DEPARTMENTAL YEAR END REPORT, 2013-2014

Academic Departments

Please submit one copy to Dean and one copy to Provost by June 15

Department of Computer Science (CS)

I. **ASSESSMENT**

Mission, Themes, Goals, and Objectives

Please summarize and highlight noteworthy departmental efforts to support objectives outlined in the Academic Plan, the University Strategic Plan, and any department- or college-based planning documents, as well as University-wide programs and initiatives.

**Highlights:**

1. The ABET re-accreditation process reached a crescendo with the ABET evaluators visiting in September 2013. This Herculean multi-year effort proved valuable as a motivation towards promoting assessment, improvement, curricular currency, and empowering us with a unified focus. Extensive documentation, statistics, and interviews (with students, alumni, faculty, and administrators across several departments) reflected the excellence of our institution, the university community/culture, and our program. Some departmental procedural documentation and some online record-processing enhancements would prove beneficial and we have implemented most of them already. Stricter tracking and adherence to prerequisite rules are being applied. We are redoubling assessment efforts with greater documentation of procedure, especially in terms of improvements and PO – PEO modification. So the results are positive for our program; however, the final verdict arrives in June 2014. As ABET’s criteria are consistent with the goals of the University Strategic Plan, those of COSH, and department goals and objectives, we will dedicate maximal effort in these directions in any event. Continued course excellence/currency, student retention, research, and program improvements remain prominent in our directives.

2. Just keeping continuity of faculty was a major effort. With the departure of Dr. Chris Leberknight, we are stretched thin in ranks. To stave off the relentlessly creeping attrition of faculty (as CS went from 10 to 7 and then suddenly 6), the dean, the chairperson, and Dr. Ku worked hard in Summer 2013 to find and hire a fine 1-year faculty, Dr. Ursula Wolz. A graduate of MIT and then Columbia University, she came to WPUNJ with an extensive background in Computer Science. She enlivened our students with cloud-computing, innovative programming exercises, and enriching experiences, well beyond the scope of standard instruction.

As a more permanent solution, the recruitment committee conducted a faculty search to fill our tenure-track CS position, one meeting our future needs for expertise in wireless/mobile networking, cloud computing, and IT. After reviewing numerous candidates and interviewing selectively-narrowing subsets on at first Skype and then in-person, we have successfully completed the search with final candidate, Dr. Salimur Choudhury. He accepted our job offer recently, resulting in a successful search.
3. Compounding the loss of faculty was the tragic passing of lab support professional, Marvin Kiss. A dear friend to both CS faculty and students, his expertise in EE and CS was unique, in depth, and extensive in covering all aspects of our labs’ operations. This includes both hardware and software installation, configuration, integration, and management for our servers and clients in UNIX, Windows, X-Windows, and VMware. In the aftermath, we are struggling to retain normalcy and services. A comprehensive reformulation of the lab disk images for all CS computers is in progress. As all client computers are being replaced in summer 2014 (following a 3-year cycle), the software to support teaching and research requires a new disk image. This entails meticulous preparation to determine and address software needs and currency projected for the next three years, encompassing the full spectrum of our growing list of courses and research requirements. The initial phase is complete; the summer will be the deployment phase when the new hardware arrives. We will be meeting with IT to determine how to proceed and support options in light of circumstances.

4. The new CIT (Computer Information Technology) major proposal was just approved by the Board of Trustees. The next phase is getting state approval. With the painstaking strategizing in design (beginning over a decade ago) and the consultant’s report’s outcome (prognosis: excellent) last year, we anticipate a glorious launch in Spring 2015.

5. Established a good relationship with UPS Information Services. We are planning to apply the annual gift of $10,000 per year funding for lecture series and other activities. UPS also gave us internships and gave inspiring presentations to students, as forums for professional growth and career-oriented decision-making. CIT will play a key role in this as well.

6. Faculty and student research and scholarly activities continue. Many students involved in research and scholarly activities with present faculty. Dr. Salimur Choudhury is already planning on how to proceed in grant work and engaging students in research projects. All the networking/security lab equipment purchased by Dr. Leberknight is now being used in student projects and the present labs.

7. Enrollment of total CS majors continues to steadily increase from fall 2008 to fall 2013.

8. In terms of curriculum, we are more current now, with greater recognition of networking. As the ACM noted the trend, a previous ABET indicated, and numerous constituencies (students, CS Advisory Board, parents, and the Board of Trustees) clearly remarked, this is a much needed infusion of the modern context of computing. After much debate, we have voted for and implemented the first required-course change in almost two decades! CS 3380 “Networking Fundamentals and NetCentric Computing” is a required course, the only required networking in the major. Another great trend is offering CS 3990 Selected Topics every semester for the last three years and next year. This provides a rapid way to present new state-of-the-art subjects as electives. The last three CS 3990 course offerings are in different aspects of Computer-based Networking, specifically:
   - CS 3990 Selected Topics: NetCentric Computing
CS 3990 Selected Topics: Network Security
- CS 3990 Selected Topics: Internet Applications with Java

9. Students have requested and are providing direct input in a meeting/forum with faculty. This is an important aspect of program level assessment in collecting direct feedback from students, an important constituency in the model. Agreements were reached in the exchange of ideas, negotiations, and meeting of minds.

Program Quality

Curriculum

1. Describe briefly any major curricular developments in process.

Highlight #8 above summarizes a key trend.

Networking Arrives!

Networking was optional in the 1980’s early IBM PC’s as add-on expansion-card modems. In the 1990’s, we see modems top-out at 57K bits per second, the web is created in 1991, Windows 95 comes out in 1995 to make a stable platform for web browsers, and the Web goes commercial in the same year as a major evolution/revolution in the human race. By 2000, broadband is taking over. Mobile computing grows in this last decade. The ACM and the literature recognize these trends as the new ACM curriculum reflects it.

Finally, now we require networking as of 2013, in the course CS 3380 “Networking Fundamentals and NetCentric Computing”, after a decade of cycles of repeated negotiation and voting in the Curriculum Committee. Part of it was offered in CS 3990 Selected topics for three years with packed classrooms. The Fall 2013 and Spring 2014 CS 3380 sections are still packed, as it will be offered every semester. CS and CIS minors are also interested in this course, as are some non-majors.

CS 3720 “Design & Analysis of Algorithms” has been moved to the category of elective (with nearly empty classrooms) and successive cancellations. CS 3420 Data Structures covers all the needed material from CS 3720 and was raised to four credits for that purpose three years ago. Now the process is complete.

Our faculty are more dedicated to Networking than ever. Besides CS 3380, we have:
- For decades, Dr. Hu offered the elective CS 4300 “Data Communications and Computer Networks”.
- In Fall 2010, 2011, and 2012, Dr. Najarian offered CS 3990 “Selected Topics: NetCentric Computing” (exceeding the limit by one semester).
- CS 3990 “Selected Topics: Network Security” was offered by Dr. Hu twice and by Dr. Wolz once. This is in 2011, 2012, and 2013.
- CS 3990 “Selected Topics: Internet Applications with Java” will be offered by
Dr. Ndjatou in Fall 2014 and Spring 2015. Dr. Chowdhury will further promote the cause with course development in wireless networking. CIT will also have a strong Networking component. In summary, our department is heavily invested in it.

B.S. in CIT (Computer Information Technology) Major:

The new CIT (Computer Information Technology) major proposal was just approved by the Board of Trustees. It was presented to the Committee on Curriculum first with positive comments. The next phase is getting state approval (process in progress. All the planning, prior comments, and the consultant’s (Dr. Rutherfoord of Southern Polytechnic State University) report strong approval last year, we anticipate an initial offering in Spring 2015. Numerous students and parents have expressed interest in this.

Course Development:

- Most CS faculty modify and improve courses based upon semesterly collection of assessment data in every course and course binder reviews.
- Dr. Hu has:
  - 1) introduced features including arrays, and new STL container classes of the newest C++ language standard C++ 11 in CS2300, CS2400, and CS3420, the three CS required core courses based on C++;
  - 2) used Python in CS4300 as an alternative to C and JAVA to implement socket programs on both client and server sides. Python offers a higher level of abstract thus making network programming a lot easier. As a result, all students in the class were able to complete the programming assignments and acquire fundamental knowledge and skills of network programming.
  - 3) extended last year’s success in using Wireshark, a protocol analyzer, for students to learn and gain hands-on experience with TCP/IP has encouraged him to expand the lab assignments to cover HTTP, DNS, TCP, IP, Link, DHCP, and other protocols.
  - 4) increased the coverage of analysis of algorithms in CS3420 in view of the fact that CS3720 Design and Analysis of Algorithms is no longer a required CS major course and the basic understanding of algorithm analysis remain critical in selecting the proper algorithm (data structure) in solving a practical program or implementing a large software project;
  - 5) provided Dr. Wolz with a set of lab assignments on cryptography which he developed a couple of years ago to facilitate her teaching the CS3990 Computer Security class.
- Dr. Ku expanded his networking in terms of Web page and site design in CS 2100. He has included progressively greater coverage of UML as a modeling tool and the Agile method, among others. In CS 4400 Database Management, this meant SQL for query construction.
- Dr. Ndjatou, as chair of the committees on Curriculum and on Assessment, promoted curriculum currency, assessment of SLO’s, and ABET documentation/procedures. In CS 3820 “Programming Languages”, he augmented the course with greater coverage of modern scripting
languages on the web such as PHP, Python, Perl, Ruby, and other server side solutions, both as a uniform class coverage and in individualized projects for greater depth. He is developing the course CS 3990 “Selected Topics: Internet Applications with Java” for next year.

- Dr. Su has been revising CS2800 (Computer/Assembly Language) with assessment based fine tuning to improve student success. He enhanced CS major core course CS4410 “Computer Architecture” by adding content in the areas of cloud computing architecture and graphic processing units (GPU’s), both at the frontiers of the science.

- Dr. Najarian created the constructed the course CS 3380 “Networking Fundamentals and NetCentric Computing” (http://cs.wpunj.edu/%7Enajarian/cs338/cs338main.html) based upon a balanced blend (finalized at the curriculum meeting of November 2013):
  - CS 3990 Selected Topics: NetCentric Computing, covering HTML 5 (an obsession for 5 years), CSS3, JavaScript, and other web programming areas
  - Computing Fundamentals, a convex combination Microsoft Network Essentials, the Cisco certification/school of networking, Network+, and OSI vs/ & TCP/IP.

  It is enriching beyond two courses and intensely current in that HTML 5 and other web standards are evolving monthly and will do so for the next decade.

  * In CS 2600 “Discrete Structures”, he put greater emphasis on CS applications, especially Cryptography based number theory basics, but with mixed results in Fall 2013. As an improvement based on course assessment statistics, he reversed the effect in Spring 2014 to a more abstract modeling with lighter coverage of applications and greater coverage of conceptual problem solving. The results were improved grades and general performance.

  * In CS 4610 “Computer Graphics”, in the last week, we attempted to add WebGL coverage but our classroom PC’s could not handle it. The problem was the disk image was not sufficiently current, given it is the end-phase of the 3-year hardware replacement cycle (coupled with the ABET visit and the loss of CS lab technician). Such is life on the “bleeding-edge”; this problem will be rectified in Summer 2014, both in hardware and software, as a key improvement.

- Dr. Wolz has applied cloud computing and several innovations to CS 2150, CS 2120, and CS 3990 “Selected Topics: Network Security”. She stresses student project work, their empowerment with active learning, and other modern methodologies.

2. Comment on curricular developments, changes, activities which have resulted in:
   a) the identification or clarification of student learning goals in the major and/or in UCC courses offered by the department;

   As the ABET review cited the necessity of consolidating learning outcomes and focusing on the measurable ones, we have responded by modifying the Program Outcomes in Math and Science to reflect their not being departmentally measurable in terms of assessment or controlled in terms of direct pedagogical improvement. The intention is that all the Math and Science requirements remain as before and compliant with ABET criteria but CS will not be supervising their measurement and direct assessment. Program
Educational Objectives have been reviewed in the annual procedure as part of the CS Advisory Board’s meeting (approved as is) and several other constituencies through informal surveys, other assessment tools, and the student meetings with faculty in late May 2014. The changes will be reflected in 2014-2015.

b) the identification or clarification of the relation between major and UCC courses/programs, between major courses and those in other disciplines;

- In accordance with suggestions of the ABET examiners, the chairperson has adopted in October 2013 a stricter policy of prerequisite-waiver adherence and documentation. Unless students provide documented proof of prerequisite completion at prior institutions, challenge exams, or a comparable equivalent, the prerequisite-waiver will be refused, even if it has the support of the advisor and instructor. So strict adherence by ABET was written, so it shall be done!

- All our UCC course syllabi have been revised to incorporate additional learning outcomes for technology intensive and writing intensive purposes. All the latest course outlines and student learning outcomes are posted on our department website for easy access. Please see http://cs-cit.wpunj.edu/cs/curriculum/ for details. Our Program Educational Objectives and Program Outcomes can be found at http://cs-cit.wpunj.edu/cs/program-objectives-and-outcomes.dot.

- The CS department website has the latest updates of curriculum control sheets, CS major and minor requirements, and CIS minor requirements. The Education majors can access the CS 2150 Proficiency Exam information via our department website. The web address of our department website is: http://cs-cit.wpunj.edu/. The CS 3380 change will be documented in the Summer 2014 revision of the curriculum control sheet.

- The assessment efforts, course and program development toward learning goals are discussed in the “Pedagogy” section and Appendix #2. Assessment results at the course and program levels give an indication of our students’ progress toward their learning goals. Most our assessment results and documents can be found in our Departmental ABET Accreditation website (http://cs.wpunj.edu/~abet/). (Note: some of the data are password protected at this site and any interested party who would like to see the course and program assessment data should contact the Department Chair at for access information.)

c) the identification or clarification of student progress toward learning goals of the major.

This has been addressed in the other subsections of this question. However, this is more an issue of advisement (for which we have two wonderful CS advisors and a chairperson who give extensive analyses of and elaborate direction in student progress on an individual basis, in a scrupulous and rigorous manner, oriented towards student success)
and WPConnect’s Degree Audit for continuous automated record keeping thereof. We do need greater utilization of some tools such as Early Alert and Advisor Notes as visible paper-trailing but students get plenty of feedback directly from faculty. Greater utilization ultimately requires a culture change in many parties over this enterprise.

3. Comment on developments in the introduction of technology into the curriculum.

Most of CS faculty either use the Blackboard Course Management System or their own web pages in our department server. Some faculty members prefer the security nature of Blackboard and the various tools it provides. Other faculty members prefer the more open and public nature of web pages. Web pages promote publicity, marketing, recruitment, and the reputation of our department. Blackboard is used by everyone for record keeping, by a tiny subset for exam delivery, and an even tinier one for near paperless operations.

All our classes are conducted in the CS labs with the latest smart classroom technology. With our move to the new Science Hall over two years ago, document cameras and multi-input PC-based projectors illuminate our students as they get hands-on learning activities/experience on the individual stations before them. All our major students and non-major students who take computer science course are given a flash drives and the opportunity to join Microsoft’s Alliance AKA DreamSpark. Webcams and headset applications are being used in the CS 2150 course.

Faculty

1. Comment on activities of the faculty that have enhanced the individual and collective excellence and reputation of the department.

The continuous research and scholarly activities, including the publications and presentations by our faculty member, enabled our faculty to become experts in their respective fields; they also enhanced and improved the reputation of the College of Science & Health and William Paterson University in general, and the Computer Science Department in particular. Please see more details in the “Research” section.

Our faculty dedicated immense efforts in undergraduate research. Our faculty have motivated students to work on mobile platforms (Linux, Raspberry, and other environments), as we dedicated 1.5 credits to mobile lab development, students autonomously started a mobile club, and our students even competed and gained recognition in regional competitions/contests.

Our faculty have had many research assistants. Dr. Su (in collaboration with Dr. Ku) has students engaged in the DSP (Digital Signal Processing) research project. Dr. Kaufman, although she retired from our department, continues working on her fiber optic research with some students. The research activities led by Dr. Su, Dr. Ku, Dr. Hu, and Dr. Wolz, made our department an intellectual environment for learning and the pursuit of knowledge in emerging areas of Computer Science and Associated Technologies.

Dr. Hu’s Virtualization Lab based on VMware is progressing and going into the development and
project phase. His team included student assistants but we have lost our part-time lab administrator, Marvin Kiss. His lab provides practical system administration experience to our students and in the future will have a key role in the curriculum. Dr. Wolz has been working on the Mobile Lab.

Dr. Hu and Dr. Najarian participated in WPU’s AIM High Summer Youth Program during the summer. Dr. Hu taught computer forensics courses and Dr. Najarian taught a course on computer game design and programming. Dr. Ku is developing one in Virtual World. Dr. Wolz is formulating another camp. Marvin Kiss also offered one and also facilitated in Dr. Najarian’s one with great student discovery and enthusiasm. This program attracts top-notch high school students to WPUNJ, giving visibility to and enhancing the reputation of our department.

The scholarly and creative activities of our faculty and faculty services, all contributed to the collective excellence and reputation of the CS Department. These are mentioned elsewhere in this document and in the Individual Faculty Achievement reports.

2. Comment on developments, changes, and activities related to faculty that have assisted the department in meeting its instructional goals.

Our department has a several procedures and active processes to maintain our ABET accreditation status. This process has been discussed and reviewed frequently throughout the year in our department meetings, Assessment Committee meetings, and Curriculum Committee meetings. One of the activities of this process is the preparation of the course binders for all the CS major courses which contributed to the improvement and enhancement of the course materials and pedagogy. This activity affects the faculty and department in meeting its instructional goals. Changes by individual faculty occurred in course pedagogy, which are cited above. Individual Faculty Achievement reports elaborate on this as well.

3. Comment on faculty service in the context of departmental, college, and university goals.

The departmental, college, and university goals of teaching, research and creative activities, and service missions were achieved through the various services performed by our faculty. Excellent volunteer spirit exhibited by our faculty members. These faculty services are summarized below:

**Department Level:**
During this past year, all of our faculty were actively involved in our preparation for the ABET re-accreditation visit and the aftermath. This involved detailed preparation of documents (reports and course binders) and scheduled activities. The ABET evaluation team came and for three days reviewed our documentation, accessed our online resources, and interviewed several administrators, all CS faculty, our staff, some Science and Math faculty, students, alumni, and others. Faculty and institutional excellence was duly recognized. The sources of potential problems were in the documentation of procedure/decisions and fine tuning issues in policy enforcement verification over transitional periods. All those have been rectified. In assisting the chairperson in these and the ABET self-study, the visit, the aftermath, and corrective measures to address the concerns just cited, the arduously attained accomplishments of Dr. Ndjatou and Dr. Ku. are greatly appreciated and recognized as particularly meritorious.
The collaborative relationship with the UPS Information Services resulted in the pending funding of $10,000 per year and the provision of internships for our students was another major achievement of Dr. Ku. Dr. Wolz and other faculty have made arrangements to accommodate their representatives in forums promoting student professional growth and career development.

Another positive trend in our department is that the upward monotonically increasing number of CS majors for the past five years. All these achievements were the results of extra-curricular activities of our faculty’s volunteerism and service.

The individual faculty services to the department are listed below:

- **Dr. Cheo:**
  - Served in the Curriculum Committee, Department Council, DFRAC, Faculty Recruitment Committee, and Teaching Scheduling Committee.
  - Coordinator of the department tutoring program.
  - Served as an Independent Study Coordinator.
  - Course coordinator for CS 2010.
  - Faculty Advisor for the following student organizations:
    - SGA Computer Science Society since Fall 1978.
    - WPUNJ ACM Student Chapter since July 1974 (organized ACM Student Chapter events)

- **Dr. Hu:**
  - Served in the Assessment Committee, Curriculum Committee, Department Council, Faculty Recruitment Committee, Promotion Committee, Retention Committee, and Teaching Scheduling Committee.
  - Served as the Lab Administration Director. Supervised a group of student lab assistants and a part-time Lab Administrator (Marvin Kiss) to provide uninterrupted computing for departmental instruction and research. He also further developed the Virtualization Lab.
  - Served on the Assessment Committee of the College responsible for filing the annual assessment report of the Department to the College of Science & Health.
  - Served as the Academic Advisor for our students with Dr. Ku. Advised approximately eighty students for the academic year.
  - Developed two summer camp courses and taught one of them for the Aim-High Summer Programs to selected high achieving high school students.
  - Promoted and participated in discussions with CPE to develop certification programs with our department.

- **Dr. Ku:**
  - Facilitated ABET re-accreditation. This includes serving as the web master for our department website. Updated all the pages of our website during the year. In addition, he updated our department ABET website as a continuing process to maintain our ABET accreditation status.
  - Facilitated transitioning of chairpersons and the start of the second dynasty.
Facilitated the 1-Year job hunt in the summer.

Served as our representative to TAC (Technology Across the Curriculum) University Committee in his unique inimitable style.

Built ties with and is expected to obtain contributions of $10,000 per year from UPS Information Services for the CS Department. Also actively worked on UPS Internship development, sending many of our students to their internship program. He invited Kathryn Wentalik of UPS to talk to our students about internship and job opportunities at UPS Information Services. He also invited our alumnum, Adam Platt to share with our students about his work experience.

Served in the Teaching Scheduling Committee, Retention Committee, and Faculty Recruitment Committee.

Served as the CS Faculty Senate Representative

Served as a member of the Assessment Committee for Tenured Faculty (DAC), evaluated one candidate (Dr. Hu).

Served as the Academic Advisor for our students with Dr. Hu. Advised approximately eighty students for the academic year.

Worked with CPE on the possibility of certification programs.

Facilitated in the CS Advisory Board Meeting.

Participated in the CIS (Computer Information Systems) Day at PCCC (Passaic County Community College), presenting our new CIT major and talked to the department chair, faculty, and students at PCCC about our new major.

Participated in the Majors/Minors Day to recruit students into CS major and introduced our new CIT major option to WPU students.

Obtained two Student Worker Funds (fall and spring semesters) from the College of Science and Health to support two research assistants (Michael Moschovas and Jordan E. Matos).

Served as an Internship Coordinator, supervising an internship for a student (Christine M. Potenza).

Promoted student activities so that our students would have a positive experience, volunteering as a judge for the Mobile Club – a student organized club for mobile application development.

Supervised the senior thesis for a Cognitive Science Honors College Track student, Daniel J. Molczyk. His thesis was titled “ELPH: Prototype Therapy Chatbot for Subclinical Stress in College Students”. Dr. Learmonth of the Psychology Department was the co-advisor for the thesis.

Dr. Najarian:

Served as the Chairperson of the Computer Science Department for the second dynasty.

Organized the ABET re-accreditation visit and the endless aftermath.

Organized the CS Advisory Board Meeting and communicated with the board members throughout the year on issues relating to course/program development, internship, seminars, and student recruitment. This includes reviewing PEO’s and PO’s in terms of institutional, college, and departmental missions as well as addressing the needs of constituencies.

Conducted the job search in for the 1-Year position in Summer 2014 upon Dr.
Leberknight's departure.

- Successfully academically- and professionally- promoted the CIT Program Proposal at the Board of Trustees level. He appreciated the erudition, academic guidance, the keen poignant insights and professional decorum of the event. It was an honor and privilege to be receive their enlightenment and wisdom.
- Evaluated the teaching of almost all adjuncts (Kenneth Mix, Jiseok Han, Jaehyun Kim, Puiking (Teresa) LauChan, and Costabile (Gus) Raso) and our one-year full-time faculty, Dr. Ursula Wolz. All were carefully selected with impeccable histories of teaching excellence, academic gravitas, proactively adaptive teaching styles, and dispositions/deportment generating student affinity.
- Organized the annual UPE Computer Science Honor Society Induction Ceremony.
- Served as chair of the Assessment Committee for Tenured Faculty (DAC), evaluated one candidate (Dr. Hu).
- Served in the Teaching Scheduling Committee, DFRAC Committee, Faculty Recruitment Committee, and Promotion Committee.
- While not formally in the Curriculum Committee, this chap attended every meeting, worked on ABET re-accreditation activities, and promoted CS 3380 Networking as a required course of the major, with CS 3720 becoming an elective, undercutting his own favorite course.
- Served as the Department Recording Secretary.
- AFT Representative for our department.
- As Upsilon Pi Epsilon Faculty Advisor, inducted ten students and a faculty (Dr. Leberknight) last year, which was a record as the largest group of inducted honors students per year in our department history. This year, we had seven, with two abstaining (curious).
- Participated in all the In-Person Registration Days.
- Participated in all of the recruiting events such as open houses and Majors/Minors Day.
- Participated in the CIS (Computer Information Systems) Day at PCCC (Passaic County Community College), presenting our new CIT major and talked to the department chair, faculty, and students at PCCC about our new major.
- Advised many students, especially during the summer. He held special advisement session for those students who could not meet with their regular advisor.

- Dr. Ndjatou:
  - Served in the Assessment (chair), Curriculum Committee (chair), DFRAC, and Faculty Recruitment Committee (chair).
  - As the chair the faculty Recruitment Committee, he successfully coordinated the recruitment efforts of the CS department to fill a tenure-track faculty position.
  - As the chair of the department Assessment Committee and the ABET coordinator, he collected and organized the SLO assessment data, prepared the SLO assessment documentations, coordinated the SLO assessment efforts of the department and prepared and organized the SLO assessment reports for the ABET accreditation visit. He also established the procedure to collect and organize the assessment data for the SLO of the BS degree program in computer science.
  - As chair of the Curriculum Committee, coordinated efforts preparing for the
ABET visit and in its aftermath, as well as spearheading the corrective actions and responses to ABET’s initial report. Also supervised the forum for creating CS 3380, promoted its replacement of CS 3720 as a requirement, developed CS 3990 Java web development, and other movements towards currency and the Networked Information Age.

- Secondly, as the chair of the Curriculum Committee, he created a new Course Coverage Assessment Report form that will be used in the course coverage assessment of all CS courses.
- Served also as a member of the COSH Curriculum Committee
- Served as coordinator of CS 2150.
- Making progress in the implementations of the two new courses, CS4051, Internet Applications with Java; and CS4201 Database-Driven Web Applications.

**Dr. Su:**
- Served in the Assessment Committee, Curriculum Committee, Department Council, Faculty Recruitment Committee, DFRAC, and Promotion Committee.
- Served as a member of the Assessment Committee for Tenured Faculty (DAC), successfully evaluated one candidate (Dr. Hu).
- Served as the Library Liaison for our department. Coordinated new collection acquisition recommendations to the Cheng library. Updated and promoted the currency of our library resources for ABET’s examination.
- Advised four CS students’ research work, specifically Taha Teke, Hussain Razzak, Jared Van Dyk, and Daniel Molczyk. Jared Van Dyk and Daniel Molczyk obtained SURP (Undergraduate Student Research Award) in F2013, while TahaTeke obtained SURP in S2014, and Hussain Razzak will obtain SURP in F2014. All of them worked for multi-core Digital Signal Processing (DSP) project. Daniel Llerena and John-Michael Leemans obtained student worker funding from May to June 2014 from the Dean.

**Dr. Wolz:**
- As a new faculty member, Dr. Wolz has been exempt from committee responsibilities. However, she attended many meetings, training sessions, and presentations.
- Dedicated time and effort to promoting the Student Mobile Computing club.
- Coordinated the usage of the mobile lab facilities and resources.
- Supervised two internships in Fall 2013 and developed industrial ties.
- Initiated and conducted the robot finch migration to WPUNJ. Among this many activities associated with this venture, CS students got an opportunity to actually work with robot finches.
- Developed interdisciplinary ties with other departments and industries.

**College Level:**
- Dr. Hu served on the college-wide Assessment Committee responsible for making sure the department has conformed to the assessment guidelines of the college, the University, and ABET accreditation. Produced the annual departmental Assessment Committee Year End Report.
- Dr. Najarian served in the CfR (Center for Research) Committee. He also served in the Safety Advisory Committee.
- Dr. Ndjatou served in the College Curriculum Committee.

University Level:
- Dr. Ku served in the following university-wide committees: Strategic Plan Committee for David and Lorraine Cheng Library. Member of the Advisory Board for the Career Development and Gloria S. Williams Advisement Center.
- Dr. Ku served as the Faculty Senate representative for our department.
- Dr. Su served a member of SURP (Student Undergraduate Research Program) Committee.

4. Comment on developments, changes, activities related to faculty that have assisted the department in meeting its diversity goals.

The number of CS faculty in our department over the span of the last several years is:

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<th>Year</th>
<th>Fall 2006</th>
<th>Fall 2007</th>
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Our current faculty consists of one African American, two Caucasian, and four Chinese American faculty members. Our adjunct faculty for the past academic year consists of two Caucasians and five Asian Americans.

One (Dr. Cheo) out of seven faculty members was the only female last year and she has announcement that she would be retired within what is now two years. This made the last three retirements all women; we seriously need to recruit in this now critically (though unintentionally, based purely on statistical circumstance) under-represented category. When Dr. Leberknight left for a higher paying position elsewhere, Dr. Wolz was hired, as a one year appointment. She improved the situation for one year. Since it is not a tenure-track position and the year is over, we will return to the ratio of 6 to 1. We made this a priority in our faculty recruitment this year but to no avail. Given the gender demographics in the job applications, even our strong support of gender diversity and our waiting for sizeable candidate pool did not resolve the problem.

In terms of student diversity, it is a national trend that the ratio of female to male students in the computing field is low. In fall 2012, our department has 18 female students out of 197 students (9%). The situation has not changed significantly in the last year.

5. Comment on quality of life in the department as it fosters faculty well-being, commitment, satisfaction,
and achievement of collective goals.

This past year was the third academic year since we have relocated to the renovated Science Hall East. Our teaching and research environments are optimal, even paradisiacal, and any memories of the decrepit, dilapidated, demolished, and disintegrated old Coach House have vanished, passing into oblivion as did the mainframes of old. We welcome this golden age of computing, inspired by the new pinnacles to attain and the sheer exhilaration of the academic challenges ahead with new theories unfolding, deeper insights to learn, and technologies beyond our wildest aspirations.

Just like any group of human beings in any endeavor, politics and self-interests among a miniscule subset of faculty members are unavoidable. All our faculty members have engaged students in different activities beyond the classroom such as research, lab administration, tutoring, student clubs, and advisements.

The good news is that all faculty members worked together to achieve our collective goals in seeking ABET re-accreditation, progressing towards final approval of our CIT major proposal, and recursively refining our courses and pedagogy, honing our expertise as teachers with continuous assessment and improvement. As perfection is the limit of recursively enumerable sets, so our dedication to higher education takes us on an unbounded journey. The “Seven Principles for Good Practice in Higher Education” serve as our paragon and unifying doctrine.

**Students**

1. Briefly characterize the qualitative and quantitative composition of the department’s majors; describe changes over the past year and outline any changes anticipated for the coming year.

The following table shows that the number of CS majors in our department for the past few years. The enrollment demographics of CS majors is monotonically increasing by 80.34% from fall 2008 to fall 2013. It has been in this upward trend every year for the past six years. We anticipate that the enrollment continues to go upward as job demand in Computer Science is relatively high and new directions for development arise.

<table>
<thead>
<tr>
<th>Year</th>
<th>Fall 2008</th>
<th>Fall 2009</th>
<th>Fall 2010</th>
<th>Fall 2011</th>
<th>Fall 2012</th>
<th>Fall 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td># of CS Majors</td>
<td>117</td>
<td>118</td>
<td>144</td>
<td>172</td>
<td>197</td>
<td>211</td>
</tr>
</tbody>
</table>

The number of CS majors is affected by job prospects, the current economy, and numerous other factors. Another aspect of enrollment in our program is that the Computer Science major is a theoretical discipline that requires rigorous training in mathematics. Some of our students are not quite mathematically trained or not oriented toward mathematics. However, these students are proficient in the applied, technological, or more practical aspects of computing. Our new CIT major will help our student retention efforts by creating options. Students with technological interests but different abilities, knowledge domains, experiences, and skill sets can more exactly map them to particular professions in IT and their associated expectations. This was recommended by a previous CS program review and reflected in last year’s external consultant’s review of the CIT proposal.
2. Describe steps taken by the Department to change, either qualitatively or quantitatively, the composition of its majors through initiatives in admission, recruitment, and retention.

The CIT Program just cited will modify this, redirecting technology students to CIT instead of CS. This will improve retention by avoiding prolonged graduations and prevent attrition by disillusioned or disinterested whose true career should have been IT.

We need to put more efforts in recruitment and retention. In the past, we have formulated the twenty-step Recruitment and a separate Retention Plan, and several revisions and new versions of the list. Reinventing wheels is fine but the steps outlined in those documents require execution, time, and effort. With limited resources, they are not feasible in totality. Problems with timing and coordination of events have plagued these efforts in the past and their correction, while not hard, need to be instituted. Student Recruitment Strategy, the dual of retention, is less formalized and still under-addressed. We used to have two open-houses and two mini-classes per year but even those are only internal and generalized tactics. More uniform outreach, developing external ties, and off-campus expositions may significantly augment and expand recruitment efforts. The UPS initiative that Dr. Ku is working on is one such success. Other outreaches, such as the robot finch project of Dr. Wolz, generate great publicity and interest in CS at our institution. The SGA student society, the ACM student chapter, and the UPE CS Honors society.

Here are some tough questions:
- Who will visit the local high schools? We did some in the past.
- How likely is it that we can develop clubs there?
- How do we reach the high school counselors and advisors? These are the people who influence students most, second to parents and students, but more profitable than either, since one parent may decide for one student but a HS college advisor would affect a whole high-school. We used to bus them here, separate events for counselors and students.
- We used to have a Science Day, bussing in high school students to observe student poster presentation and some faculty exhibition lectures. Is that possible now?
- The idea of mass mailings or emailings is acceptable but “education-marketing” requires a more individual, intellectually substantial, and personal process. Multimedia with sensory stimulation should be used to give it appeal and a modern style but we need to stress scholarship, professional growth potential, capturing the imagination of the present generation’s, and engaging students. This requires more convincing/time and showing that we care and offer genuine, personally customized plans for professional growth. While web pages have been extensively upgraded, more work is still needed. The data on more than half of the CS faculty web pages is Spartan and static, even after the ABET visit. We need to upgrade them. Perhaps this summer…

This process of recruitment is exhausting and year-round process, summers included. Every new student is getting more custom treatment than ever. From greeting parents and students to on campus visits to phoning all prospective students to filling forms for students to facilitate their entry, the process puts a heavy strain on chairs. From the start, every promising student is informally informed of special opportunities and directed to a research group and lab-assistant/tutoring positions. Summer pre-advisement of transfers is now a
Recruitment:
Dr. Hu, Dr. Ku, Dr. Najarian, and Dr. Su always volunteer for various functions organized by the Admissions Office such as In-Person Registration Days, Open Houses, Scholarship Student Brunches, and Majors/Minors Day. Dr. Wolz has also joined us on occasion.

Dr. Hu, Dr. Najarian and Marvin Kiss participated in the William Paterson Summer Youth Program last year. This program was attended by top-notch local high school students and so this activity will optimistically recruit some future students into our program. Dr. Ku and Dr. Wolz will join us in Summer 2014 as we expand our offering.

Dr. Ku has updated all the relevant information on the CS Department website throughout the year. When potential students look for programs or colleges, the internet is usually the first place where they will look for information. Department websites are important recruiting tool, often of first contact. Information rich and compelling websites attract repeated visits

3. Describe and comment on any developments or changes in the department’s non-major service.

Many students are opting into the CS and CIS minors. To support them, we are applying lenient waivers to permit students to take alternate courses in CS to fulfill their minors in time for graduation.

In the UCC domain, we have strong and growing enrollments in CS 1300 and CS 2010. These Technology Intensive courses have seen a growing enrollments and we need to accommodate them further this year and in the future.

Dr. Ku presented a lecture “Artificial/Machine Intelligence: An Overview” to the Cognitive Science I (CGSI 2000) class of the Honors College. His supervision of theses in that sector is an annual continuous process.

4. Describe and comment on any developments or changes in the relation between students and departmental resources (including course enrollments, credits in the major, etc.).

The currency trend towards Networking and unprecedented re-offering of CS 3990’s “Selected Topics” every semester for the last three years led to the creation of CS 3380. This course is now a regular offering. Its requirement in the CS major was cited above at length.

Our department offers several non-major courses. Due to the technology intensive nature of CS 1300 and CS 2010, the enrollment of these two courses continues to increase. Given limited resources and adjuncts, we need to reach a balance between instructional workload/availability and full sections turning away students since they are closed. These two non-major technology intensive courses continue to be in high demand. Our department should consider offering more sections in the future.
The Department of Elementary and Early Childhood Education changed their requirement for CS 2150. Their major only requires this course for students enrolled before September 2011. All other students in the education major can use this course to satisfy the technology intensive requirement. In fall 2011, we offered 4 sections of 2150. Two years ago, we offered 3 sections in each semester and the classes were not filled to capacity. The decline is even more drastic and progressive. We may need to meet with Education, either to discuss a renewed commitment, consider consolidating CS 2150 with CS 2010, or some other option.

5. Describe and comment on developments, changes, activities that have assisted the department in increasing the diversity of students in the major (e.g., recruitment efforts or changes in course offerings/area of concentration).

The recruitment effort with respect to diversity has been a serious concern in the department. We will need to dedicate more effort in this avenue of opportunity; in the past, we had several measures and contacts on campus to promote CS to underrepresented groups. Grants, scholarship support, and other education initiatives warrant revisiting.

A major development that will affect the diversity of our students is our new CIT major. One of the reasons students are leaving the CS major is because they are not mathematically prepared or inclined. Some just need encouragement and to become more aware. Others need to redirect their focus towards CIT. With this CIT major, our students will have a choice of a theoretical degree in CS major or a practical, application oriented degree in CIT major. We hope this CIT major will help our retention and diversity efforts.

During this past years, Dr. Ku worked with the Asian American Business Resource Group at UPS Information Services to have a panel discussion and networking session for our students. The session was very successful where UPS Asian American employee-mentors shared their experience in the corporate industry with our students. This diversity activity made our students aware of diversity issues in the information technology industry. The department needs to dedicate more effort and time in that direction.

6. Describe and comment on efforts in the department to promote student academic achievement (e.g., advisement, involvement in research, internships, extra-curricular activities, major based honors society or club).

Dr. Hu and Dr. Ku served as our departmental advisors for this past academic year while Dr. Najarian advised students during the summer. Other faculty members are also helping out. For example, students working with a professor in a research group usually ask that particular professor for advice. Many faculty members in our department identified our weak students and interact with other members on how we could help those students. Likewise, professors identified good students for research, internships, tutoring, or computer lab administration positions in our department, funneling them towards great opportunities for germinating careers. Our benevolent community of scholars is sponsoring student success, each individual at a time.

The student clubs of SGA Computer Science Society and ACM (Association for Computing Machinery), are important functions for professional growth and an integral component of the
college experience for our students. Dr. Cheo is the faculty advisor for these organizations.

Student tutors and lab administrators/assistants are another channel for the professional growth and experience for our students. Students can teach, learn, and get paid in the process. Dr. Cheo is the faculty advisor for student tutors and Dr. Hu is the faculty advisor for the student lab administrators. We are thankful for the Dean’s support of these important opportunities for our students, both tutor and client. Many tutors and student lab administrators gravitate towards research, as noted in the “Research” section.

Our department selects the recipient of the Omicron Omega Award for Excellence in Computer Science every year. This award is given to the best (highest GPA) graduating senior in the CS Department. For the academic year 2013-2014, the recipient was Daniel J. Molczyk. His contributions as a tutor and student researcher further confirm our decision.

To promote student academic achievement and provide opportunities to our students, we always use email to send out research, scholarship, internship and job opportunities to our majors.

These last two years have seen a record numbers of Upsilon Pi Epsilon (UPE) Computer Science Honors Society inductees. We inducted 10 students and one faculty (Dr. Leberknight) in Spring 2013, an all time maximum for our department. This spring (2014) had 7 inductees because two didn’t accept out of 9 (with very strange reasons given).

7. Describe departmental activities in support of the assessment of student achievement and student satisfaction.

Assessment is a major activity for our continuing effort of maintaining ABET accreditation, benefiting not only faculty and our program but our students as well. Most of the activities performed by our faculty directly affect student satisfaction. Besides teaching, this includes faculty-student research and all other departmental operations.

Dr. Hu served in the College Assessment Committee and he reported our departmental assessment activities in the year-end report (Appendix 1). To assess student achievement and satisfaction, five different types of surveys are periodically conducted and the results are evaluated for the improvement of our program and the enhancement of student satisfaction:

(1) Student Course Evaluation – This is the standard form of course/teacher evaluation and the results are compiled by the Office of IR&A at WPUNJ.
(2) Pre- and Post-Semester Surveys – This is course based (qualitative and subjective) survey conducted by our faculty. The data will be used quantitatively and objectively to assess our program outcomes. The results are compiled and accessible by faculty members in our secured department ABET accreditation website (http://cs.wpunj.edu/~abet). This is part of the instructor assessment included in the course binder.
(3) Senior Exit Survey – This survey is given to our graduating seniors to ask about their experience in our program. The survey results can be access from our secured department ABET accreditation website: http://cs.wpunj.edu/~abet.
(4) Alumni 1-Year Survey – This survey is conducted by IR&A.

To support student satisfaction, the department has numerous activities conducted by the research groups, student clubs/societies, tutoring service, lab team, et cetera. All of them have contributed to student satisfaction. Several seminars were organized for our students during this past year to enrich their intellectual pursuits. These are also key to our retention efforts.

**Pedagogy**

1. Describe departmental pedagogical initiatives. Specifically, comment on departmental efforts to encourage active and collaborative learning and to create a learning environment conducive to a variety of teaching and learning styles.

   As part of our on-going ABET accreditation maintenance efforts, our department has active and collaborative learning strategies in place. We have course coordinators for multi-section courses. We also coordinated different courses or course sequences to bridge the concepts and topics. The following courses have been improved in terms of course contents or pedagogy by different faculty members during this past academic year.

   The mapping / assignments for course coordination and assessment/improvement for 2013-2014 was:
   - CS 2010: Dr. Cheo and Dr. Su
   - CS 2150: Dr. Ndjatou
   - CS 2300: Dr. Cheo, Dr. Hu, and Dr. Ndjatou
   - CS 2400: Dr. Hu and Dr. Ndjatou
   - CS 2600: Dr. Najarian
   - CS 2800: Dr. Su
   - CS 3380: Dr. Najarian (Network Fundamentals and Net-Centric Computing)
   - CS 3410: Dr. Su
   - CS 3420: Dr. Hu and Dr. Ndjatou
   - CS 3450: Dr. Najarian and Dr. Ndjatou
   - CS 3500: Dr. Ku
   - CS 3720: Dr. Cheo
   - CS 3820: Dr. Ndjatou
   - CS 3990 (Computer & Network Security): Dr. Hu and Dr. Wolz
   - CS 4020: Dr. Najarian
   - CS 4040: Dr. Najarian
   - CS 4100: Dr. Ku
   - CS 4300: Dr. Hu
   - CS 4400: Dr. Ku
   - CS 4450: Dr. Najarian
   - CS 4610: Dr. Najarian
   - CS 4800: Dr. Wolz

   For all these courses, each individual faculty member has extensive assessment reports,
statistics, and documentation of their respective courses. The feedback collected and statistically analyzed from the various assessment activities resulted in many pedagogical initiatives and improvements. Pedagogical initiatives were frequently discussed in the Assessment Committee, Curriculum Committee, and forums in department meetings. Course binders for each major CS courses were prepared. These binders consist of course syllabus, homework, projects, tests/quizzes/exams, as well as instructor’s self-assessment of the course. All these (except for the course binders, which are physical and massive) can be found in our departmental ABET accreditation website: (http://cs.wpunj.edu/~abet/). (Note: some of the data is password protected at this site and any interested party who would like to see the course and program assessment data should contact the CS Department Chair for access information.) Please see the Individual Faculty Achievement reports for details of the course content and pedagogical improvements of the above courses.

2. Describe and comment on departmental initiatives related to the evaluation and improvement of teaching.

Assessment is one of the driving forces in our department activities and decision-making. Besides the pedagogy initiatives described above, extensive teaching improvement and course evaluation initiatives were carried out. As mentioned above recurrently, we have prepared course binders for each course we taught, as part of our on-going efforts to retain ABET accreditation. All the major CS courses last year had course binders available for the fall 2013 ABET visiting team. Each binder has an instructor self-evaluation/ assessment form for the purpose of curriculum and teaching improvements.

Actually, we often exchange notes, methodologies that work, and ideas on particular coursework, textbooks, software, and other pedagogical material in informal meetings and discussions. CS faculty chat and free share course material, strategies, textbooks, projects…, spontaneously. Sometimes it is just forwarding an email FYI with hyperlinks.

3. Describe departmental sponsorship of or participation in opportunities for the enhancement and diversification of pedagogical skills.

We have many formal discussions regarding pedagogy in our department meetings, Curriculum Committee meetings, and Assessment Committee meetings. Again, assessment efforts ultimately motivate and direct some changes in pedagogy. Assessment effort is a built-in process through our ABET accreditation maintenance effort. Our assessment efforts described throughout this document are beneficial in this regard.

We genuinely appreciate the periodic webinars and other links emailed by Associate Dean Jean-Fuller Stanley. CS faculty frequently exchange CS domain knowledge and research. However, general pedagogical material (such as brain-learning studies, best practices of the 100 top teachers, …) are rarely mentioned. Hence, such emails are welcome.
Research

1. Comment on research, scholarship, and creative activities of the faculty.

The research, scholarship, and creative activities of the faculty are summarized below. Several faculty members solicited student assistance and compensated students through their various grants/funds. As mentioned in the “Faculty” section, these activities really established and enhanced the reputation of the CS Department, college, and university. These activities also demonstrated the currency in the disciplines of our faculty members.

Dr. Ku:

Journal Article:

Conference Papers:


Presentation:

Dr. Hu:

Erh-Wen Hu, “Instruction Level Loop De-optimization – Loop re-rolling and Software De-pipelining”, coauthored with Bogong Su) was presented on Scholarship Day held on
campus on April 3, 2014.

- Erh-Wen Hu, “Parallel algorithms, multithreading, multicore Systems and performance evaluation”. (Research in Progress)

- Erh-Wen Hu, “Evaluation and Visualization of the Performance of Multicore Processors. (Research in Progress)

**Dr. Ndjatou:**
- Gilbert Ndjatou, “Learning in a System of Knowledge-Based Agents”, a paper, is being revised for a future submission to a journal. (Research in Progress)

**Dr. Su:**
- Bogong Su, “Instruction level Loop De-optimization -- Loop Rerolling and Software De pipelining” presented on Scholarship Day, coauthored with Dr. Erh-Wen Hu.

- Bogong Su, “Performance Study of Multi Core System”, presented by two advisees Daniel Molczyk and Jared Van Dykon Scholarship Day

- Bogong Su, “Instruction level Loop De-optimization -- Loop Rerolling and Software De pipelining” co-authors: Dr. Hu, I and Dr. Wang in Ericsson (Research in Progress)

- Bogong Su, “New Technology of Performance Prediction of Multi-core DSPs” (Research in Progress)

2. Comment on research, scholarship, and creative activities of students in the major.

There is always strong faculty-student interaction and collaboration in our department. The foremost research group with student involvements is the Digital Signal Processing (DSP) Research Group led by Dr. Su. Although Dr. Kaufman has retired from our department, she continues her research and supervised couple students.

**Dr. Su:**
- Bogong Su, “Performance Study of Multi Core System”, presented by two advisees Daniel Molczyk and Jared Van Dykon Scholarship Day

- Bogong Su advised four CS students’ research work, specifically Taha Teke, Hussain Razzak, Jared Van Dyk, and Daniel Molczyk.

Jared Van Dyk and Daniel Molczyk obtained SURP (Undergraduate Student Research Award) in F2013, while TahaTeke obtained SURP in S2014, and Hussain Razzak will obtain SURP in F2014. All of them worked for multi-core Digital Signal Processing (DSP) project. Daniel Llerena and John-Michael Leemans obtained student worker funding from May to June 2014 from the Dean.
3. Comment on grants-seeking activities of the faculty.

**Dr. Ku:**
- Worked with WPU Institutional Advancement and awarded $10,000 ($5,000) per semester for the 2014-2015 academic year from UPS Foundation to support a Computer Information Technology Lecture Series.
- Worked with WPU Institutional Advancement to seek funding from AT&T Foundation and PSEG Foundation to support the Pre-College Math, Technology, and College Enrichment STEM HIGH Summer Program. Dr. Ku proposed couple computer courses to support this effort (collaboration between the CS Department and CPE – Center for Continuing and Professional Education)
- Worked with Dr. Wolz on her NSF grant proposal on the using of technology (mobile applications) to change habits (behavioral modifications).

**Dr. Wolz:**
- Worked with Dr. Ku on an NSF grant proposal on the using of technology (mobile applications) to change habits (behavioral modifications).

**Community Service**

1. Describe departmental outreach or collaboration initiatives in community service.

   Dr. Wolz and Dr. Ku served as Internship Coordinators (2 and 1 respectively).

   Dr. Hu, Marvin Kiss, and Dr. Najarian participated in the WPUNJ’s AIM High Summer Youth Program in Summer 2013. Dr. Hu, Dr. Najarian, Dr. Ku, and Dr. Wolz will be instructing at the AIM High Summer Youth Program in Summer 2014.

   Dr. Hu and Dr. Ku had discussions with CPE (Continuing and Professional Education) on the possible development of certification programs for our students and our community.

   Dr. Ku worked with Institutional Advancement, further developing an excellent relationship with UPS Information Services. He obtained funding, internships, and implemented other activity (networking forum) with them.

   Dr. Ku set up the following three seminars for our department:
   - Christine Potenza (WPU Student) – “Enterprise Information Services Student Position”, April 29, 2014.
   - Kathryn Wertalik (UPS) – Kathy talked about internship and job opportunities at UPS Information Services.
Dr. Wolz conducted several outreaches, both interdisciplinary and external.

Our department conducted the annual Computer Science Advisory Board meeting in April 2014 and we will continue communicating with them for advisement on certain matters such as new course development, internship opportunities, and student retention. We reviewed Program Outcomes and Program Education Objective to determine if they still coincide with the missions of the university, college, and department relative to all applicable constituencies. The conclusions were positive on the PEO’s and the PO’s were modified in accordance with ABET in outcomes associated with Math and Science assessment.

2. Assess the outcomes of these initiatives.

UPS is expected to give the CS Department $10,000 per year (starting in the coming academic year) to establish a lecture series and provide other support for our department, especially in terms of developing CIT. During the past years, UPS Information Services had given our students and alumni wonderful opportunities for career development and professional growth. Such benevolence is a most noble and generous virtue.

In terms of the campus community, we devoted much towards establishing our department’s good reputation and collaborative collegiality. The internal reputation is important as it extends outward to the local community and beyond. Internships and collaboration with outside colleges or companies enhance our reputation and visibility. We will continue working in this regard with the Computer Science Advisory Board.

Resources

1. Identify and explain how the department’s allocation of resources (staff, computers and other equipment, library, travel, supplies, facilities, other), during the past year, reflects the department’s priorities.

   Staff:

   We appreciate the faculty line associated with our faculty search. As the department went from 9 faculty to 7 and then to 6, the 1-year position and then the tenure-tracked one addressed a critical shortage in workforce. While correcting the present situation, given the announcement of one faculty’s intent to retire, we will soon need another faculty search in the department. CIT is projected to need one in four years as well.

   A more difficult question remains: With the loss of Marvin Kiss, our lab administrator, our lab support is in crisis. While operations continue smoothly, services are falling behind schedule and any serious problem will prove devastating; we need more lab staff just to achieve stationary homeostasis.

   Even in his first year of the second dynasty, the chairperson exhibits symptoms of combat
Computers, computers everywhere!
We are delighted to be replacing all our client computers in our labs and classroom this summer. In preparation for this, a completely modernized disk image plan has been compiled to address all needs both current and expected for the next few years. The process was exhausting but the plans are ready to deploy. The 3-year cycle works well and ABET recognized that.

Equipment:
Our equipment is fine except for the automatic staplers in the classrooms. We could use another scanner in the open lab. All the hardware equipment and software resources in our department are posted on our department website: http://cs-cit.wpunj.edu/cs/computer-science-labs.dot.

Library:
- Dr. Su is our Library Representative and he solicited our input for book acquisitions. We have a good collection of books that cover a variety of topics in the library for our students as well as for our faculty.
- We purchased some books and manuals for the lab and for faculty in direct support of the course instruction. Lab books and manuals are shelved in the CS Research Center (SCIE 5031) and in the server room (SCIE 5039).
- Should our tutors require any new books, we can fund some for curricular support. These books are stored in the Computer Science Learning Center (SCIE 5027).
- We maintain some journals and magazines in the book shelves of CS Research Center.

Travel:
Dr. Najarian traveled to Washington DC for ABET training in Summer 2013. Travel costs were kept to a minimum but all needs were addressed. The primary sources of travel costs were the in-person interviews for the faculty search. Skype was a cost effective way to pre-screen candidates to reduce the number of in-person interviews. This is the first faculty search in CS wherein Skype was used and it is integrated into our procedure henceforth.

Supplies:
- We have GoPrint software in all our labs. We supply all the papers for our labs but these labs are also used by other departments for classes. Our department secretary, Carol controls the supply of papers to these labs and it is a laborious task. Individual faculty brings paper to their respective classes. Unfortunately, this unwieldy solution is the only one we could implement.
- We distribute flash drives to our all our CS majors and non-CS major students who take CS courses. Likewise, we offer them the DreamSpark software academic alliance with Microsoft.
- Other notable supplies we acquired were the head phones and webcams for the CS
2150 classes.

- Our Xerox machine will have passwords assigned to each CS faculty. We have paid a heavy price for unauthorized or abusive photocopying. Publicly accessible Xerox machines must use passwords.

**Facilities:**
As noted above, we are genuinely appreciate our present facilities in Science Hall East’s fifth floor. Our labs accommodate our needs and were met with approval by ABET. SCIE 5035’s designation as a research lab is most vital to our program. Our department alone can schedule classes in this lab. No other department can schedule a there. This lab also has an important role in the implementation of our new CIT major.

**Other:**
We thank administration for support in this category.

2. Comment on resource support as it has limited or enabled faculty and students in the department in pursuit of excellence and achievement.

We are grateful for the support of the Dean’s Office with respect to Student Worker Funds for our students’ research activities and innumerable other situations.

With Dr. Leberknight’s departure and another faculty’s announcement of intent to retire in presently two years, our department is in jeopardy. The 1-year hire and the tenure tracked faculty position search are most appreciated. Currently, our total number of faculty is seven. We have 211 CS majors and so the faculty to student ratio is about 1 to 30. We would like to hire one or two more faculty members to make the ratio closer to 1:16 (which is the university average of faculty to student ratio). Especially for our new CIT major; we need to hire at least one additional faculty in the information technology or information science field. Another reason that we need new faculty hire is that we specified to ABET and in most open houses that all our major courses are taught by full-time faculty. However, we are realistic in our expectations and budgets are tight, so we will be conservative in economic planning.

**Assessment Summary**
Summarize the important ways in which the department and its programs have changed or developed during 2013-2014 based on assessment activities. Please note any formalized assessments related to accreditation and/or institutional program review.

Because of our continuing effort to maintain ABET accreditation; our department has a well-establish process for various phases of assessment for our courses and our program. Compiling of CS major course binders and the filling of various assessment forms are a routine process for our faculty. In other words, assessment activities are ingrained in our department. Please refer to the Assessment Report (Appendix 1).

The department has engaged in formalized assessment activities. The following template documents the linkage between goals and objective, student learning outcomes, assessment
methods and findings, and use of the findings for the purpose of program improvement:

<table>
<thead>
<tr>
<th>Program: B.S. in Computer Science</th>
<th>Student Learning Outcomes (SLO)</th>
<th>Assessment Methods &amp; Findings*</th>
<th>Using Assessment Results For Program Improvement**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic Program Goals/Objectives</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>1</strong> – Effectively communicate in written and oral forms</td>
<td>SLO in CS3410, CS3450, CS3500, CS3820, CS4410, CS4800</td>
<td>1, 2, 3</td>
<td>Course, Pedagogy, and Curriculum</td>
</tr>
<tr>
<td><strong>2</strong> – Demonstrate competence in mathematical skills (discrete structures, differential and integral calculus, and probability and statistics)</td>
<td>SLO in CS2600, CS2800, CS3720, CS4040, and math courses</td>
<td>1, 2, 3</td>
<td>Course, Pedagogy, and Curriculum</td>
</tr>
<tr>
<td><strong>3</strong> – Demonstrate an understanding of core scientific (physics, biology, etc.) principles and methods</td>
<td>SLO in science courses</td>
<td>1, 2, 3</td>
<td>Course, Pedagogy, and Curriculum</td>
</tr>
<tr>
<td><strong>4</strong> – Work effectively as part of a team in a software or hardware project</td>
<td>SLO in CS3410, C3500, CS3820, CS4410, CS4800</td>
<td>1, 2, 3</td>
<td>Course, Pedagogy, and Curriculum</td>
</tr>
<tr>
<td><strong>5</strong> – Demonstrate an ability to locate and make effective use of information</td>
<td>SLO in CS3450, CS3820, CS4800</td>
<td>1, 2, 3</td>
<td>Course, Pedagogy, and Curriculum</td>
</tr>
<tr>
<td><strong>6</strong> – Demonstrate an ability to select appropriate data structures and to design algorithm to solve program</td>
<td>SLO in CS3420, CS3720, CS4040 (also CS2300, CS2400, CS2600)</td>
<td>1, 2</td>
<td>Course, Pedagogy, and Curriculum</td>
</tr>
<tr>
<td><strong>7</strong> – Demonstrate an understanding of programming language concepts</td>
<td>SLO in CS3450, CS3820 (also CS2300, CS2400, CS2600, CS3420)</td>
<td>1, 2</td>
<td>Course, Pedagogy, and Curriculum</td>
</tr>
<tr>
<td><strong>8</strong> – Demonstrate an understanding of the major programming domains and the knowledge of the most appropriate programming language for each domain</td>
<td>SLO in CS3450, CS3820 (also CS2300, CS2400, CS2600, CS3420)</td>
<td>1, 2</td>
<td>Course, Pedagogy, and Curriculum</td>
</tr>
<tr>
<td><strong>9</strong> – Be able to develop programs in two or more major programming languages on at least two platforms</td>
<td>SLO in CS3450, CS3820 (also CS2300, CS2400, CS2600, CS3420)</td>
<td>1, 2</td>
<td>Course, Pedagogy, and Curriculum</td>
</tr>
<tr>
<td><strong>10</strong> – Demonstrate competence in computer organization and architecture</td>
<td>SLO in CS2800, CS3410, CS4410 (also CS3450)</td>
<td>1, 2</td>
<td>Course, Pedagogy, and Curriculum</td>
</tr>
<tr>
<td><strong>11</strong> – Demonstrate an ability to use software engineering principles to analyze and design large software projects</td>
<td>SLO in CS3500</td>
<td>1, 2</td>
<td>Course, Pedagogy, and Curriculum</td>
</tr>
<tr>
<td><strong>12</strong> – Demonstrate an understanding of ethical and legal issues for computing professionals and the impact of computing technology in society</td>
<td>SLO in CS4800</td>
<td>1, 2, 3</td>
<td>Course, Pedagogy, and Curriculum</td>
</tr>
</tbody>
</table>
While the above is the present model, to comply with the Fall 2013 ABET examiner’s concerns/findings, we have just voted in May 2014 to modify this document to reflect only measurable and controllable outcomes. This means we are shifting responsibility of Math and Science outcomes to their respective departments, so that the same courses are still required but we leave assessment to them. This was at the CS Advisory Board Meeting of 2014’s review of PO’s and PEO’s in CS.

Dr. Ndjatou has developed and established the procedure to collect and organize the assessment data for the SLO of the BS degree program in Computer Science. We reviewed and voted in favor of the revised model very recently, in May 2014.

II. PLANNING

Goals and Objectives

Outline in order of importance the major goals and objectives for the Department in 2014-2015

The prioritized schedule is:

1. Get the CIT major finally approved at the state level.

2. Upgrade the CS Lab in Summer 2014 (both the hardware and the disk image construction/deployment). This also entails getting more lab support staffing. We also need UNIX and DreamSpark account data-entry and maintenance.

3. Welcome and mentor Dr. Salimur Choudhury.

4. Promote Research

5. Promote Retention

6. Promote Graduate-in-4, as well as Graduate-period!

7. Develop the Master in Information Technology after CIT is well established.

8. Improve Assessment

9. Improve Student Recruitment

10. Improve web pages.
11. Promote currency.

12. Promote X-Windows

**Resources**

Comment on resource implications and identify resource management plans for realizing the goals and objectives plans for 2014-2015

The current resources are adequate for achieving our major goals and objectives for the coming year. Going forward, as our enrollment continues to increase, our new major in place, and more offerings of our technology intensive courses; we need to hire another faculty, preferably in the information technology field.

We need Xerox machine passwords and accountability. I would prefer we go paperless, as I use Blackboard for short and long answer exams, projects and other input - feedback and the web for dissemination of documents. The paperless option met with fierce opposition at departmental meetings. It is so easy, yet old habits are deeply ingrained.

**Planning Summary**

Comment on the ways in which the plans for 2013-2014 will change the Department and its programs and assist in serving the mission of your College and the University as a whole.

The successful implementation of the CIT major program will expand our department in terms of enrollment and student success. Students will find the academic and career paths which are optimal for them and their interest/aptitudes/abilities. We need to have CIT in place before we make any serious moves towards and MS in IT. We need to help the students we have before we create graduate programs. Perhaps we can develop the proposal now but any graduate implementation will need to wait till CIT stabilizes.

As Dr. Ku noted: “A graduate degree program has been inquired about by many potential applicants.” He attended many functions at UPS Information Services and many alumni at UPS asked about a master program that they could attend part-time. Our department needs to explore this opportunity. I concur. Long ago, I wrote a set of graduate course outlines (now obsolete). While it is attractive, we need to proceed cautiously, as we are presently in a strained state.

The goals and objectives of our plan are aligned with the strategic plans of the College of Science & Health and William Paterson University.
Summary of Faculty Achievements
Research, Scholarship, and Creative Expression
(Please attach individual faculty reports)

Publications, Performances, Productions, Exhibits, Lectures or Presentations

Please tabulate from the attached individual faculty achievement forms the following:

A) Publications

1. Number of papers published in referred publications:
   - Ku – 1 journal paper
   - Ku – 4 conference papers

2. Number of papers published in non-referred publications:

3. Numbers of books published:
   a. edited
   b. single author
   c. chapter contribution

4. Other (e.g. electronic publication)

B) Artistic Artifacts/Events

1. Number of performances
2. Number of productions
3. Number of exhibits

C) Lectures or Presentations

1. Number of juried presentations:
2. Other lectures
   - Ku – 1, Hu -1,
3. Number of contributed lectures:
4. Number of residencies/workshops
   - Su - 2, Hu - 1

Overview

Please write a brief overview of the Department’s accomplishments this year in the following areas:

1. Research, scholarship and creative activities of the faculty.

   With one exception, we need to encourage and promote faculty research and publication. Resources need to be routed in these directions. More conference travel funding needs to be set aside.
This has already been covered in Item #1 under the “Faculty” section and Item #1 under the “Research” section.

2. Research, scholarship and creative activities of students in the major.

   Summary: Good – Several students are involved in research in digital signal processing and other areas. Some works are in progress.

3. Grant-seeking activities of the faculty.

   Need to promote more grant-writing.