Year 3 2007-2008	Year 4 2008-2009	Year 5 2009-2010
New Students Admitted (Pre-CS)	4	7	8	15	8
New Students Admitted (CS)	5	8	9	17	11
Principal Majors Enrolled Area of Emphasis 1: (Pre-CS)	7	19	16	19	17
Principal Majors Enrolled Area of Emphasis 1: (CS)	30	51	67	75	97
Principal Majors Enrolled Area of Emphasis 2:					
Principal Majors Enrolled Area of Emphasis 3:					
Principal Majors Enrolled Additional Areas of Emphasis					
Second Majors Enrolled*	2	1	3	2	2
Third Majors Enrolled:**					
Other Areas of Emphasis (i.e., education specialization majors)					
Minors***					
Grand Total of Students Enrolled in the Program	39	71	86	96	116
Graduates of the program	0	0	8	9	6

Figure 1. Trend Line for Program Enrollment and Program Graduates



Appendix VIII
Job and Graduate School Placement Rates

Year	# of graduates employed in major field	# of graduates employed in related fields	# of graduates employed outside field	# of graduates accepted to Graduate Programs	# of graduates not employed	# of graduates not accounted for
2005-06	0	0	0	0	0	0
2006-07	0	0	0	0	0	0
2007-08	4	0	0	0	0	4
2008-09	5	0	0	1	2	1
2009-10	2	0	0	1	2	1
Five –Year Total	15	0	0	2	5	6

Appendix VIII Letters from Employers

From: Steph Pedersen [mailto:spederse@epic.com]
Sent: Friday, July 23, 2010 12:50 PM
To: Gudivada, Venkat
Subject: Job offer to your students

Dear Professor Gudivada,

My name is Steph and I am a recruiter at Epic, a healthcare software company based in Madison, Wisconsin. (If you haven't heard of Epic, don't be surprised—Forbes recently referred to us as the "Silent Giant" of the electronic medical records industry.) We've had the pleasure of interviewing Dustin Vickers, who listed you as a reference. We are very impressed by the quality of your student and have extended an offer for one of our positions.

We know that the students graduating from Marshall University are of a high caliber and that the professors and staff are doing a wonderful job. We would love to see more of your students in our interview process. Could you pass this message along to students, or if you have any other fantastic students who would like to work in a fast-paced and growing healthcare technology company whom you could recommend, we would really appreciate it. They are welcome to email me their resume directly or check us out at <http://careers.epic.com/>.

We're looking for people from all backgrounds and majors. We have one of the most selective hiring processes in the U.S., so when you work here, you'll get to collaborate with the brightest minds in the healthcare industry and make a difference from day 1. Improve healthcare, get great benefits, and wear jeans to work.

If you have any questions about Epic or our recruiting process, feel free to email me or take a look at our website. Thanks for your help and for being such a devoted educator.

Respectfully,

Steph Pedersen
Epic | Human Resources
608-271-9000 | spederse@epic.com

Appendix VIII
Copies of Annual Assessment Reports



w w w . m a r s h a l l . e d u

Office of Assessment & Program Review

May 18, 2010

Dr. Bill Pierson, Division Chair
Engineering and Computer Science
CITE

Dear Bill,

This letter will document that the Office of Assessment did not receive an annual assessment report for the BS in Computer Science Program for the academic year 2008 – 2009 (report was due December 1, 2009). I will contact you at the beginning of the fall 2010 semester to discuss the report due December 1, 2010.

Sincerely,

Mary E. Reynolds

Mary E. Reynolds
Director of Academic Assessment

C: Dr. Betsy Dulin, Dean, CITE



Office of Assessment & Program Review

April 7, 2009

Dr. Bill Pierson, Division Chair
Computer Science
CITE

Dear Bill:

The University Assessment Committee and I have completed our evaluation of the BS in Computer Science's assessment of student learning. This letter will provide my general comments and suggestions for improvement. Although the scoring rubric we used to evaluate assessment reports is attached, I will not include numerical ratings in this letter. The reason for this is that we used the attached rubric for the first time this year and, as you will see, it has changed considerably from the ones used in previous years. It raises the bar for what is considered excellent assessment considerably and, since it was not shared with programs before this assessment cycle, I'm not comfortable using it to give programs a formal rating this year. However, I ask that you use it for formative purposes to help improve your assessment plan. We also would appreciate your comments concerning this new rubric.

Your report is easy to follow. Some of your student learning outcomes are measurable and stress higher levels of thinking, e.g. "Students will be able to analyze, design, and apply algorithms," while others are less clear, e.g. the first two outcomes sound like they're targeting content knowledge. First, how do they differ from each other? Second, how will you know students have the necessary background to complete advanced degrees? Will they explain, analyze, or evaluate specific content?

I love your outcome/course matrix. Thank you for doing this! This shows clearly where in the curriculum each outcome is being assessed. You've also identified a nice array of complementary direct and indirect assessment measures for each outcome. What your report lacks this year is appropriate benchmarks, results, and actions taken to improve the program. I recommend that you set up a 4-year plan to assess student learning outcomes. In other words, next year you might conduct an in-depth assessment of the first two outcomes, both of which appear to focus on content knowledge. You indicate that you assess these outcomes using projects, exams, written reports, class presentations, lab assignments, the comprehensive evaluation, employer interviews and student advising sessions. You should develop analytic scoring rubrics for projects, written reports, and class presentations. Benchmarks would be the mean acceptable score across students. So, if you use a 4-point scale, with 4 being "exceeds expectations" and 3 being "meets expectations," you might want to see a mean of 3.5 in each area of the scoring rubrics across students. Then, you would report results for each assessment in each area and should be able to aggregate results to see if there are trends in the data that will suggest program improvement. Then, the following year you might assess outcomes 3 and 4. At the same time, you'll be implementing changes in your program based on the previous year's assessment.

Please see the attached rubric and letter to Deans, Chairs, and Faculty detailing general suggestions for an effective assessment program. If you have questions or concerns, please let me know.

Sincerely,

Mary E. Reynolds

Mary E. Reynolds
Director of Academic Assessment

C: Dr. Betsy Dulin, Dean, CITE



Office of Assessment & Program Review

April 8, 2008

Dr. Bill Pierson, Division Chair
Engineering and Computer Science
CITE

Dear Bill,

This letter will document that the Office of Assessment did not receive an annual assessment report for the BS in Computer Science for the academic year 2006 – 2007. I would be happy to work with you as you develop your assessment plan. I can be reached at 62987 or at reynoldm@marshall.edu

Sincerely,

Mary E. Reynolds
Interim Director of Assessment

C: Dr. Anthony Szwilski, Interim Dean, CITE

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File



Office of Program Review and Assessment
 Academic Affairs
 Marshall University
 Huntington, WV 25755-2003

To: Dr. William Pierson
 From: Bob Edmunds, Coordinator for Program Review and Assessment
 Date: June 14, 2006

RE

Yearly Assessment Report for: BS Computer Science

No report was submitted for the program. This program was reinstated during the 2004-2005 academic year. Please use the information in this report to guide your assessment activities during AY 2006-2007

The Yearly Assessment Report for documenting AY 2005-2006 assessment activities is due by October 3, 2006. If the program is scheduled for a program review during the 2006-7 academic year, the Program Review will suffice as the documentation of assessment activities and no separate report will be due.

Reviewer summary of yearly assessment report:

What follows is a brief critique of the report you submitted for the academic year 2004-2005. In most cases the report has been reviewed by members of the University Assessment Committee.

Yearly Assessment Report Critique	
I. a. Program goals:	No report submitted.
b. Learning outcomes and data collection:	
c. Results:	
II. BOT Initiative #3:	
III. Plans for current year:	
IV. Assistance needed:	
V. Lessons learned:	

Review of the Assessment Summary Chart "Marshall University: Assessment of Student Outcomes."

This chart will help the program and the University Assessment Committee monitor a program's patterns of evidence. Please remember that a program does not have to assess every outcome every year; however, within a 3-4 year period of time all program objectives must be evaluated, results analyzed, and actions taken (feedback loop) documented.

Efficacy of Assessment:

Programs are evaluated in terms of the development of measurable learning outcomes, the use of viable assessment measures, and the implementation of an effective feedback loop. The current report has been

evaluated based on these categories. This year the report shows program scores from 2000-2001 to the present.

Scores					
Categories	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005
I. Learning Outcomes					
II. Assessment Measures					
III. Feedback Loop					
Total Overall Score:					
Level of Implementation (efficacy of assessment)					

Score Ranges	
Score Ranges 0-3 in each of the three categories	A score of 0 indicates minimum activity in the category
	A score of 1 indicates that a program is in the beginning stages of assessment
	A score of 2 indicates that a program is making progress toward implementing a viable assessment program
	A score of 3 indicates that a program is in the maturing stages of its assessment program

Levels of Implementation Efficacy of Assessment	
A total overall score between 0 and 3 indicates	Level 1: the program is in the beginning stages of its assessment of student academic achievement
A total overall score between 4 and 6 indicates	Level 2: the program is making progress toward implementing a viable assessment program
A total overall score between 7 and 9 indicates	Level 3: the program is in the maturing stages of continuous improvement of student academic achievement

Interpretation:

Recommendations:

This program has been recently reinstated. The program needs to complete an assessment plan and begin preparing assessment reports in accordance with the University assessment plan. In the program review you will need to provide information concerning the assessment of this program and the measures that are currently in place. An assessment summary chart will need to be prepared outlining the program outcomes and any data that has been collected up to this point.

General Comments:

The program review for this program will be a progress report as the program has not been active for the full five year period.

Thanks so much for continuing to aid Marshall in its ongoing assessment efforts.