To: Dean Van Galen, Chancellor  
116 North Hall  
University of Wisconsin-River Falls 

From: Wes Chapin, Chair  
Faculty Senate  
University of Wisconsin-River Falls 

May 9, 2013 

RE: UWRF Faculty Senate Motion 2012-13/144 

At the May 8, 2013 meeting of the University of Wisconsin-River Falls Faculty Senate, this motion was passed. The motion is forwarded to you for your action.

Motion from the Academic Program and Policy Committee (James Zimmerman, Chair) to approve the creation of a Master of Science in Computer Science.

Approved  

Disapproved  

Dean Van Galen, Chancellor  

Date 5/20/13
TRANSMITTAL for GRADUATE PROGRAMS: Changes or Proposals

I. INFORMATION:

A. Check all that apply: Existing Program □ New Program ✓
   Name Change □ Credits Change □ Change in Curriculum □

B. Program Title: Master of Science in Computer Science

C. Department(s) (Originating): CSIS D. College(s) (Originating): CBE

E. Programs / Departments Consulted (Requires letters of comment from all departments or programs substantially affected. Signatures of dept. chairs & deans affected by this proposal are required on the attached addendum.):
   1) MNGT 2) MBA 3) 4)

F. Catalog year of Implementation: Semester Fall Year 2014

G. Have all courses in this program been approved? Yes ☐ No ☑

H. Attach Request Narrative
   Include in narrative on attached pages clarification concerning which courses have not been approved, and a rationale for the requested changes or creation of program. If requesting a program change also include a listing of course array for both the current and proposed program?

II. UNIT APPROVALS: Requires signatures of all Department Chairs and Deans whose programs will be substantially affected by the changes or proposal. Signature lines for the affected Departments and Colleges (noted in “E” above), are on the addendum to this form. These signatures should be obtained prior to review by all other shared governance levels.

<table>
<thead>
<tr>
<th>Department Curriculum Committee Chair (optional)</th>
<th>Signature</th>
<th>Date</th>
</tr>
</thead>
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<tr>
<td>Department/Program Chair</td>
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<td>College Curriculum Committee Chair</td>
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<td></td>
<td>4/5/2013</td>
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<td>University Curriculum Cmtt. Chair</td>
<td></td>
<td>5/10/2013</td>
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<tr>
<td>Academic Policy &amp; Program Cmtt. Chair</td>
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<tr>
<td>Faculty Senate Chair</td>
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<td>5/8/13</td>
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<tr>
<td>Provost / Vice Chancellor</td>
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<td>6/8/13</td>
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<tr>
<td>Chancellor</td>
<td></td>
<td>5/21/13</td>
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*NOTE: The master copy of this transmittal & accompanying documents must be filed in the Provost’s office upon final approval. The Provost’s office will notify all appropriate administrative offices [Registrar, Office of Graduate Studies, Dean(s), Department Chair(s)] of approvals & necessary actions to implement changes.
Proposal for Authorization to Implement New Program

1. PROGRAM IDENTIFICATION

1.1. Title of Proposed Program:
Master of Science, Computer Science

1.2. Department or Functional Equivalent:
Computer Science and Information Systems

1.3. College, School, or Functional Equivalent:
College of Business and Economics

1.4. Anticipated Time of BOR Review and Implementation:
Fall, 2014

1.5. Delivery Method:
Mixture of evening and weekend face-to-face, online and hybrid courses.

2. CONTEXT

2.1. History of Program: The Department began discussing the program in the Fall of 2011 as a part of the UWRF Strategic Initiatives agenda. Discussion with external potential employers and students was initiated on an informal basis. As a result of this informal study, a proposal was submitted as a UWRF Strategic Initiative. The proposal was accepted with the approval of the Department, Dean, Provost, and Faculty Senate. Following approval, the Provost's Office initiated a market survey conducted by Hanover Research. The results of the study were positive.

UWRF submitted a Notice of Intent in the Fall of 2012. No objections were raised to the program. The Department initiated planning for program authorization and development in late Fall of 2012. Part of that process was developing a local and regional market analysis. The Hanover Market Study was supplemented by examining educational data from the U.S. Bureau of the Census data for both Wisconsin and Minnesota focusing on the MSP MSA and the St. Croix Valley Region. Data issued by the Ministry of Education of the PRC were obtained to develop an estimate of possible international demand. In addition, a competitive analysis was. Input was sought from potential students/alumni and from experts in the international student markets. That analysis indicated good support for the program and also indicated potential program focus and type of delivery.

2.2. Instructional Setting of Program: The Master of Science, Computer Science will reside within the Department of Computer Science and Information Systems, College of Business and Economics.
2.3. **Relation to Mission and Academic Plan:** The University of Wisconsin, River Falls Master of Science in Computer Science (MSCS) program is intended to begin in September of 2014. The program will enhance the reputation of the UWRF in the St. Croix Valley by supporting an inclusive campus community of highly engaged learners and scholars. The program will provide a challenging, supportive, student centered environment that is characterized by academic excellence, inspiring and preparing students to serve as ethical, informed citizens and leaders in an increasingly complex, diverse and global environment.

The proposed MSCS program fits well with the strategic plan of the University. An 89% placement of our undergraduate students in a CSIS related field, as indicated by a recent Alumni Survey, is strong independent evidence of the program’s Distinctive Academic Excellence. Creation of the proposed MSCS program to serve an emerging market serves to increase that academic distinction.

The proposed MSCS program will significantly contribute to the **Global Education and Engagement** goal of the Pathway to Distinction strategic plan for UWRF. The program will attract international students to UWRF and contribute to international reputation of UWRF. The already diverse CSIS faculty will be well-positioned to recruit, serve and lead students from around the world and the United States.

The proposed MSCS program relates directly to the **Innovation and Partnership** strategic goal of UWRF Pathway to Distinction. The technology industry is experiencing an increasing shortage of graduates in Computer Science and especially those with advanced degrees. Technology is one of the fastest growing fields worldwide with the result that there is an increasing demand for highly trained professionals. The *Yale Daily News* reports that applications for their M.S. degree in Computer Science grew by 45% from 2011 to 2012. *InfoWorld* reported that there was a 72% increase in job openings in the computer science field from January 2010 to October 2011. These and other indicators noted below make the case that there is a high demand and a growing demand for professionals in Computer Science who have an advanced degree.

Approval of a new Master of Science in Computer Science degree would allow the University to more fully address the needs of the business community in our service area and beyond. The results would be enhanced reputation for the University and increased revenue.

The proposed MSCS program is directly referenced by the “Building Enrollment through Distinctive Academic Programs” initiative of 2012 Pathway to Distinction Strategic Plan for UWRF.
3. **DESCRIPTION**

3.1. **Program Description**: The program will be a 30 credit Master of Science degree. It will be composed of 24 credits of required courses in CSIS (Computer Science and Information Systems) and 6 credits of electives from selected MBA courses with concentration in Management and Leadership. The program will concentrate on the following areas: Mobile Computing & Development; Information Security; Cloud Computing; Data Science and Big Data; Knowledge Discovery and Machine Learning; and Innovation and Product Development. The program will also include two MBA elective courses, selected from Leadership and Ethics, Operations Management, Strategic Marketing Management, Human Resource Management, or Financial Management.

The credibility and integrity of the program will be maintained primarily through personal contact. This program is projected to be a small, hands-on program in which students work closely with specific faculty members. As a result, faculty will be able to determine if the students' work is indeed the work of the registered student.

3.2. **Objectives**: Objectives and Learning Outcomes:

A graduate will be able to develop solutions in the specific and specialized Computer Science areas in the curriculum.

A graduate will have generalized knowledge and skills in the management of technology as they relate to the specialized areas in the curriculum.

A graduate will have the knowledge and skills to perform effectively as middle managers or above in positions related to the specialized areas in the curriculum.

3.3. **Curriculum**: Admission to the program will require a bachelor's degree in a Computer Science related major with an overall undergraduate Grade Point Average (GPA) of at least 2.75 / 4.0 or a major GPA of at least 3.0 / 4.0 or a GPA of at least 3.0 / 4.0 for no fewer than 9 semester credits of graduate study at another accredited graduate institution. Lower GPAs will be considered with substantial relevant work experience. Students with a bachelor's degree in fields not closely related to computer science also may qualify with relevant work experience.
The program will be a 30 credit Master of Science degree. It will be composed of 24 credits of required courses in CSIS (Computer Science and Information Systems) and 6 credits electives from the evening MBA program as shown in Tables I and II below:

### Table I: 24 Credit of required courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Existing/Proposed</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSIS 730</td>
<td>Enterprise and Cloud Computing</td>
<td>3</td>
<td>Proposed</td>
<td>None</td>
</tr>
<tr>
<td>CSIS 731</td>
<td>Distributed and Mobile Computing</td>
<td>3</td>
<td>Proposed</td>
<td>None</td>
</tr>
<tr>
<td>CSIS 732</td>
<td>Information Security</td>
<td>3</td>
<td>Proposed</td>
<td>None</td>
</tr>
<tr>
<td>CSIS 733</td>
<td>Computing for Data Science and Big Data Analysis</td>
<td>3</td>
<td>Proposed</td>
<td>None</td>
</tr>
<tr>
<td>CSIS 734</td>
<td>Software Engineering and Design Patterns</td>
<td>3</td>
<td>Proposed</td>
<td>None</td>
</tr>
<tr>
<td>CSIS 735</td>
<td>Machine Learning and Knowledge Discovery</td>
<td>3</td>
<td>Proposed</td>
<td>None</td>
</tr>
<tr>
<td>CSIS 736</td>
<td>Technology Innovation, New Product Development and Sustainability</td>
<td>3</td>
<td>Proposed</td>
<td>None</td>
</tr>
<tr>
<td>CSIS 738</td>
<td>Practicum</td>
<td>3</td>
<td>Proposed</td>
<td>Instructor's Permission</td>
</tr>
</tbody>
</table>

### Table II: 6 Credit of MBA electives, selected from the following courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Existing/Proposed</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>MNGT 700</td>
<td>Organizational Theory and Behavior</td>
<td>3</td>
<td>Existing</td>
<td>Yes</td>
</tr>
<tr>
<td>MNGT 701</td>
<td>Leadership and Ethics</td>
<td>3</td>
<td>Existing</td>
<td>No</td>
</tr>
<tr>
<td>MNGT 702</td>
<td>Strategic Marketing Management</td>
<td>3</td>
<td>Existing</td>
<td>Yes</td>
</tr>
<tr>
<td>MNGT 703</td>
<td>Human Resource Management</td>
<td>3</td>
<td>Existing</td>
<td>Yes</td>
</tr>
<tr>
<td>MNGT 705</td>
<td>Operations and Project Management</td>
<td>3</td>
<td>Existing</td>
<td>No</td>
</tr>
<tr>
<td>MNGT 706</td>
<td>Financial Management</td>
<td>3</td>
<td>Existing</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Potentially the program could be completed by a full-time student in one calendar year; the majority of potential students in the program will take two classes per semester and one summer course. The potential student for this program is already in a position/job and will not be leaving that position/job while completing this degree. Assuming a 2 course load, students would complete the program in five semesters.

This is a graduate program. As noted in the table above, there are no undergraduate courses in the curriculum for this degree.
3.4. **Delivery Method:** This program will be offered in a mixture of evening and weekend face-to-face, online and hybrid courses. The target audience is within driving distance of either the main UWRF campus or the Hudson Center operated by UWRF.

UWRF makes extensive use of the UW System online course management system (D2L). A part of D2L is Turn-It-In, a plagiarism detection system. Because there will be direct interaction with students in the courses within the curriculum, the potential for fraud is mitigated.

Students will have the complete range of resources available to them that any UWRF graduate student would normally be afforded. Students will be assigned an academic advisor who will work with students directly and via technology to determine if they are progressing in an appropriate manner and making good use of learning resources. The advisor will be responsible for determining if intervention is needed.

3.5. **Interrelationship with Other Curricula:** As a part of the alumni potential student survey, coursework in management was suggested by alumni. The Department worked with the Management Department and faculty at UWRF to develop a list of appropriate courses. Six elective credits (two courses) was determined by CSIS to be optimal for the program and the Management faculty graciously agreed to work with CSIS, making a list of six courses (Section 3.3) available to the proposed MSCS program.

3.6. **Accreditation Requirement:** ABET (Accreditation Board for Engineering and Technology, Inc.) specialized or program accreditation is available for programs such as this master's program. CSIS has explored ABET accreditation in the past and has determined that, at this point in time, the Department will not seek ABET accreditation.

3.7. **Diversity:** Faculty members at UWRF are highly committed to inclusiveness and such considerations are typically visible at the level of course content, assignment, and readings. The Computer Science department is composed of a very diverse faculty from different parts of the world.

The primary focus of the Department of Computer Science and Information Systems has been to increase the number of women and minorities in the undergraduate programs. The thrust of the MSCS program is to further the education and skill levels of those who already hold a bachelor's degree. Those who possess the bachelor's degree in computer science locally, regionally, and nationally typically do not evidence gender or racial diversity. Nonetheless, the Department will specifically target institutions (educational and work-place) in the market area which have developed a more diverse student body or work force. The focus for UWRF and other institutions with computer science programs is to increase diversity at the undergraduate level, leading to a deeper pool of diverse candidates for advanced
degrees. The CSIS Department will continue, however, to seek women and minorities for the MSCS program in its market area.

3.8. **High-Impact Practices:** The program will incorporate the following high impact practices:

*Common Intellectual Experiences:* The compact nature of the curriculum and the grouping of coursework around thematic areas means that students working their way through the curriculum will have a vertically organized general education program that includes advanced integrative studies.

*Learning Communities:* Students who are taking courses together will be able to integrate their learning across courses. Because of the nature of graduate work, they will be specifically addressing problems that matter beyond the classroom. The courses in the program are linked, making group work and interaction with other students and the professor(s) not only possible but a significant component of the program.

*Collaborative Assignments and Projects:* A fundamental aspect of computer science is the interaction and collaboration required for success. This collaboration will be both keener and an essential ingredient in the master's program. Collaborative assignments and projects that involve students, faculty, and companies and institutions outside the University will be a benchmark of this program.

*Capstone Courses and Projects:* The practicum (CSIS 738) is intended to be a final showcase of what the student has learned and what he/she can do with that knowledge.

3.9. **Collaboration:** The market for the program is specific but not narrow. As a result, while UWRF values inter-institutional collaboration for a variety of reasons, including cost-savings, faculty expertise, and resources, we do not foresee immediate opportunities for inter-institutional collaboration. As the program matures, we will examine opportunities for collaboration.

3.10. **Outreach:** In large measure, this program is an outreach program. On one hand, it is the result of examining, internally, what CSIS can do to assist UWRF in meeting its strategic objectives. It is also the result of alumni suggestion that master's level coursework, oriented in specific areas, should be offered by the University. The Department is involved in pre-college initiatives, for example, a computer boot camp for faculty in middle and high schools teaching computer science. The Department sees the master's program as a part of the continuum of offering pre-college initiatives and post-baccalaureate opportunities.

4. **NEED**
4.1. **Comparable Programs in Wisconsin:** There are no comparable programs offered by Universities in Wisconsin within 100 miles of the UWRF campus. Neither UW Eau Claire nor UW Stout offer Masters Degrees in Computer Science. UW Lacrosse lies 130 miles from UWRF and offers an M.S. in Software Engineering which is not exactly comparable to an M.S. in Computer Science containing some managerial and entrepreneurial content. Thus, it is unlikely that this program would compete with a program launched by UWRF.

4.2. **Comparable Programs Outside Wisconsin:** Several universities in Minnesota with campuses near UWRF offer M.S. programs in some aspect of C.S. These include: 1) University of Minnesota with an M.S. in C.S, an M.C.S. and an M.S. in Software Engineering, 2) Metropolitan State with a Master of Management Information Systems, 3) University of St. Thomas with an M.S. in Software Management along with a Dual M.S./M.B.A. program, and 4) St. Mary’s University Twin Cities Campus with an M.S. in I.T. Management.

The U of M programs are heavily tech-oriented and without managerial or entrepreneurial content. Programs from the other three schools do contain some business content. However, a program launched by UWRF would have a reputation quality competitive advantage against Metro State and St. Mary’s and would be more conveniently located for the prime geographic markets of St. Croix and Washington Counties.

Two universities farther afield offer programs. These include: 1) Mankato State, with an M.S. in I.T., and 3) St. Cloud State, with an M.S. in C.S. Both universities are far enough from the Twin Cities East Metro that they should not be considered direct competitors except, perhaps, on their geographic margins relative to UWRF.

This competitor analysis indicates the existence of an available geographic market segment consisting of the East Metro, especially Washington and St. Croix Counties that UWRF could fill.

4.3. **Regional, State and National Needs:** Two data sources delineate the need for the program.

4.3.1. **Hanover Research Report:** The report prepared for UWRF by Hanover Research in August 2012 shows that demand for CS-related fields has been projected to grow 6.9% in Wisconsin 2010-2018 and 14.4% in Minnesota from 2010-2020. For CS positions that require graduate-level training the Wisconsin projections are: 18.2% for software applications developers, 9.3% for computer systems analysts, and 7.1% for network and computer systems administrators. In Western Wisconsin demand projections are as follows: 6.5% for computer and information systems
managers, 8.7% for computer systems analysts, and 5.7% for network and computer systems administrators (Hanover Research 2012).

In Minnesota CS-related positions are projected to increase by 14.4% from 2010 to 2020. For CS positions that require graduate-level training the projections are: 13.9% for computer and information systems managers, 14.9% for computer systems analysts, and 18.5% for network and computer systems administrators (Hanover Research 2012).

4.3.2. Census Data: The Minnesota growth rate is particularly significant for UWRF because most of it stems from the Twin Cities Metro Area which contains 83% of all jobs in the state. The projects also show that there will be strong demand in the top occupations in CS. We can infer that many of these types of positions would require a master’s degree.

Given the proximity of the River Falls Campus and the Hudson Center to Washington and St. Croix Counties, CBE considers these areas as its prime geographic markets for graduate programs. Population growth rates for these counties are projected to be among the highest in their respective states. The Minnesota State Demographic Center projects Washington County growth rate of greater than 15% from 2010-2020 (www.demography.state.mn.us). St. Croix County remains the fastest growing county in Wisconsin. The January St. Croix County Business Profile shows that according the, U.S. Bureau of the Census, the increase has been projected at nearly 30% from 2010 to 2020 more than 58% by 2030 (http://www.stcroixbusinesspark.com/downloads/2011_StCroix.pdf).

4.4. Student Demand – Future Enrollment: Looking at demand and future enrollment, the Department examined a number of data sources. Four are included below.

4.4.1. CSIS Alumni Survey: The CSIS Department recently conducted an alumni survey aimed to gauge likely demand for an M.S. program. In October of this year, e-mail solicitations were sent to 428 alumni. One hundred twenty-six alumni responded which represents a very good response rate of 29%. When asked what type of program would best meet their needs, the largest percentage (47%) of respondents indicated interest in enrolling in a program containing a broad focus on technical C.S. topics along with managerial and entrepreneurial. About 31% were interested in a program with technical content alone and the rest indicated that they did not anticipate enrolling in a graduate program.

Eighty-nine alumni responded to the question concerning what business/management courses offer. The business/management content most demanded seems to be Product/Project Management (76% indicating interest),
Leadership (58%), and Product Innovation and Design (35%). There was also some interest in Financial Management (29%).

Potential demand among alumni was measured using a 7-point scale (1 = Very Unlikely – 7 = Very Likely) with the question, “If the Department of Computer Science at UWRF were to offer an M.S. in C.S. that meets your needs what is the likelihood that you would enroll?” Mean response (89 respondents) was 4.35. Nearly half of the respondents (49%) responded at points 5 through 7 indicating a favorable inclination toward a program. A full 10% responded at scale point 7, i.e., “very likely.”

The results of this survey offer support in favor of launching a program because they indicate that there is likely to be demand in the market for it. However, one should remember that these results are based on responses from alumni of the undergraduate programs in C.S. at UWRF. Thus, the data probably contains some response bias in favor of the program. People who had a good experience with the C.S. program at UWRF are more likely to respond to the survey that those who did not. Also, there may be a bit of a demand effect. That is, alumni may respond more favorably that they actually believe in an effort to “help out” the department in its attempt to launch a program.

Despite these caveats one can safely conclude that the survey results support a program launch.

4.4.2. Census Data: Another way of assessing likely demand for a program is to compare the data on Bachelor’s and Master’s Degrees in C.S. conferred in the United States. Examining data from the U.S. Dept. of Education indicates from the 2004-2005 to the 2010-2011 academic year that in C.S. the proportion of Master’s to Bachelors’ Degrees conferred ranged from 34 to 47%. When applying a five year interval between completion of Bachelor’s Degree and Master’s Degree the percentages range from 30 to 48% for the same period. Thus, there seems to be significant demand for graduate programs among C.S. professionals nationally. There is no reason to believe, given the strength of our regional economy, that local demand would be weaker than this.

4.4.3. Hanover Research Report: The results of this analysis are consistent with the report prepared for UWRF by Hanover Research in August 2012. Hanover reported that demand for master’s programs is at least constant and probably increasing nationally and within our region. Specifically completed master’s degrees in C.S. and similar fields increased by nationally 5.7% from 2007 to 2011. The increase in Minnesota and Wisconsin together has been 8.72%.
4.4.4. **International Demand:** We hope to draw some international students to the program. However, finding reliable data to use in estimating this demand is very difficult if not virtually impossible. The main sources of demand are likely to be China, India, South Korea, and Saudi Arabia.

However, we were able to obtain some data from the Ministry of Education of the PRC (www.moe.edu.cn). This indicates that there were about 2.4 million degrees in Science and Engineering completed in a recent year. Nearly 2.6 million degrees in these fields were projected for the following year. It is a reasonable assumption that many of these degrees were completed in C.S.-related fields.

In drawing international students experience has shown that most key is leveraging existing relationships for that purpose. CBE has one of the most international groups of faculty at UWRF and has several international relationships.

<table>
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<th>Year</th>
<th>Implementation Year</th>
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<th>3rd year</th>
<th>4th year</th>
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<tr>
<td>Continuing students</td>
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<td>Total enrollment</td>
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<td>25</td>
<td>45</td>
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<tr>
<td>Graduating students</td>
<td></td>
<td></td>
<td>20</td>
<td>20</td>
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</table>

4.5. **Alternate Program Delivery and Collaboration to satisfy need:** Working from the Alumni survey initiated by the Department, a combination of on-line and on-campus evenings and Saturdays was by far the most preferred delivery method. Indeed, 53% of respondents indicated this preference. About 18% preferred completely on-line. Only 13% indicated a preference for on-campus only weekday evenings and Saturdays and 12% preferred a combination of on-line and on-campus Saturdays only.

An on-campus weekday schedule would not be attractive to most respondents. Around 87% indicated that such a schedule would prevent them from enrolling. Further, 26% indicated that they would not enroll in a completely on-line program. Only 16% indicated that they would not be able to enroll in a combination on-line and on-campus evenings and Saturdays and 8% indicated that they could not enroll in combination on-line and on-campus Saturdays only.

With respect to course length, the most respondents (46%) indicated a preference for a combination of 16 and 8-week courses. About 30% seem to prefer 16-week courses meeting once per week and 25% prefer 8-week courses meeting once or twice per week.
Around 75% of the respondents who indicated a positive likelihood of enrolling indicated that they lived within reasonable driving distance from River Falls. It is noteworthy that about a quarter indicated that they did not live within reasonable driving distance. This could mean that a program might draw some enrollment from significant distances or that there is a segment that would enroll in a primarily on-line program. However, based upon the findings of this survey it seems that a combination on-line and on-campus program comprised of a combination of 16 and 8-week classes would be most successful.

5. ASSESSMENT AND ADVISING

5.1. Assessment: This program will use the existing general assessment plan in place for the Department. The plan incorporates direct and indirect measures and a well-defined feedback loop for program improvement.

Each course will be assessed using direct measures. While these vary, they are most often measures such as embedded questions or activities within the course. These are determined prior to the course offering by the faculty member(s) teaching the course and then approved by the Department faculty. At the end of the semester, the data are analyzed and a report generated. By the end of the next semester, the Department will have decided on a course of action, if necessary, to address issues brought to light by the data, the report, and discussion with the Department. These data are also used at the program level, by matching program goals and learning outcomes with specific questions in the course.

The Department also has a program level assessment which uses indirect measures. Each year there is a graduate survey which asks graduates if their experience matches with the program goals and learning outcomes.

Each academic year, there will be a number of faculty meetings devoted to assessment and ways to improve the program and specific courses within the program.

Program level assessment is rolled into College level assessment and then into the University level assessment. An example of a way in which assessment is used at the program, college and university levels is the Program Audit and Review process in which assessment plays a significant role.

5.2. Advising: On admission to the program, students will be given an advisor. That advisor will be available to them for assistance in course sequencing, for instance, and any academic issue. The Department has a long and excellent history of advising at the undergraduate level. The Department will carry this model into the graduate program. The majority of the prospective students in this program will be available for face-to-
face advising. If face-to-face is no feasible, students in the program are technologically savvy and electronic interaction is a distinct and positive option.

5.3. **Access for Individuals with Disabilities:** The Department has worked well with the University's Disability Services Office and expects to continue that relationship with the implementation of this program. The Department will continue to work with individuals who need accommodation. Examples of prior work with Disability Services is making lecture notes available to students, use of lecture capture technology to allow students to replay lectures at a later time, and increased office hours for individuals who need additional time with the instructor.

6. **PERSONNEL**

6.1. **Current Faculty Resources:** The department currently has five FTE lines and an instructional academic staff. The department anticipates a new FTE hire for the undergraduate program in 2013-2014. This position is critical to the near term future of the undergraduate program. This new FTE, when hired, would replace the current adjunct faculty teaching courses critical to the undergraduate CS program and the BAS in CS. The new hire is also expected to provide important input to the creation of the MS in CS and participate in the delivery of the program.

Although, no FTE from the undergraduate program will be reallocated to the MSCS program, the department has current expertise to deliver most of the proposed program content. During the first year of operations of the program, 0.83 FTE (see section 6.2) of the current faculty will need to be reassigned to the proposed MSCS program. During the second year of the program operation, 0.67 FTE (see section 6.2) of the current faculty will need to be reassigned to the proposed MSCS program. The reassigned faculty member's salary will be transferred from the 102 budget (GPR) to the Program Revenue budget. These funds will be used to hire Instructional Academic Staff faculty to cover the reassigned time.

6.2. **Additional Faculty Resources & Expertise:** The proposed MSCS program will require 0.83 FTE (5/6 => five 3cr courses/six 3cr graduate faculty load) for the first year of operations and 1.67 FTE (10/6) for the second year. During the first year of operation, the department plans to reassign the current department faculty to cover the 0.83 FTE that required by the proposed MSCS program. An Instructional Academic Staff will be hired to cover the 0.83 FTE reassigned time. The department anticipates a new FTE hire in 2014-2015. This additional FTE will be explicitly hired for the proposed MSCS program and will be available for the second year of program operation. The department will cover the additional 0.67 FTE through current faculty reassigned time. An Instructional Academic Staff will be hired to cover the 0.67 FTE reassigned time.
The Department projects initiating an approved search for an individual with expertise in the curricular areas targeted by the program. The Department also understands that such an individual might be rare and would then use current FTE to fill some areas of the program, swapping out courses in the undergraduate curriculum. That is, the additional faculty member would have primary responsibility in the master's program but would teach in the existing undergraduate curriculum when or if they lacked expertise in a particular area. The Department does have current expertise in most areas of the master's program. The amount and level of shifting resources will be a function of the expertise levels of any new hire.

6.3. **Academic Staff:** During the first year of the program operations, the department will need an Instructional Academic Staff to cover for 0.83 FTE reassignment of the current faculty to the proposed MSCS program. Starting the second year of the program operation, the department will need an Instructional Academic Staff to cover for 0.67 FTE reassignment of the current faculty to the proposed MSCS program.

6.4. **Classified Staff:** The proposed MSCS program will need a graduate program director and a program associate. Both of these positions will be 50% time.

6.5. **Describe any realignment of existing programs to accommodate the new program.** As noted above, there could well be some swapping of courses contingent on the expertise and capabilities of the new hire. Any swapping of courses would be on a one-to-one basis.

7. **ACADEMIC SUPPORT SERVICES**

7.1. **Library Resources:** The Department has worked with the UWR Librarian to determine if the resources are present to support a master's program as described. In the opinion of the Department and the University Librarian, resources are adequate to support the master's program.

UWR Library is tied into an extensive array of resources, all of which will be available to the master's program students.

7.2. **Access to Student Services:** The proposed program will draw students from a 100 mile radius. This means that student services such as admissions, financial aid, academic advising, and delivery of course materials will be essentially the same as they are for on-campus students. An element that may be different is the level of services offered via technology, such as email, chat, and video conferencing. The Department is already heavily invested in this sort of delivery of student services, especially advising and course content delivery, and will continue to be in the proposed master's program.

7.3. **Technical Support:** The target audience for this program is a group of individuals who are technology savvy. In some cases, they may be in a technical support position
in their current job. Nonetheless, the Help Desk and assistance offered by the UWRF Division of Technology Services to any student will also be available to students in the master's program.

8. FACILITIES - EQUIPMENT

8.1. **Capital Resources – Existing Facilities and Capital Equipment**: The facilities projected for use by students in this program include the following buildings.

8.1.1. **South Hall**: This building houses the offices, labs, and classrooms normally used by the Department. The additional of students from this program will not impinge on building code and/or federal and state regulations of any kind. This building is accessible for those with disabilities. Equipment in the existing labs will be sufficient for the delivery of the program. No additional labs, equipment or classrooms will be needed.

8.1.2. **Hudson Center**: This building is a satellite of the UWRF main campus, located in Hudson, WI. It is a commercial building which was specifically fitted out for classroom use. The additional of students from this program will not impinge on building code and/or federal and state regulations of any kind. This building is accessible for those with disabilities.

8.1.3. **Davie Library**: This building houses the University Library, computer labs, and the Division of Technology Services including the DoTS Help Desk. The additional of students from this program will not impinge on building code and/or federal and state regulations of any kind. This building is accessible for those with disabilities.

8.2. **Capital Budget Needs – Additional Facilities and Capital Equipment Required**: The Department does not foresee additional facilities or capital equipment required for the implementation and offering of this program.

8.3. **Clinical Facilities**: Not applicable.

9. **FINANCE**

9.1. **Operating Budget and Budget Narrative**: The proposed Master of Science in Computer Science (MSCS) will be implemented using the service based pricing model. The tuition generated must pay 100% of the cost of the program, including salaries of faculty, administrators, fringe benefits, all operating costs (S&E) and contribution to College and University overhead. The financial projection for the MSCS program
indicates positive net revenue in the first year of operations. No GPR revenue is requested for the program.

### 9.1.1. Total Budgetary Allocation

<table>
<thead>
<tr>
<th>Table of Estimated Total Costs and Resources</th>
<th>2014-2015</th>
<th>2015-2016</th>
<th>2016-2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>tuition</td>
<td>$655.00</td>
<td>$681.00</td>
<td>$708.00</td>
</tr>
<tr>
<td>Program Revenue</td>
<td>$245,625.00</td>
<td>$459,675.00</td>
<td>$477,900.00</td>
</tr>
<tr>
<td>Instruction</td>
<td>$55,500.00</td>
<td>$111,000.00</td>
<td>$111,000.00</td>
</tr>
<tr>
<td>Program Director</td>
<td>$30,000.00</td>
<td>$30,000.00</td>
<td>$30,000.00</td>
</tr>
<tr>
<td>Program assoc.</td>
<td>$15,000.00</td>
<td>$15,000.00</td>
<td>$15,000.00</td>
</tr>
<tr>
<td>Fringe 48%</td>
<td>$48,240.00</td>
<td>$74,880.00</td>
<td>$74,880.00</td>
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<tr>
<td>Program Promotion</td>
<td>$40,000.00</td>
<td>$50,000.00</td>
<td>$60,000.00</td>
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<tr>
<td>S&amp;E</td>
<td>$10,000.00</td>
<td>$10,000.00</td>
<td>$10,000.00</td>
</tr>
<tr>
<td><strong>Total operating Cost</strong></td>
<td>$198,740.00</td>
<td>$290,880.00</td>
<td>$300,880.00</td>
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<tr>
<td>University overhead</td>
<td>$23,442.50</td>
<td>$82,741.50</td>
<td>$86,022.00</td>
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<tr>
<td>18% of gross up to maximum of 50% of net</td>
<td>Paid to University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>College Overhead</td>
<td>$23,442.50</td>
<td>$105,725.25</td>
<td>$109,917.00</td>
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<tr>
<td>5% gross up to maximum of 50% of net</td>
<td>Paid to CBE</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total Overhead</strong></td>
<td>$23,442.50</td>
<td>$105,725.25</td>
<td>$109,917.00</td>
</tr>
<tr>
<td>Program Costs</td>
<td>$222,182.50</td>
<td>$396,605.25</td>
<td>$410,797.00</td>
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<tr>
<td>Net Revenue</td>
<td>$23442.50</td>
<td>$63069.75</td>
<td>$67102.50</td>
</tr>
<tr>
<td>allows for upkeep and modernization of facilities, contribution to salary</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
9.2. **Operating Budget Reallocation**: The proposed program will operate under the service-based pricing model and will require no reallocation of existing operating budget.

9.3. **Extramural Research Support**: Not applicable.

*For Service-Based Pricing and/or a Distance Education Program also include:*

9.4. **Costing Methodology**: The costing methodology used for this program follows other service-based pricing programs already in place at UWRF.

9.5. **Commitment to Maintain Program**: Oversight of the program will lie with the CSIS Department. However, the Office of the Dean of the College of Business and Economics is charged by the Provost to ensure that this and other programs are viable both academically and financially. This entails that appropriate faculty, equipment, facilities, technical expertise, and financial planning exist to sustain this and other programs over time.

The proposed MSCS program is expected to generate positive cash flow in the first year of its operation. Revenue generated by the program will be shared between the University, the College and the Department. Overhead paid to the University is computed at 18% of gross revenue, but only up to 50% of the net revenue. Overhead paid to the College of Business and Economics is computed at 5% of gross revenue, but only up to 50% of the net revenue. Net Revenue left after the overhead paid to the University and the College will be used for upkeep and modernization of the department’s facilities and will contribute to salary of new faculty.

9.5.1. **Contingency for insufficient net revenue**: If for some reason the revenue is less than projected or cost is greater than projected, the existing MAB 131 account (program revenue) has surplus of which $100,000.00 can be allocated to cover the proposed MS in CS program.

9.5.2. **Condition for continuation of the program**: The University will not allocate 102 funds to support this program. If it is determined that the program cannot cover full costs, the existing MBA surplus covers the loss and the program is phased out. No 102 (GPR) funds will be allocated to this program. Dr. Hossein Najafi, Chair of Computer Science Department, will be responsible for the budget. The program and budget will be controlled by him and the program director. The University controls budgets through their normal oversight structure responsible to the Assistant Chancellor of Business and Finance and the Chancellor.
9.5.3. **Contribution of funds to support the Undergraduate CSIS programs:** When a faculty member’s salary payment is transferred from the 102 (GPR) budget to the Program Revenue Budget, the GPR dollars remain in the CSIS GPR budget. These funds may be used in a variety of ways such as: to hire adjunct faculty; to contribute to other costs of the program; be returned to College of Business and Economics GPR account; be returned to the University GPR account. These funds help at the Department, College and University level to support academic programs. The actual use of these funds is negotiated with the College Dean and the Assistant Chancellor for Business and Finance.

9.6. **Tuition Pricing:** The results of a competitive study were used to derive a value for per-credit tuition. The proposed program uses the service-based pricing model. We chose the tuition level of the UWRF MBA program as a benchmark. That program features a mid-market price point that is chosen to communicate a quality/value positioning. The mid-market price point differentiates the program from low-priced competitor on quality and from high-priced competitors on value. This approach makes a great deal of strategic sense for the MSCS. It is imperative that the program is priced to be competitive in the market and offer an excellent value to students and the community. The program tuition is a significant issue for students due to the growing trends by corporations to limit the tuition reimbursement to $5300.00 per calendar year per student. Our program is priced to be a less expensive alternative to other institutions while offering a high quality education.

<table>
<thead>
<tr>
<th>Institution</th>
<th>Length</th>
<th># of Courses</th>
<th>Cost per credit</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metropolitan State University</td>
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<td>9</td>
<td>$327.00</td>
<td>$11,118.00</td>
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<tr>
<td>St. Cloud State University</td>
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<td>12</td>
<td>$337.55</td>
<td>$10,801.60</td>
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<td>University of Minnesota Duluth</td>
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<td>11</td>
<td>$338.18</td>
<td>$11,159.94</td>
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<tr>
<td>Minnesota State University, Mankato</td>
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<td>12</td>
<td>$380.00</td>
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</tr>
<tr>
<td>Saint Mary's, Winona Campus</td>
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<td>15</td>
<td>$400.00</td>
<td>$14,800.00</td>
</tr>
<tr>
<td>Northern Kentucky University</td>
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<td>11</td>
<td>$468.00</td>
<td>$14,040.00</td>
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<tr>
<td>Concordia University Wisconsin</td>
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<td>12</td>
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<tr>
<td>Indiana University South Bend</td>
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<td>15</td>
<td>$599.00</td>
<td>$22,163.00</td>
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<tr>
<td>Southern Illinois Edwardsville</td>
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<td>12</td>
<td>$600.00</td>
<td>$21,000.00</td>
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<tr>
<td>University of Wisconsin-Platteville</td>
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<td>15</td>
<td>$620.00</td>
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<td><strong>UWRF</strong></td>
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<td><strong>$655.00</strong></td>
<td><strong>$19,650.00</strong></td>
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<td>Grand Valley State</td>
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<tr>
<td>University of Wisconsin-La Crosse</td>
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<tr>
<td>University of St. Thomas</td>
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<td>13</td>
<td>$879.00</td>
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<tr>
<td>University of Minnesota - Twin Cities</td>
<td>31</td>
<td>12</td>
<td>$913.14</td>
<td>$28,307.34</td>
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<td>--------------------------------------</td>
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</tr>
<tr>
<td>Marquette University</td>
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<td>9</td>
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<td>$34,020.00</td>
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<tr>
<td>University of Wisconsin - Milwaukee</td>
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<td>11</td>
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<td>University of Wisconsin-Parkside</td>
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<td>13</td>
<td>$989.00</td>
<td>$29,670.00</td>
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<tr>
<td>Lamar University</td>
<td>37</td>
<td>11</td>
<td>$995.00</td>
<td>$36,815.00</td>
</tr>
</tbody>
</table>

10. **OUTSIDE CONSULTANTS’ REVIEWS**

9.7. List the names and affiliations of at least 2 outside consultants with no past or present ties to the proposed program. Send out request letters issued by the Provost/Vice Chancellor and set a deadline by which the reviews must be received. The review committee considers the results of the Outside Consultants’ review and makes suggestions to improve the program if appropriate.
To: Faculty Governance Bodies  
From: College of Business and Economics Department Chairs  
Subject: Master of Science in Computer Science  
Date: Wednesday, February 27, 2013

We, as the chairpersons of the various departments of the College of Business and Economics, strongly support the new proposal for the Master of Science in Computer Science (MSCS). The new program will meet students’ needs and contribute to the college’s long-term priorities and strategic plans.

The proposed program and the corresponding proposed curriculum will not be a duplicate of existing CBE programs including the part-time or the full-time MBA. We believe that the proposed graduate program will be an excellent addition to the existing graduate program and will benefit students as well as the college, the University and the community.

Sincerely,

Darryl Miller  
Chair  
Management & Marketing

Reza Rangozai  
Chair  
Accounting & Finance

Hamid Tabesh  
Chair  
Economics

George Dierberger  
Director  
part-time MBA & full-time MBA
Subject: Proposed Masters' Program in CS
Date: Wednesday, March 20, 2013 7:58:18 AM CT
From: Robert Coffman
To: Hossein Najafi

Dear Hossein,

Thanks for your patience as I finally get back to you.

Here is our department's official response to your proposal:

There is considerable overlap between CSIS 733: Computing for Computer Science and Big Data Analysis and MATH 327: Applied Regression Analysis. However, there are currently many combinations of overlapping statistics courses on campus. In the particular instance of overlap in question, the effect is inconsequential, due to the fact that CSIS 733 is a graduate course and MATH 327 is an undergraduate course.

Let me know if you have any further questions.

Good luck with your endeavor!

Bob Coffman, Chair
Department of Mathematics
University of Wisconsin - River Falls
(715) 425-3326
Subject: RE: Master of Science in Computer Science
Date: Thursday, March 14, 2013 6:01:20 PM CT
From: Kelly Cain
To: Hossein Najafi
CC: Logan Kelly, Ian Johnson, Michael Stifter, Stephen Reed

Dear Hossein,

I am thrilled to see this proposal for the curriculum and especially the significant sustainability-based context of one (or more) of its courses.

As you already know, the national and international momentum around the whole concept of Green IT is nothing short of revolutionary. While IT in general is obviously a major energy consumer, the reality of our ability as a nation to solve the myriad of sustainability drivers facing us is simply not possible without it, unless of course we would like to go back to Morse Code and rotary dial.

Our students will simply not be able to compete as effectively in the existing employment market, much less that of the future if we do not prepare them with the holistic systems approach of sustainability values, principles, and practices. Green IT is the literal backbone of the monitoring, performance, and management systems for complex infrastructure systems upon which we all depend. The real opportunity for our students in this arena is truly of disruptive entrepreneurial proportion.

I certainly pledge the support of the Office of Sustainability and the St. Croix Institute for Sustainable Community Development in providing whatever assistance we can in helping this course and curriculum to success.

Please do not hesitate to let me know how I can be of further service.

Sincerely,
Kelly

Kelly D. Cain, PhD, Director
St. Croix Institute for Sustainable Community Development
Professor, Environmental Science & Management
Kelly.d.cain@uwrf.edu
Office: 715-425-3479
www.uwrf.edu/sustain

UNIVERSITY OF WISCONSIN River Falls
GLOBAL. INNOVATIVE. EXCELLENT.

From: Hossein Najafi
Sent: Monday, March 11, 2013 1:53 PM
To: Kelly Cain
Cc: Logan Kelly
Subject: Master of Science in Computer Science