Contact: Rachel Boon

REQUEST FOR NEW PROGRAM AT IOWA STATE UNIVERSITY: BACHELOR OF SCIENCE IN ACTUARIAL SCIENCE

Action Requested: Consider approval of the request by Iowa State University to establish a Bachelor of Science in Actuarial Science in the Ivy College of Business.

Executive Summary: The Council of Provosts and Board office support approval of this program.

Background:
Description of proposed program. The proposed major in actuarial science will provide the initial training for students to become an actuary. According to the Society of Actuaries (SOA) website (https://www.soa.org/future-actuaries/what-is-an-actuary/),

"Actuaries measure and manage risk. Actuaries have a deep understanding of mathematics, statistics and business management. With this, they help businesses grow and provide value to their customers. Actuaries help leaders make strategic decisions and consumers prepare for their future. Actuaries are in demand. They work for and with businesses with a financial focus. Businesses including insurance-life, health, property-casualty, even pet insurance. Also, banking, investments, government, energy, e-commerce, marketing, employee benefits, product development, enterprise risk management, predictive analytics, consulting and more."

Students majoring in actuarial science will be students in the Ivy College of Business. The admission requirements will be the same as for all other majors. The curriculum will require 31 credits of general education coursework, 23 credits of foundation coursework, 21 credits of supporting courses, 24 credits of core coursework, and 25 credits of major coursework (124 total credits). The general education, foundation, supporting and core coursework is similar to that for other majors in the Ivy College of Business. The main differences relate to different mathematics requirements to prepare the students for the SOA/CAS preliminary exams. The 25 credits of major coursework are specific to the actuarial science major. This curriculum can be completed in eight semesters (four years) of full-time enrollment.

To achieve professional status as an actuary, individuals must pass the SOA/CAS preliminary exams and satisfy Validation by Education Experience (VEE) requirements. Three of the VEE requirements can be satisfied through the two economics courses and one account course taken for the major. The remaining requirements can be satisfied by taking three additional courses totaling 10 credits (one VEE course in finance, one in statistics, and one prerequisite course in mathematics). While these 10 credits of coursework are not required for the major, students will be encouraged to take these courses while a student at Iowa State University.

Academic objectives. The academic objectives of the program are twofold. First, students will acquire the knowledge base and skills in finance, mathematics and statistics needed to pass the five preliminary actuarial exams. Second, students will acquire the business-related skills necessary to be successful on the job when they become actuaries. These include the ability to understand how a business is organized and functions; communicate effectively in written, oral, visual and electronic modes; work in teams; make ethical choices; use quantitative and analytical methods to address unstructured business problems; think critically; understand financial statements; and understand markets and investments.

Need for proposed program. No program currently exists at Iowa State University that provides the full set of coursework desired by industry. The Departments of Mathematics and Statistics currently offer some of the courses needed to become an actuary, but students majoring in either of these two disciplines do not get the business background that is also desired by industry. Insurance products are by definition financial products that are sold and as such, actuaries need knowledge of accounting concepts, finance and financial investments, marketing concepts, etc. Currently, the only way a student can get this business knowledge is to add a double major in business, which is costly and time consuming. Creating an actuarial science major within the Ivy College of Business would eliminate this problem.

The need for a program came into focus through discussions that Dean David Spalding had with industry stakeholders. These discussions indicated that the demand for actuaries exceeded the supply currently available. In summer 2016, Dean Spalding appointed a task force to study the issue. The Task Force consulted with numerous members of the business community (insurance professionals and actuaries) to seek input. There was overwhelming enthusiasm that ISU should offer a comprehensive actuarial science program and that it should be part of a broad-based business education housed in the Ivy College of Business. In fact, professional actuaries repeatedly stressed to the Task Force the strong desirability of developing business-related knowledge and skills along with the ability to pass the actuarial exams.

Link to institutional strategic plan. The Ivy College of Business offers high-quality undergraduate, masters, and doctoral level programs, and has a number of nationally recognized research scholars and a strong research reputation in selected fields. The addition of this bachelor's level actuarial science program would make a significant contribution to the College's strategic goals. In fact, one of the items under Goal 1 of the Ivy College of Business' 2015-2020 strategic plan calls for "the establishment of new undergraduate majors, minors and certificates based on industry needs." Further, one of the items under Goal 2 of the plan is to "increase the number of interdisciplinary undergraduate and graduate programs in collaboration with other colleges on campus based on industry needs and/or academic trends." The Bachelor of Science in Actuarial Science program would further these goals by preparing students with a broad background in business and an advanced set of financial, mathematical, and statistical tools that are necessary for a successful career in actuarial science that addresses the challenges of today's complex insurance and financial sectors.

Relationship to existing programs at the institution. The foundation, supporting and core business classes required for the actuarial science major are already being taught in the Ivy College of Business, as are most of the finance courses required for the program. The statistics courses required are currently being taught, as are most of the required mathematics courses. Five new courses specifically needed to prepare the students for the SOA/CAS preliminary exams will need to be developed. Three of these courses will be taught by Ivy College of Business faculty in the Department of Finance and two will be taught by faculty from the Department of Mathematics.

The Departments of Mathematics and Statistics currently offer courses to help prepare students for careers as actuaries. However, students majoring in these two disciplines do not get the broad based business knowledge industry desires. Currently, the only way to obtain that depth of knowledge is to double major in mathematics or statistics and business. This is time consuming and costly for the students and is not efficient. In addition, some courses needed to provide the education required to pass the preliminary SOS/CAS exams are not currently offered. Creating a major in actuarial science within the Ivy College of Business in partnership with the Departments of Mathematics and Statistics will solve these problems. All students will take the business

foundation, supporting, and core courses to give them the broad based business background desired. They will also take courses in the major in finance, mathematics, and statistics to prepare them to pass the SOA/CAS preliminary exams.

Relationship to existing programs at other colleges and universities. The University of Iowa has an actuarial science program in the Department of Statistics and Actuarial Science, and the University of Northern Iowa has a program in the Department of Mathematics. Neither program requires the broad foundation in business that the insurance industry indicated is strongly desired. Drake University has an actuarial science program located in the College of Business. However, Drake University is a private university with high tuition (currently $19,458 per semester for students entering in the 2017-18 academic year), making it unaffordable for many students.

The Ivy College of Business and the Departments of Mathematics and Statistics are well positioned to deliver high-quality actuarial science education. The Ivy College of Business has an excellent reputation with both industry and students and does well in national rankings. The Departments of Mathematics and Statistics have excellent reputations and are highly ranked as well. In all cases, most of our tenure-track faculty are active researchers and continue to contribute to their field of expertise, which ensures they stay up-to-date with current trends in industry.

Unique features. Iowa State University is the perfect home for the proposed Bachelor of Science in Actuarial Science program. It is close to Des Moines, the second largest insurance center in the United States. This creates a ready and easily accessible market for our students. The close proximity of this market makes it easy to maintain contact with the companies hiring graduates and to stay up-to-date on current changes in the industry which might affect the program.

Resources to establish a high-quality program. Most of the courses required for the actuarial science major already exist at Iowa State University and are taught by highly qualified faculty in the Ivy College of Business and the Departments of Mathematics and Statistics. The Ivy College of Business hired Dr. Rahul Parsa in the fall of 2015. Dr. Parsa was formerly the Director of the Actuarial Science Program at Drake University. He has over 15 years of experience in teaching actuarial science courses and was recently joined the examination committee for the Casualty Actuarial Society. He will be the lead faculty member for the program.

Five new courses will be required for the actuarial science program. Three of them will be taught by faculty in the Ivy College of Business Finance Department, and two by faculty in the Department of Mathematics. Dr. Parsa will be teaching two of the three new courses in the Ivy College of Business while the remaining Ivy College of Business course will be taught by an existing faculty member in the Department of Finance. The Department of Mathematics may need to hire a faculty member to teach the two new Life Contingency courses. This is dependent on the load of the existing faculty, which could change due to anticipated student growth at the university by the time the major is implemented and the two Life Contingency courses that are required. The Department of Mathematics has indicated willingness to staff these courses. As demand for the actuarial science major increases, additional sections of courses may need to be opened to accommodate growth. The tuition revenue received from the program should be adequate to hire the necessary faculty.

The Ivy College of Business is housed in the 13-year-old Gerdin Business Building which is equipped with state-of-the-art research and instructional technology. Other than faculty and classroom space, the resources needed to teach the program are computer hardware and software. These resources are already available in the Gerdin Business Building.

Student demand. High school students often inquire whether an actuarial science program exists within the Ivy College of Business. In fact, on the latest PSAT Test Taker survey, interest in actuarial science has increased by 143% over the last six years. While interest in actuarial science is still lower than it is for other business majors, interest appears to be rising.

Enrollment in actuarial science at Drake University supports this information. Drake University has over 300 students in the program (almost 10% of the student body and 1/3rd of the college). It is a private university with very high tuition, which makes it unaffordable for many Iowa students, a group that Iowa State University predominantly serves. Iowa State University undergraduate business student tuition is among the lowest of our peers. The low cost and high quality of the proposed program at Iowa State University should make it very attractive to both in-state and out-of-state students. In addition, Dr. Rahul Parsa was formerly the Director of the Actuarial Science Program at Drake University and played a major role in the recruitment efforts at Drake University.

Workforce need/demand. Actuaries are highly sought after and actuarial jobs rank among the best jobs in the country. According to the Bureau of Labor Statistics, the number of jobs for actuaries in 2014 was 24,600. This demand is projected to grow by 18% over the next 10 years, bringing the total number of jobs in the U.S. for actuaries to 29,028. This far exceeds the average growth rate for all occupations of 7%. While the total number of jobs is not large, the demand for actuaries will exceed that amount due to individuals being promoted to upper level management positions or leaving actuarial jobs for opportunities elsewhere.

High demand growth for actuaries is expected in Iowa as well. In fact, according to the *Metrics That Matter 2017* report prepared for The Future Ready Iowa Alliance, actuaries is expected to be one of the fastest growing occupations (in percentage terms) in Iowa for those positions requiring additional education beyond high school and having entry level wages higher than $16.00 per hour. In addition, the report indicates the entry-level wage for actuaries in Iowa is $29.78 per hour and the median hourly wage is $43.75 per hour. This median wage is the second highest of the 11 fastest growing occupations listed.

Since actuarial jobs tend to be concentrated in cities such as Des Moines that have a high concentration of insurance companies, meetings were held with a number of major insurance employers, most of whom are in Des Moines, to gauge demand for this type of degree program. These employers included Athene USA, EMC Insurance Companies, Principal Financial Group, PricewaterhouseCoopers LLP, Fidelity & Guaranty Life Insurance Company and LTCG. The proposed program was outlined and feedback requested on the perceived demand for such a skill set. The responses ranged from positive to enthusiastic. One company indicated it has approximately 20 open positions for actuaries at any one time.

Cost.

	TOTAL COSTS	TOTAL NEW COSTS
Year 1	$15,000	$15,000
Year 2	$15,000	$0
Year 3	$110,625	$95,625
Year 4	$110,625	$0
Year 5	$110,625	$0
Year 6	$110,625	$0
Year 7	$110,625	$0

Projected enrollment.

Undergraduate	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7
Majors	15	40	80	120	150	165	170
Non-Majors	0	0	0	0	0	0	0

Anticipated sources of students. Students will be actively recruited for the major as part of the normal recruitment process for the Ivy College of Business. Details on the actuarial science major will be included in all marketing materials and on the website. Students will be recruited from high schools throughout Iowa and the surrounding states to make sure prospective students are aware of the new major. Students already at Iowa State University will also be made aware of the program. It is possible that students currently majoring in finance, mathematics or statistics may be interested in these new courses.

Articulation agreements. In order to finish the actuarial science major in four years and take the preliminary exams as planned, it is imperative that students start the program immediately upon matriculation at Iowa State University. Thus, no articulation agreements are planned with programs at community colleges or other four-year institutions. The College will continue to honor any course level articulation agreements with community colleges that are in place at Iowa State University. In addition, if students from a community college or other four-year institutions want to transfer to Iowa State University and major in actuarial science, they are welcome to do so. However, it is unlikely they would be able to finish the major in a total of four years (i.e., time from when they started their degree elsewhere to finishing the actuarial science major at Iowa State University).

Accreditation. The actuarial science major will be included as part of our business programs to be reviewed by the Association to Advance Collegiate Schools of Business (AACSB) at the next Continuous Improvement Review (during the 2019-2020 academic year). Once the major is well established, there will be discussions with industry partners and members of our Ivy College of Business advisory councils whether pursuit of additional accreditations is worthwhile.

Evaluation plan. Student recruitment and enrollment will be monitored by the Associate Dean for Undergraduate Programs to ensure enrollment objectives are being met. Assessment of learning outcomes will be monitored to ensure students are meeting the desired learning objectives and for continual improvement of the program. The percent of students sitting for and passing the preliminary exams will be monitored to ensure students are ready for internships and full time positions as actuaries. Student internships and student placement will be monitored to evaluate the success of the program with respect to job placement.

Date of implementation. August 2018

Letters of Support

College of Humanities, Arts and Sciences
Office of the Dean

University of Northern Iowa

January 26, 2018

Ann Marie VanDerZanden
Associate Provost for Academic Programs
Iowa State University

Dr. VanDerZanden:

Thank you for sharing your plans for a new BS program in Actuarial Science. Although we have concerns that a fourth Actuarial Science program in the state will negatively impact enrollments in the existing programs, we understand and appreciate your effort to craft a unique space by housing the program in your Business College rather than in Mathematics. We also recognize the strong support from the business community near your campus. Therefore, we have no objection to your proposals and wish you success.

Sincerely,

John Fritch
Dean, College of Humanities, Arts and Sciences
Professor, Communication Studies

Cc: David Spalding, Dean

Rahul Parsa
Patrick Pease

THE UNIVERSITY OF IOWA

CAE Center of Actuarial Excellence
SOCIETY OF ACTUARIES

COLLEGE OF
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Department of Statistics & Actuarial Science
241 Schaeffer Hall
Iowa City, Iowa 52242-1409
319-335-0712 *Fax* 319-335-3017
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January 12, 2018

As chair of the Department of Statistics and Actuarial Science, at the University of Iowa, I support the proposal for an Actuarial Science undergraduate degree program to be offered by the College of Business at Iowa State University.

The demand for actuaries continues to grow in the state and across the globe. Therefore, I support any effort to promote the profession and to attract good students to the discipline. An increase in the number of training programs in the state (and across the globe) will, in the long-run, be a positive development and will contribute to this effort. The ISU actuarial science program will not affect UI's actuarial science program negatively.

I wish you all the best with your proposal.

Sincerely,

Joseph B. Lang
Professor and Chair
Department of Statistics and Actuarial Science
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