SWOT

Strengths:

Strategic plan for growth in research and teaching which emphasizes research and teaching collaboration with existing synergistic activities on campus and new faculty hires.

Faculty & Research
- Strong faculty qualification, talented and dedicated, knowledgeable and cooperative faculty, great collaboration and good communication among faculty.
- A critical mass of faculty, quite reasonable size (almost enough to cover a variety of basic courses). High quality faculty having expertise in a broad range of modern CS fields.
- Strong research potential with proven records of high quality research, relatively good faculty members in research; active faculty publication activities.

Working Environment
- Strong leadership, good department chair
- Strong department level support for faculty research activities
- Supportive working environment among department members
- Excellent administrative support
- Cohesive department with stability
- Excellent secretarial work, good secretary

Academic Programs
- ABET-accredited BS CS program
- Well defined program assessment (including program objectives, course learning outcomes, and instruction assessments).
- Flexible curriculum management with devoted teachers.
- Good Master of Science program with new courses.
- Excellent undergraduate curriculum including a well developed BS degree in Computer Science and an innovative BA degree in Computer Science with an area of a discipline other than CS.
- Good faculty members in teaching and TA support

Engaging Students in Research
- Numerous research/independent study opportunities for students
- Large number of students associated to department projects and events
- Easy to involve students in projects via independent study

Research and Instructional Facility
- Creation of the Information Analytics and Visualization (IAV) Center.
Strengths, Weaknesses, Opportunities and Threats (SWOT)
Department of Computer Science

- Good computing environment (labs and server).
- Adequate lab facilities.

**Interactions with Community**
- Well embedded in regional industry and corporations.
- Close relationships with local DoD companies.

**Weaknesses:**

**External Grants and Graduate Program Development**
- Inactive in research funding. Develop more national/state level grant proposals and increase/establish funds available for RAs.
- No PHD program.
- Not enough full-time dynamism yet in graduate students to drive grants (understandable due to part-time students who work).
- Theoretical CS is under-represented in the program as well as in research.
- Need to involve more graduate students in research.
- Need to increase the number of Thesis-option M.Sc. graduates.
- Need to grow full time graduate students in M.Sc. program.
- Increase collaborative research/projects among the faculty member.
- Not many strong publications.
- Few internal seminars and special presentations.
- Weak ties and communication to WL CS.

**Graduate and Undergraduate Students**
- Not many CS (graduate and undergraduate) students;
- Small graduating class each year (low retention and graduation rate); number of BS CS graduates each year.
- Little student participation in co-op program and internships.
- Stale promotional materials including CS Web page.
- Lack of technical support outside of CS labs; tutoring and collaboration.
- No full time operator to support CS.
- A hodge-podge of mass communication channels with students.

**Instructions and Curriculum**
- Poor delivery of capstone software engineering sequence.
- Senior design course supported by all faculty which provides students flexibilities in choosing a project having their interests and active participation in the research.
- Little to no sense of what goes on in colleagues classrooms (e.g., their teaching styles and material emphasized).
- Too much teaching load.
Strengths, Weaknesses, Opportunities and Threats (SWOT)
Department of Computer Science

- Need a faculty for teaching graduate courses in programming languages and operating systems.
- No courses in mobile applications.
- No software engineering curriculum.
- Need to bring graduate and undergraduate curriculum up-to-date.

Outreach
- Outreach beyond DoD companies for collaborations such as orthopedic and manufacturing companies
- Lack of activities between faculty, students and industry
- Inactive advisory board

Faculty, Space and Finance
- Small sized faculty; needed one new junior faculty in each of the years 2012, 2013, 2014
- Not many professorial ranked faculty to represent/protect department.
- Need active associate professorial ranked faculty to support department
- Space for LTL teaching support; student’ research and technical support
- Inadequate S&E, and fund to support the urgent activities.
- Incomplete department P&T criteria and faculty sabbatical leave guidelines.

- Limited program visibility and corresponding limited ability for student to grow beyond classrooms, and to increase recognition by helping faculty submitting proposals at the federal, state, private corporations and foundations

- Insufficient money for new research development (equipment, research assistants) or matching funds for proposed research at the department level. This is a critical need for faculty incentive and moral

Opportunities:

IAV Center and Research
- Excellent faculty dedicated to teaching, combined with a new $500K IAV center that will augment the research arm, producing grant opportunity
- Opportunities to find research grants from industry and government agencies
- Increase engagement/external funding thru new center of excellence
- Tremendous opportunity to team up with other universities to produce grants for the IAV center work
- Develop interdisciplinary research / projects using IAV center
- Develop collaborative grants proposals and projects among CS faculty

Graduate and Undergraduate Programs Enhancement
- IAVC is a huge opportunity toward growth, visibility and recognition
Strengths, Weaknesses, Opportunities and Threats (SWOT)
Department of Computer Science

- Make the department more research oriented
- Booster research and funding with compensation.
- Explore joint projects/programs with other departments/universities
- Strengthen the graduate program; increase its student enrollment including 2+2 graduate programs
- Develop emerging program/courses such as IT and mobile computing
- Gain new majors via BA program and joint programs such as 3+2 programs
- Offer more online courses
- Student-taught seminar series
- Presenting eye-catching uses of computer science to freshman
- Letting freshman know that there are job opportunities in CS
- Student internships and Co-op programs are available
- Build up the department from recent joining faculty members
- Increase CS student enrollment, such as enlarge CS size with including similar program, e.g., IS and enlarge CS size with including non local students.
- Attracting more engineering students into our courses (the trend is improving)
- Expand outreach activities, e.g., high school programming contest
- Maintaining and utilizing better contact to our alumni

Visibility and Outreach
- Increase visibility of IAV Center to local industries
- Work with other IPFW Centers of Excellence
- Increase visibility of CS department to non-affiliated regional businesses
- Increase visibility of the CEE program to surrounding community, high schools, local colleges, K-12 programs and beyond county, state borders.
- Extend Continuing education and distance learning beyond state line and country
- Maintaining and utilizing better contact to our alumni
- New department website

Threats:

Encroachment and Inconsistency
- Continuing encroachment on CS mission by other departments
- Varying level of solidarity and goodwill within the college

What if we have enough time in the day to do everything?
- Loss of expertise thru retirement of senior faculty
- Balancing teaching quality with research
- Faculty complacency, heavy consultant engagement with industries, less service to the department.
- Not be able to attract new faculty member in Programming languages and software engineering, and OS
- Lack of adequate teaching and research resources including space
• Not much participation of students in faculty research
• Simply not enough time in the day to do everything

What if we have collaborations and partnerships?
• Lack of practical collaborations with local DoD industries caused by security-related issues
• Limited research funding by local companies
• Local/regional companies not recruiting our graduates
• high University overhead and bureaucracy makes it harder to secure external funding.

What went wrong?
• Failure to increase student majoring in CS.
• May shrink CS because of enrollment and academic-rigor programs.
  • without significant research.
  • without external funds
  • comparatively difficult CS courses (academic rigor).
• Retaining students vs. academic rigor.
• Low retention and graduate rate.
• Large number of unprepared students.
• Students complaints against heavy coursework assignment loads.
• Difficulty of integrating credits for transfer students.
• Subjects overlapping with other departments that may negatively affect in maintaining the quality of education.
• Perception of low-quality programs due to poor experiences in undergraduate and graduate software engineering classes.
• High variance in student ability and experience.
• Perhaps other universities who attract top talent that we need to compete against.
• Curriculum not up to date.

What if we have a better financial support?
• Less financial support by the state and university.
• Overall financial weaknesses may threaten the hiring of new faculty at the desired level.
• Decreased funding for travel and S&E.
• Reduction in state funding to maintain and improve laboratory facilities.
• Somewhat decreasing pool of good students willing to work as TAs.