



**University Senate  
TRANSMITTAL FORM**

<b>Senate Document #:</b>	13-14-22
<b>PCC ID #:</b>	13031
<b>Title:</b>	Proposal to Establish a Master of Science in Information Systems
<b>Presenter:</b>	Marilee Lindemann, Chair, Senate Programs, Curricula, and Courses Committee
<b>Date of SEC Review:</b>	January 31, 2014
<b>Date of Senate Review:</b>	February 5, 2014
<b>Voting (highlight one):</b>	<ol style="list-style-type: none"> <li>1. On resolutions or recommendations one by one, or</li> <li>2. In a single vote</li> <li>3. To endorse entire report</li> </ol>
<b>Statement of Issue:</b>	<p>The Robert H. Smith School of Business proposes to take its existing Master of Science in Business area of concentration in Information Systems Management and reclassify it as its own, stand-alone degree program, the Master of Science in Information Systems. The context of the Master of Science in Business is important for understanding this proposal. Designed to provide an alternative to the generalist approach of the Master of Business Administration, the Master of Science in Business was created in 1978 to allow students to specialize in an academic field within business and management. Consequently, the Master of Science in Business has a structure that is uncommon for campus degree programs that have areas of concentration. The Master of Science of Business does not have a set of core requirements that is shared by each area of concentration. The curriculum of each area of concentration focuses on its own content; thus, the curriculum of the Information Systems Management area of concentration is comprised entirely of information systems courses. Last year, a proposal to convert the concentration in Finance to its own degree program was approved. This proposal is a continuation of the effort to separate some of the MS in Business concentrations into their own degree programs.</p> <p>In the past, the structure of the Master of Science in Business was sufficient for the purposes of the area of concentration in Information Systems. In recent years, however, it has become apparent that this structure poses unnecessary limitations for students, staff and faculty. Currently, the diploma only indicates</p>

	<p>the Master of Science in Business, not the actual focus of the curriculum. The general degree name also puts the School of Business at a competitive disadvantage when trying to attract students who are strongly interested in a degree in Information Systems. Students and alumni have overwhelmingly expressed their desire for the degree name to accurately represent the focus of their coursework.</p> <p>By having a separate program as opposed to a concentration, students will now be able to pursue multiple areas in business (i.e., they will be able to pursue two business MS degrees at UM because the program names will now be different). Furthermore, the tuition rate will no longer be tied to the tuition rate of the MS in Business, and can be lowered or raised depending on market demand.</p> <p>Other than reclassifying the area of concentration as its own degree program, there are no other changes proposed. The new degree program will continue to be administered in the same manner as the area of concentration had been in the past, with the same faculty responsible for oversight. The curriculum will also remain the same. Consequently, there is no need for additional resources as a result of the proposed action.</p> <p>The Graduate PCC Committee approved the proposal on January 27, 2014. The Senate PCC committee approved the proposal at its meeting on December 6, 2013.</p>
<b>Relevant Policy # &amp; URL:</b>	N/A
<b>Recommendation:</b>	The Senate Committee on Programs, Curricula, and Courses recommends that the Senate approve this new degree program.
<b>Committee Work:</b>	The Committee considered the proposal at its meeting on December 6, 2013. Anil Gupta, Professor, Robert H. Smith School of Business, and Michael Marcellino, Assistant Dean, Robert H. Smith School of Business, presented the proposal. After discussion, the Committee voted unanimously to recommend the proposal.
<b>Alternatives:</b>	The Senate could decline to approve this new degree program.
<b>Risks:</b>	If the Senate does not approve reclassifying the area of concentration as a degree program, the program and the students will continue to be at a disadvantage because of the generic name of their degree program.
<b>Financial Implications:</b>	There are no significant financial implications with this proposal.
<b>Further Approvals Required:</b> <i>(*Important for PCC Items)</i>	If the Senate approves this proposal, it would still require further approval by the President, the Board of Regents, and the Maryland Higher Education Commission.

**THE UNIVERSITY OF MARYLAND, COLLEGE PARK  
PROGRAM/CURRICULUM/UNIT PROPOSAL**

- Please email the rest of the proposal as an MSWord attachment to [pcc-submissions@umd.edu](mailto:pcc-submissions@umd.edu).

PCC LOG NO.

13031

- Please submit the signed form to the Office of the Associate Provost for Academic Planning and Programs, 1119 Main Administration Building, Campus.

**College/School: Robert H. Smith School of Business**

Please also add College/School Unit Code-First 8 digits: 01202900

Unit Codes can be found at: [https://hypprod.umd.edu/Html\\_Reports/units.htm](https://hypprod.umd.edu/Html_Reports/units.htm)

**Department/Program: Robert H. Smith School of Business**

Please also add Department/Program Unit Code-Last 7 digits: 1290101

**Type of Action (choose one):**

- |   |   |
|---|---|
| <input type="checkbox"/> Curriculum change (including informal specializations)     | <input checked="" type="checkbox"/> <i>New academic degree/award program</i>        |
| <input type="checkbox"/> Curriculum change for an LEP Program                       | <input type="checkbox"/> New Professional Studies award iteration                   |
| <input type="checkbox"/> <i>Renaming of program or formal Area of Concentration</i> | <input type="checkbox"/> New Minor  |
| <input type="checkbox"/> <i>Addition/deletion of formal Area of Concentration</i>   | <input type="checkbox"/> Request to create an online version of an existing program |
| <input type="checkbox"/> <i>Suspend/delete program</i>                              |   |

*Italics indicate that the proposed program action must be presented to the full University Senate for consideration.*

**Summary of Proposed Action:**

Convert Master of Science in Business and Management - Information Systems Concentration to a Master of Science in Information Systems

**Departmental/Unit Contact Person for Proposal:** \_\_\_\_\_

=====

APPROVAL SIGNATURES - *Please print name, sign, and date. Use additional lines for multi-unit programs.*

1. Department Committee Chair \_\_\_\_\_

2. Department Chair \_\_\_\_\_

3. College/School PCC Chair \_\_\_\_\_

4. Dean \_\_\_\_\_

5. Dean of the Graduate School (if required) \_\_\_\_\_

6. Chair, Senate PCC Manee Fair 12/6/13

7. University Senate Chair (if required) \_\_\_\_\_

8. Senior Vice President and Provost \_\_\_\_\_

**THE UNIVERSITY OF MARYLAND, COLLEGE PARK  
PROGRAM/CURRICULUM/UNIT PROPOSAL**

- Please email the rest of the proposal as an MS Word attachment to [pcc-submissions@umd.edu](mailto:pcc-submissions@umd.edu).

PCC LOG NO.

**13031**

- Please submit the signed form to the Office of the Associate Provost for Academic Planning and Programs, 1119 Main Administration Building, Campus.

**College/School:**

Please also add College/School Unit Code-First 8 digits: **01202900**

Unit Codes can be found at: <https://hypprod.umd.edu/Html/Reports/units.htm>

**Department/Program:**

Please also add Department/Program Unit Code-Last 7 digits: 1291101

**Type of Action (choose one):**


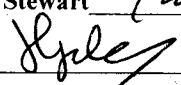
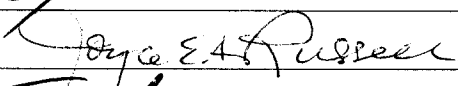

- |  |   |
|--|---|
| <input type="checkbox"/> Curriculum change (including informal specializations)                | <input type="checkbox"/> <i>New academic degree/award program</i> |
| <input checked="" type="checkbox"/> <i>Renaming of program or formal Area of Concentration</i> | <input type="checkbox"/> New Professional Studies award iteration |
| <input type="checkbox"/> <i>Addition/deletion of formal Area of Concentration</i>              | <input type="checkbox"/> New Minor                                |
| <input type="checkbox"/> <i>Suspend/delete program</i>   | <input type="checkbox"/> Other                                    |

*Italics indicate that the proposed program action must be presented to the full University Senate for consideration.*

**Summary of Proposed Action:**

The Robert H Smith School of Business (School) proposes launching a Master of Science in Information Systems (MS in IS) program designed to provide students with a rigorous understanding of and the ability to apply core Information Systems principles and techniques. There is a growing need for individuals who have the expertise to use sophisticated tools to design systems and analyze data in meaningful ways. Students who complete the MSIS degree will possess the knowledge and skills necessary to address these challenges. The school currently offers a Master's of Science in Business and Management with a concentration in Information Systems. Unfortunately, there is no distinction between the concentrations on the diplomas or transcripts and we are limited in our ability to treat the programs differently. The creation of this formal degree program will provide us with an opportunity to better reflect the degree being earned and provide us with the ability to align our administrative activities with the market demands.

APPROVAL SIGNATURES - Please print name, sign, and date. Use additional lines for multi-unit programs.

1. Department Committee Chair Katherine Stewart 
2. Department Chair Zhi-Long Chen 
3. College/School PCC Chair Joyce Russell 
4. Dean Alexander Triantis 
5. Dean of the Graduate School (if required) \_\_\_\_\_
6. Chair, Senate PCC \_\_\_\_\_
7. University Senate Chair (if required) \_\_\_\_\_
8. Senior Vice President & Provost \_\_\_\_\_

To: Betsy Beise

From: Anil Gupta

Subject: Degree name changes for MS in Business and Management

Dear Betsy:

The Smith School currently offers multiple internationally competitive Master of Science in Business degrees, including concentrations in Accounting, Information Systems, Marketing Analytics, and Supply Chain Management. The attached proposals are being submitted to request that we change the name of our current MS degree with concentrations to individual Masters of Science degrees. Offering degrees with the specific titles will better articulate the credentials of graduating students on the diploma and make them more competitive in all markets. The adjustment of these degree names will also provide us with an opportunity to align our administrative activities with the market demands instead of treating them in a similar manner.

We are submitting these proposals as a package for administrative efficiency. We felt this might be a more convenient approach since many of the questions raised will likely be applied to all four programs. If this approach is undesirable, we are certainly prepared to discuss them individually as well.

Please let us know if you need additional information or have any questions.

Sincerely,

Dr. Anil K. Gupta

Michael D. Dingman Chair & Professor of Strategy, Globalization & Entrepreneurship  
Smith School of Business, The University of Maryland

Email: [agupta@rhsmith.umd.edu](mailto:agupta@rhsmith.umd.edu)

Office: 301.405.2221

PROPOSAL FOR  
NEW INSTRUCTIONAL PROGRAM  
UNIVERSITY OF MARYLAND AT COLLEGE PARK, MARYLAND  
MASTER OF SCIENCE IN INFORMATION SYSTEMS (MSIS)

ROBERT H. SMITH SCHOOL OF BUSINESS

DEAN Alexander J. Triantis

**MASTER OF SCIENCE IN INFORMATION SYSTEMS**

---

Award to be offered Fall 2014

## **I. OVERVIEW and RATIONALE**

**A. Briefly describe the nature of the proposed program and explain why the institution should offer it. [You may want to refer to student demand, market demand for graduates, institutional strengths, disciplinary trends, synergy with existing programs, and/or institutional strategic priorities.]**

### **Goal and Contribution to the Strategic Plan**

The Robert H. Smith School of Business proposes launching a Master of Science in Information Systems (MSIS) program designed to provide students with a rigorous understanding of and the ability to apply core Information Systems principles and techniques. Information is a strategic asset to any organization. How information is organized, managed, and made available to decision makers can be the key to an organization's success or failure. The proliferation of data and ever-increasing power of computing technologies drives a growing need for individuals who have the expertise to use sophisticated tools to design systems and analyze data in meaningful ways. Students who complete the MSIS degree will possess the knowledge and skills necessary to address these challenges.

The Robert H. Smith School of Business houses one of the strongest academic Information Systems departments in the world (consistently ranked in the top 10 by U.S. News and World Report) as well as two research centers focused on the application of information technology in healthcare (CHIDS) and the role of IT in spurring innovation and creating new business models (DIGITS). The department of decision, operations, and information technology (DO&IT) also includes renowned faculty in management science and statistics, which facilitates a strong quantitative focus in the MSIS degree. The research and experience of the faculty are particularly suited to attract some of the brightest students in the world who are seeking a more thorough understanding of information systems. Faculty and staff currently affiliated with the Robert H. Smith School of Business hold appropriate degrees in information systems and related disciplines that are relevant and necessary for the Master of Science in Information Systems degree.

The strategic plan of the Robert H. Smith School of Business states as its first objective the goal of "Growing future leaders to address global issues." The University of Maryland College Park mission statement sets a goal to "continue to build a strong, university-wide culture of graduate and professional education" and to provide knowledge-based programs and services that are responsive to the needs of the citizens of the state and the nation. Faculty and students in the Master of Science in Information Systems program will collaborate with institutions at the state, national, and international level to address challenging problems in information systems design, development, and application. Given the MSIS faculty's connections to many multinational corporations as well as government agencies and UMCP's location in one of the strongest IT regions in the United States, we are in a unique position to offer students opportunities unmatched by competitor institutions.

The School currently offers a Masters of Science in Business with a concentration in Information Systems (MSB/IS). However, the diploma does not state the phrase "Information Systems" on

it. This degree name will strengthen the recognition of the degree and increase its attractiveness to a worldwide applicant pool. Offering a degree with the word Information Systems in the title will clarify the content of the knowledge our students obtain. The creation of this degree will also provide greater opportunities to be flexible within our portfolio of Masters of Science degrees to uniquely address issues within each discipline rather than pooling all of them under the same Masters of Science in Business degree that is currently offered.

The School currently offers a joint MBA-MSB/IS program for students and we would also seek to offer students the opportunity to enroll in a joint MBA-MSIS program. Such an opportunity enables our MBA students to further distinguish themselves in the MBA marketplace and the fact that the joint program would likewise have the phrase "Information Systems" in it would improve our ability to market these students.

Similarly, the Smith School currently offers a Certificate in Cybersecurity Leadership program, and students who complete that program and successfully gain admission to the MSB/IS may count up to 9 credits toward the MSB degree. We would seek to offer this same opportunity for students seeking entrance to the MSIS program.

This program is also an ideal path for some of our students to pursue PhD programs in Information Systems. Two current MSB/IS students have expressed an interest in going on to PhD programs, and they have been working with the Academic Director to position themselves to apply for PhD programs. Having the program entitled Master of Science in Information Systems will likely improve the marketability of our students seeking to pursue a PhD specializing in Information Systems.

### **Market Demand for Graduates**

Graduates from this program will have strong quantitative skills and knowledge of information technology that will position them to meet the increasing need for employees trained in STEM (Science, Technology, Engineering, and Math) disciplines. While the need for technology skills among information systems professionals is obvious, the modern information systems graduate increasingly needs significant mathematical knowledge as well, e.g., to understand how to manage and analyze copious amounts of data available to business and government enterprises. A unique strength of the proposed MSIS program is that it is structured to provide both technical skills (through courses such as Database Management, Data Networks and Infrastructures, Business Process Analysis for Information Systems, IS Security), and also build quantitative skills through a set of courses focused on business analytics (e.g., Data Models, Data Mining, Computer Simulation, Decision Analytics).

The number of information systems management and professional opportunities has consistently increased faster than most other employment opportunities. The Bureau of Labor Statistics states: "Employment of computer and information systems managers is expected to grow 17 percent over the 2008-18 decade, which is faster than the average for all occupations. New applications of technology in the workplace will continue to drive demand for workers." *Forbes* magazine lists the Master's in Information Systems as the 4th best Master's degree to obtain (tied with Mathematics), projecting the mid-career median compensation to be \$95,500. *Forbes* also



projects the employment increase for jobs associated with this degree to be over 23% over the period from 2012 to 2023.

## **Student Demand**

Business schools are undergoing a significant shift in the applicant pool for Master's degree programs. Applications for traditional MBA programs that provide a general management focus have seen a sustained reduction nationwide. Contemporaneously, more students are seeking Master's degrees that specialize in a particular business field, including Information Systems. In addition to the MSB/IS program that we launched in 2011, several competing institutions including Carnegie Mellon University, Indiana University, and New York University are similarly offering Master's degree programs in Information Systems. Such degrees are becoming an increasingly common offering at peer and aspirational institutions.

Student demand for a Master's in Information Systems program is strong and growing. For the first cohort that entered in 2011, we received 105 applications. For the 2012 class, we received 265 applications, and as of Feb 1, 2013 we had already received 304 applications for the Fall 2013 class. Applicant statistics demonstrate the quality of students demanding this offering: thus far, applicants for Fall 2013 have an average GMAT of 683, an average GPA of 3.5, and an average of 1 year of work experience.

### **B. How big is the program expected to be? From what other programs serving current students, or from what new populations of potential students, onsite or offsite, are you expecting to draw?**

AY 2012/2013 enrollment in our MS Business with a concentration in Information Systems (MSB/IS) was 72 newly admitted students. For AY 2013/2014 we plan to limit enrollment to a maximum of 60 in order to better manage resource demands and the quality of the student experience. We anticipate that students enrolled in the MSB/IS program will all instead enroll in the MSIS program. Therefore, enrollment should remain at the current 60 student class size after creating the Master of Science in Information Systems degree. Given increasing demand, we may add another cohort beginning in AY 2014/2015 or later, increasing the entering class to 120 students.

Students take 30 credits in the program. Students typically complete the degree requirements within 2 years, allowing them to seek an internship opportunity after the first year. Students who desire to complete the program in one academic year may do so by taking a heavier course load.

Most of the students we attract to this program are international, primarily from Asia. The strategic plan for this program seeks to expand domestic enrollment, primarily by targeting students receiving Bachelor's degrees in quantitative or technical areas (e.g., engineering, computer science) who are looking for an opportunity to expand their knowledge of information systems to enhance their career prospects.

## **II. CURRICULUM**

**A. Provide a full catalog description of the proposed program, including educational objectives and any areas of concentration.**

The Masters of Science in Information Systems degree (MSIS) is a professional degree for students wishing to pursue careers in Information Systems design, development, consulting or related fields. Core courses focus on building technology and quantitative skills, providing excellent fundamental knowledge of information systems concepts and business analytics techniques. Students may select from a small number of targeted electives to deepen their knowledge of core areas. They will learn how to analyze and direct the information systems decisions of an organization, how to use advanced statistical techniques to analyze data to inform decision-making, and gain a fresh understanding and a deep appreciation for the theoretical foundations of Information Systems today.

The proposed MSIS program offered by the Robert H Smith School of Business will provide students with:

- a) Strong foundational understanding of information technology and quantitative approaches to decision-making.
- b) Comprehensive knowledge of concepts necessary for engaging in any information systems project.
- c) In-depth understanding of techniques to analyze organizational processes from a systems perspective.
- d) The ability to design and leverage database structures necessary for managing organizations' information.
- e) The project management skills and abilities to effectively plan and manage projects that meet their organization's business goals.
- f) Analytical skills including a strong understanding of statistics.
- g) Knowledge of the legal and ethical issues related to information systems management and an understanding of the role of all stakeholders when information systems decisions are made.
- h) Expertise in information systems and business analytics that will make our students valuable contributors to a variety of employers and organizations in diverse communities.

**B. List the courses (number, title, semester credit hours) that would constitute the requirements and other components of the proposed program. Provide a catalog description for any courses that will be newly developed or substantially modified for the program.**

Students will enter the MSIS program with a Bachelor's degree. The proposed MSIS program requires 30 credit hours comprised of core courses (21 credits) and electives (at least 9 credits). Completion of the degree will typically be achieved within 2 years, but is feasible within 1 or 1.5 academic years for students who wish to accelerate the program.

While not required, some students may pursue the option of writing a master's thesis as part of reaching their 30 credit hours requirement. Others may take advantage of experiential learning opportunities for course credit. In both cases, such credit would be limited to 6 credit hours, be

overseen by a faculty member, and follow the Graduate School's guidelines for the Master's degree.

### **Core Courses**

**BUSI 621 Strategic and Transformational IT (2 credits):** Introduces students to the key issues in managing information technology (IT) and provides an overview of how major IT applications in today's firms support strategic, operational, and tactical decisions. Topics include: synchronizing IT and business strategy; the transformational impacts of IT; evaluating and coping with new technologies; governing, managing, and organizing the IT function including outsourcing/offshoring considerations; assessing the business value of IT and justifying IT projects; and managing IT applications in functional areas to support strategy and business process.

**BUSI 622 Managing Digital Business Markets (2 credits):** Introduces students to the strategic and tactical issues involved in managing digital businesses and markets. Explores some of the characteristics of digital businesses and markets that make them unique to develop an understanding of how companies can best manage them.

**BUSI 785 Project Management in Dynamic Environments (2 credits):** Addresses project management skills that are required by successful managers in increasingly competitive and faster-moving environments. Examines fundamental concepts of successful project management, and the technical and managerial issues, methods, and techniques.

**BUDT 703 Business Process Analysis for Information Systems (3 credits):** Helps students gain a solid foundation in the concepts, processes, tools, and techniques needed in analyzing business processes and conducting information systems projects.

**BUDT 704 Database Management Systems (3 credits):** Introduction to the conceptual and logical design of relational database systems and their use in business environments. Topics include information modeling and optimization via normalization; Structured Query Language (SQL); Client/Server architectures; Concurrency & Recovery; Data Warehousing.

**BUDT 758 Data, Models, and Decisions (3 credits):** Analytical modeling of business decisions; uncertainty, risk and expected utility; regression modeling to infer relationships among variables.

**BUDT 705 Data Networks and Infrastructures (3 credits):** Technical and managerial aspects of business data communications, networking, and telecommunications with a particular emphasis on internet-based technologies and services. Content includes history and structure of the telecommunications industry, including key legislative, regulatory and legal milestones, and management of the technical and functional components of telecommunications and data communications technology.

**BUDT 758 Information Systems Project (3 credits):** Students apply concepts and techniques learned in core courses to complete a project fulfilling some real business requirements.

## Elective Courses

In addition to these information systems and business analytics electives, and upon approval of the academic advisor, students may take up to three credits in a related field. Students must select at least 2 electives from set 1.

### Set 1:

BUDT 758 Data Mining and Predictive Analytics (3 credits): Data mining techniques and their use in business decision making. A hands-on course that provides an understanding of the key methods of data visualization, exploration, classification, prediction, time series forecasting, and clustering.

BUDT 758 Decision Analytics (3 credits): Analytical modeling for managerial decisions using a spreadsheet environment. Includes linear and nonlinear optimization models, decision making under uncertainty and simulation models.

BUDT 758 Computer Simulation for Business Applications (3 credits): This course covers the basic techniques for computer simulation modeling and analysis of discrete-event systems. Course emphasis is on conceptualizing abstract models of real-world systems (for example, inventory or queuing systems), implementing simulations in special purpose software, planning simulation studies, and analyzing simulation output.

### Set 2:

BUDT 758 IS Security (3 credits): Provides students foundational knowledge of information systems security threats, risk assessment, and approaches to ensuring security.

BUDT 758 Data Processing in Python (3 credits): Covers core concepts and techniques in designing and building software programs to support business requirements.

BUDT 758 Special topics in Decision, Operations, and Information Technologies (credits may vary)

BUDT 759 Independent Study in Decision, Operations, and Information Technologies (credits may vary)

## Sample Student Schedules

Below are tables showing how a typical MSIS student can complete the required coursework over two, three, or four regular semesters.

### Sample Student Schedule for MSIS, completed in two semesters.

Fall	Spring
BUSI 621 Strategic and Transformational IT	BUDT 703 Business Process Analysis
BUSI 622 Managing Digital Business Markets	BUDT 758 Data Mining
BUSI 785 Project Management	BUDT 758 Decision Analytics

BUDT 704 Database Management BUDT 758 Data Models BUDT 705 Data Networks and Infrastructures	BUDT 758 IS Security BUDT 740 IS Projects
--	--

**Sample Student Schedule for MSIS, completed in 3 semesters**

	Fall	Spring
First Year	BUSI 622 Managing Digital Business Markets BUDT 704 Database Management BUDT 758 Data Models BUDT 705 Data Networks and Infrastructures	BUDT 703 Business Process Analysis BUDT 758 Data Mining BUDT 758 Decision Analytics BUDT 758 IS Security
Second Year	BUSI 621 Strategic and Transformational IT BUSI 785 Project Management BUDT 740 IS Projects	

**Sample Student Schedule for MSIS, completed in 4 semesters**

	Fall	Spring
First Year	BUSI 622 Managing Digital Business Markets BUDT 704 Database Management BUDT 758 Data Models	BUDT 703 Business Process Analysis BUDT 758 Data Mining BUDT 758 Decision Analytics
Second Year	BUDT 705 Data Networks and Infrastructures BUSI 621 Strategic and Transformational IT BUSI 785 Project Management BUDT 758 Data Processing in Python	BUDT 740 IS Projects

**C. Describe any selective admissions policy or special criteria for students selecting this field of study.**

Applicants to the MSIS program must have completed all of the requirements for a baccalaureate degree prior to their acceptance into the program, with particular emphasis on the student having sufficient quantitative and technical background. All applicants must submit: Transcripts from all undergraduate and graduate institutions that have been previously attended, Graduate Record Examination (GRE) scores or the Graduate Management Admissions Test (GMAT) scores, a complete online application form that includes a written essay articulating qualifications and motivation for pursuing advanced education, two letters of recommendation from supervisors or from professors competent to judge the applicant's probability of success in graduate school.

In addition, an admissions interview may be required. After initial screening, the Admissions Office may select candidates for interviews which may be done in person or by telephone. Proof of English language proficiency (TOEFL or IELTS official scores) is also required unless the applicant has received an undergraduate or graduate degree from a select list of countries. For international student needing an F1 visa, a completed certification of finance form and supporting financial documentation are required.

In addition to Graduate School requirements, admission decisions for the MSIS program will be based on the quality of previous undergraduate and graduate course work (if applicable), the strength of Graduate Record Examination scores or the Graduate Management Admissions Test scores, the relevance of prior work and research experience, and the congruence of professional goals with those of the program. Students should submit application materials for the fall semester by April 1. This program does not accept applications for Spring semester admission.

### **III. STUDENT LEARNING OUTCOMES AND ASSESSMENT**

#### **List the program's learning outcomes and explain how they will be measured and assessed**

The Masters of Science in Information Systems degree is designed to provide students a solid foundation in information systems analysis, design, management, and application, with a focus on building quantitative analytical skills. This is reflected in the following learning outcomes.

**Learning Outcome 1** Students will demonstrate a clear understanding of the basic concepts of systems analysis and design, database management, information systems strategy, and technology-enabled business models.  
Measure: Students will be required to pass a core set of classes in these areas.  
Criterion: At least 90% of students will receive a rating of "Satisfactory" or better based on a review of their performance in the core classes. The Academic Director will advise students rated below "Satisfactory" to help improve their performance or determine their continued participation in the program.  
Assessment: Every Year, starting in the 2013-2014 academic year.

**Learning Outcome 2** Students will demonstrate critical reasoning and written communication skills through the analysis of information systems case studies.  
Measure: Students must take at least one class that uses the case study method.  
Criterion: At least 90% of students will receive a rating of "Satisfactory" or better from the course instructor.  
Assessment: Every Year, starting in the 2013-2014 academic year.

**Learning Outcome 3** Students will demonstrate oral communication skills through the presentation of an information systems case study.  
Measure: Students must make at least one presentation of a case study.  
Criterion: At least 90% of students will receive a rating of "Satisfactory" or better from the course instructor.

Assessment: Every Year, starting in the 2013-2014 academic year.

**Learning Outcome 4** Students will demonstrate their ability to work effectively with other members of a team in the preparation of a group project.

Measure: Students must prepare group projects as part of a class.

Criterion: At least 90% of students will receive a rating of “Satisfactory” or better from the course instructor.

Assessment: Every Year, starting in the 2013-2014 academic year.

**Learning Outcome 5** Students will demonstrate the ability to conduct complex data analysis tasks to inform managerial decisions.

Measure: Students will be required to pass a core set of business analytics classes.

Criterion: At least 90% of students will receive a rating of “Satisfactory” or better based on a review of their performance in the core classes. The Academic Director will advise students rated below “Satisfactory” to help improve their performance or determine their continued participation in the program..

Assessment: Every Year, starting in the 2013-2014 academic year.

#### **IV. FACULTY AND ORGANIZATION**

**A. Who will provide academic direction and oversight for the program? [This might be a department, a departmental subgroup, a list of faculty members, or some other defined group.]**

Primary oversight of this program will be provided by a faculty member assigned as the director of the program. A committee of faculty members has been created to address issues including admissions, academic policies, student activities, and internship / placement opportunities. The program would also be overseen by the chair of the Decision, Operations, and Information Technology (DO&IT) department and the Dean’s office.

The department of Decision, Operations, and Information Technologies at the Robert H Smith School of Business currently has 35 FTE faculty. Twenty-five of these are tenure/ tenure track. All faculty have doctoral degrees in information systems, computer science, statistics, or related areas.

#### **Faculty Expected to Teach in the Proposed MSIS Program**

Zhi-Long Chen, PhD, Professor of Operations Management, Department Chair  
Teaching/research focus: optimization, logistics, scheduling, supply chain management, and operations management

Course: To be determined

Sean Barnes, PhD, Assistant Professor of Operations Management  
Teaching/research focus: modeling, simulation, and complex systems

Courses: BUDT 758 Computer Simulation and BUDT 758 Data Processing in Python

Margret Bjarnadottir, PhD, Assistant Professor of Management Science and Statistics

Teaching/research focus: operations research methods using large scale data

Course: BUDT 758 Data Mining and Predictive Analytics

Barney Corwin, PhD, Tyser Teaching Fellow of Information Systems

Teaching/research focus: the application of project management methods, mindset, and techniques to business and organizational opportunities and problems and the innovative use of information systems in businesses and organizations

Course: BUDT 758 IS Projects and BUSU 785 Project Management

Anandasivam Gopal, PhD, Associate Professor of Information Systems

Teaching/research focus: empirical software engineering and software engineering economics

Course: BUSI 621 Strategic and Transformational IT

Hassan Ibrahim, D.Sc., Tyser Teaching Fellow of Information Systems

Teaching/research focus: management of technology; especially the strategic applications of information systems to supply chain management

Courses: BUDT 703 Business Process Analysis and BUDT 740 IS Projects

Kislaya Prasad, PhD, Director, Center for International Business Education and Research and Research Professor

Teaching/research focus: computability and complexity of individual decisions and economic equilibrium, innovation and diffusion of technology, and social influences on economic behavior

Courses: BUDT 758 Data Models and BUDT 758 Data Mining and Predictive Analytics

Raghu Raghavan, PhD, Professor of Management Science & Operations Management

Teaching/research focus: quantitative methods (in particular optimization models) for better decision making

Courses: BUDT 758 Data Models and BUDT 758 Decision Analytics

Louiqa Raschid, PhD, Professor of Information Systems

Teaching/research focus: solving the challenges of data management, data integration, and performance for applications in the life sciences, Web data delivery, health information, financial information systems, humanitarian IT applications and Grid computing

Course: BUDT 704 Database Management

Donald Riley, PhD, Professor of Information Systems

Teaching/research focus: applications of interactive computer graphics and multimedia to computer-aided design and computer-aided manufacturing (CAD/CAM), knowledge-based systems for design and manufacturing, computer-aided mechanism analysis and design, application of CAD/CAM techniques to biomechanical and bioengineering problems, and the product development process

Courses: BUDT 705 Data Networks & Infrastructures and BUDT 758 IS Security



Katherine Stewart, PhD, Associate Professor of Information Systems  
Teaching/research focus: technology-mediated work and collaboration  
Course: BUDT 703 Business Process Analysis

Tunay Tunca, PhD, Associate Professor of Management Science and Operations Management  
Teaching/research focus: economics of operations and technology management, theoretical and empirical analysis of procurement contracts and processes, economics of security, and the role of information and forecasting in supply chains  
Course: BUDT 758 Data Models

Siva Viswanathan, PhD, Associate Professor of Information Systems and Co-director of Center for Electronic Markets and Enterprises  
Teaching/research focus: emerging issues related to online firms and markets, and on analyzing the competitive and strategic implications of new information and communication technologies  
Course: BUSI 622 Managing Digital Business Markets

**B. If the program is not to be housed and administered within a single academic unit, provide details of its administrative structure. This should include at least the following:**

Not applicable. All classes will be housed and administered within the Robert H Smith School of Business

## **V. OFF CAMPUS PROGRAMS**

**A. If the program is to be offered to students at an off-campus location, with instructors in classrooms and/or via distance education modalities, indicate how student access to the full range of services (including advising, financial aid, and career services) and facilities (including library and information facilities, and computer and laboratory facilities if needed) will be assured.**

In addition to holding classes on the UMCP campus, some sections of the program may meet at our DC location in the US Department of Commerce building, our Baltimore facility in the Baltimore BioPark, or our facility at the Universities of Shady Grove. Those facilities already contain adequate classrooms, computer facilities, study rooms, and administrative space for academic advising, career advising, and student activity support.

**B. If the program is to be offered mostly or completely via distance education, you must describe in detail how the concerns in Principles and Guidelines for Online Programs are to be addressed.**

Currently, the program is structured to be entirely delivered in a traditional classroom setting. Over time, we may evaluate online learning opportunities, but nothing is currently scheduled. Should we move towards some courses being offered online, all online courses would adhere to

the policies and concerns outlined in the University of Maryland document, Principles and Guidelines for Online Programs.

Program Development, Control and Implementation Would Be By Faculty - The faculty would have overall control over the design, development, and administration of any online academic instruction. Smith school technical support personnel would be available, as well as agreements with the off-campus sites for technical support during classroom hours. Support will be available to faculty during course development, as well as during the offering of the program.

## **VI. OTHER ISSUES**

### **A. Describe any cooperative arrangements with other institutions or organizations that will be important for the success of this program.**

Not applicable. All aspects of the program from admissions to academic programming to career advising will be provided by the Robert H Smith School of Business. While the program will reach out to local companies and institutions for guest speakers, internship opportunities, experiential learning projects, and job placement, no particular relationship is pivotal to the success of the program.

### **B. Will the program require or seek accreditation? Is it intended to provide certification or licensure for its graduates? Are there academic or administrative constraints as a consequence?**

The University of Maryland's Robert H. Smith School of Business is already accredited by the AACSB (American Association of Collegiate Schools of Business). No accreditation is sought for this individual program.

## **VII. COMMITMENT TO DIVERSITY**

### **Identify specific actions and strategies that will be utilized to recruit and retain a diverse student body.**

The Robert H. Smith School of Business community is multifaceted at every level – students, staff and faculty represent a diverse blend of backgrounds, nationalities, ethnicities and experiences. About a dozen Smith School and student clubs are focused on bringing members together who have similar interests in gender, nationality, religion, and sexual orientation.

To attract the most diverse population possible for the proposed Masters of Science in Information Systems program, Smith School recruiting staff will focus on domestic efforts. These efforts will be targeted at recruiting U.S. minorities and American women of all ethnicities.

Current efforts include:

- Representing Master programs in U.S. MBA and Master Fairs and Tours

- Representing Master programs in International MBA and Master Fairs and Tours
- Online Chats
- U.S. College Visits
- International College Visits
- GMASS-based Mailings
- GRE-based Mailings
- Direct Mail
- Email Campaigns
- Outreach to College and Campus Organizations and Clubs
- Participating in Career/Graduate Study Panels or Workshops
- Presentations at Professional Conferences
- Creation of "Leap Your Career Forward" for Current UMD Students Looking At MBA and Master Study Post-Undergraduate Studies (An Annual Event)
- Advertising in UMD Campus Newspapers
- Master Only Education Fairs (Fall And Spring) Throughout the U.S.
- Participation in a Masters-focused Business School Alliance
- Participant in Graduate Business Education Events Targeted for Underrepresented Populations, Particularly U.S. Minorities and Women

Future efforts include:

- Including Master's Level Programming in Marketing Content Targeted to U.S. Military/Veterans
- Outreach to College Organizations in the Washington, D.C. Area
- Enhancement of Website for All Master Programs
- Inclusion of Spotlight and Vignettes of Master Alumni and Current Students who Reflect Diversity
- Participation in Events Targeted for Women Seeking Graduate Study (General And Non-MBA Based Events)
- Social Media and Online Advertising within U.S. Markets
- Partnerships with Academic Testing Centers and Overseas Advisors For International Graduate Study
- Marketing Targeting Young UMD Alumni and Young University Of Maryland System Alumni

## **VIII. REQUIRED PHYSICAL RESOURCES**

The proposed Masters of Science in Information Systems (MSIS) program replaces the existing Master of Science in Business with a concentration in Information Systems (MSB/IS) degree currently offered. The proposed program can be implemented in accordance with Section 11

206.1 in which programs developed under this provision can be implemented within existing resources of the campus. In proceeding with the submission of this program, the institution's president certifies that no new general funds will be required for the implementation of this master's-level program.

**A. Additional library and other information resources required to support the proposed program. You must include a formal evaluation by Library staff.**

As this proposed program replaces a current program, no additional resources are required.

**B. Additional facilities, facility modifications, and equipment that will be required. This is to include faculty and staff office space, laboratories, special classrooms, computers, etc.**

As this proposed program replaces a current program, no additional facilities or facility modification is required. The School has adequate space in Van Munching Hall and in our satellite locations to house current faculty and students in the proposed program. No additional classrooms or computer laboratories are required.

**C. Impact, if any, on the use of existing facilities and equipment. Examples are laboratories, computer labs, specially equipped classrooms, and access to computer servers.**

See response to VIII.B above.

## **IX. RESOURCE NEEDS and SOURCES**

**Describe the resources that are required to offer this program, and the source of these resources. Project this for five years. In particular:**

**A. List new courses to be taught, and needed additional sections of existing courses. Describe the anticipated advising and administrative loads. Indicate the personnel resources (faculty, staff, and teaching assistants) that will be needed to cover all these responsibilities.**

As this proposed program replaces a current program, no additional courses or changes in advising or administrative workload is required.

**B. List new faculty, staff, and teaching assistants needed for the responsibilities in A, and indicate the source of the resources for hiring them.**

Faculty resources of the Robert H Smith School of Business and in particular the DO&IT department of the School (as described herein) are adequate to cover the size of the proposed MSIS program. Approval of this proposal would not alter the responsibilities of the faculty beyond those already generated by the MSB/IS program that this proposal seeks to replace.

**C. Some of these teaching, advising, and administrative duties may be covered by existing faculty and staff. Describe your expectations for this, and indicate how the current duties of these individuals will be covered, and the source of any needed resources.**

As described above, teaching, advising, and administrative duties will be handled by existing faculty members (who are already teaching and conducting research on related topics).

**D. Identify the source to pay the for the required physical resources identified in Section VIII. above.**

No additional resources are required.

**E. List any other required resources and the anticipated source for them.**

Not applicable.

**F. Provide the information requested in [Table 1](#) and [Table 2](#) (for Academic Affairs to include in the external proposal submitted to USM and MHEC).**

Given that this degree replaces a degree already offered, there are no incremental revenues or expenses.

**Appendix 1: Peer Comparisons –Information Systems Programs offered by MBA Ranked Peers**

<b>MBA Ranking BW / US News</b>	<b>University</b>	<b>Degree Name of Information Systems Program</b>
#11 / #19	Carnegie Mellon University	Master of Information Systems Management
#15 / #22	Indiana University	Master of Science in Information Systems
#16 / #10	New York University	Master of Science in Information Systems
#26 / #35	Texas A & M University	Master of Science in Management Information Systems
#37 / #23	University of Washington	Master of Science in Information Systems
#40 / #47	University of Illinois, Urbana- Champaign	Master of Science in Technology Management
#48 / #36	University of Florida	Master of Science with a major in Information Systems & Operations Management
#49 / #30	Arizona State University	Master of Science in Information Management
#50 / #37	University of Rochester	Master of Science in Information Systems Management
NC / #37	University of Texas, Dallas	Master of Science in Information Technology and Management
NR / #44	University of Arizona	Masters in Management Information Systems

## Appendix 2: Curriculum Comparisons

**Bold** = similar courses in our core. *Italics* = similar courses offered as electives.

University Degree MBA Ranking	Curriculum	Prerequisites	Comments
Carnegie Mellon University Master of Information Systems Management #11	<p><b>Core:</b>            Distributed Systems  <b>Database Management</b>  <b>Telecommunications Management</b>  <i>Object Oriented Programming in Java</i>  <b>Object Oriented Analysis and Design</b>  <b>Digital Transformation</b>            Organizational Design and Implementation            Economic Analysis            Financial Accounting            Principles of Finance  <b>Decision Making Under Uncertainty</b>  <b>Statistics for IT Managers</b>            Strategic Writing Skills            Professional Speaking</p>	<p>Object-oriented programming coursework            One-year track: At least three years of work experience</p>	<p>There is significant overlap in the core courses of this program and ours. Our program provides greater depth in analytics in core courses whereas the CMU program includes more general business courses in the core (i.e. Accounting and Finance).</p>
Indiana University Master of Science in Information Systems #15	<p><b>Required:</b>            IS Foundations Core            Practicum / Internship</p> <p><b>Electives:</b>  <b>Data Warehousing: Concepts &amp; Mgmt</b>  <b>IS Capstone Project</b>  <b>An Introduction to Data Mining</b>  <i>Advanced Topics in MSIS - Web Analytics</i>  <i>Organizational Info Systems Security</i>            Cybersecurity Law and Policy            Business Process Integration with ERP  <i>Supply Chain Management and Technologies</i>  <i>Strategic Sourcing</i>            Adv Web Applications Development: Service-Oriented Architecture  <i>Advanced Topics in MIS: Advanced IS Management</i>            Advanced Topics in MIS: Enterprise Business Application Software            Business Process Integration with ERP</p>	<p><b>Equivalent courses to:</b>            Introductory Programming            Database Management            Introduction to Financial Accounting Operations Management            Principles of Finance            Principles of Marketing            Principles of Management</p>	<p>Though many similar courses are offered, our program is more structured to provide a coherent core set of courses covering information technology and analytics topics.</p>

University Degree MBA Ranking	Curriculum	Prerequisites	Comments
	<p><b>Intro to Spreadsheet Modeling</b>            Business Process Design            Thinking Strategy: Game Theory/Business Strategy            Developing Strategic Capabilities            Power, Persuasion, Influence &amp; Negotiation            Management Consulting            Managing a Client Engagement</p>		
New York University Master of Science in Information Systems #16	<p>Managing Organizations  <b>Understanding Firms and Markets</b>  <b>Statistics &amp; Data Analysis</b>            Financial Accounting and Reporting            Global Business Environment: Trade and Investment            The Global Business Environment: International Macroeconomics and Finance            Marketing Concepts and Strategies            Foundations of Finance            Operations  <b>Managing the Digital Firm</b>            Designing &amp; Developing Web-based Systems  <b>Data Mining and Knowledge Systems</b>            Electronic Commerce            Financial Information Systems            Current Topics (Advanced Technology)            Fundamental Algorithms  <b>Data Communications and Networks</b>            Operating Systems  <b>Database Systems</b>  <b>The Information Technology Projects Course</b></p>	<p>At least 1.5 years of full-time work experience, indicating some business leadership ability            Programming ability with comprehension of data structures and simple CS algorithms and evidence of ability to excel in graduate courses in computer science            All Bs or better, with many As, in business, engineering and science courses; lower grades may be acceptable from very prestigious schools</p>	<p>There is significant overlap in the courses of this program and ours. Our program provides greater depth in analytics whereas the NYU program includes more general business courses (i.e. Marketing and Finance).</p>
Texas A & M University Master of Science in Management Information Systems #26	<p><b>Required Courses:</b>            Accounting Controls and Procedures            Introduction to Contemporary Manufacturing  <b>MIS Project Management and Implementation</b>  <b>Information Systems Design and Development</b>  <b>Advanced Systems Analysis and Design</b></p>	<p>A course in statistics            A course in programming (Java, C++, VB, etc.)            A database course            A course in systems analysis</p>	<p>This program is similar to ours in the technology courses, but does not include as much depth in Analytics.</p>



University Degree MBA Ranking	Curriculum	Prerequisites	Comments
	Data Warehousing Corporate Information Planning Information Systems Sourcing <b>Advanced Database Management</b> <i>Business Information Security</i> <b>Elective Courses:</b> Customer Relationship Management Technologies Business Process Design E-Services <b>Data Mining</b> Logistics and Distribution Management Professional Internship	and design A course in business data communications	
University of Washington Master of Science in Information Systems #37	<b>Required courses:</b> <b>Information Technology and Organizational Strategy</b> <b>Business Data Analysis</b> <b>Operations and Business Process Management</b> <b>Business Decision Models</b> <b>Introduction to Data Mining and Analytics</b> <b>Digital Transformation of Organizations</b> <i>Information Security in a Networked World</i> <b>Information Technology and Marketing in the New Economy</b> <b>Advanced Business Data Mining</b> Compliance and Legal Issues in Information Technology <b>Managing Information Technology Projects</b> Enterprise Systems and Integration  <b>Elective courses:</b> <i>Advanced and Unstructured Data Mining</i> Advanced Development Frameworks <b>Advanced Database Systems and Data Warehouses</b> Managing Information Technology Resources Technology Entrepreneurship Information Systems Economies Contemporary Topics in Information	-	Structure of the UW program is similar to ours.

University Degree MBA Ranking	Curriculum	Prerequisites	Comments
	Systems		
Arizona State University Master of Science in Information Evening Program #49	<b>All required:</b> <b>Data &amp; Information Management</b> <b>Strategic Value of Information Technology</b> <b>Business Intelligence</b> <i>Information Security and Controls</i> <b>Business Process and Workflow Analysis</b> Emerging Technologies Managing Enterprise Systems <b>IT Services and Project Management</b> Knowledge Management and Text Analysis <b>Applied Project</b>	2-year related work experience Undergraduate degree in a related field Courses or equivalent experience in statistics, brief calculus and a programming language	Our program has a more defined focus on Analytics.
University of Rochester Master of Science in Information Systems Management #50	<b>Required:</b> Information Systems for Management The Economics of Information Management <b>Business Process Analysis and Design</b> <b>Framing and Analyzing Business Problems I and II</b> Communicating Business Decisions Operations Management Managerial Economics  <b>Electives:</b> Corporate Financial Accounting <b>Electronic Commerce Strategy</b> Financial Information Systems Capital Budgeting and Corporate Objectives <i>Supply Chain Management</i> Service Management International Manufacturing and Service Strategy The Economic Theory of Organizations	No specific prerequisites	This program is somewhat similar to ours but with a greater focus on general business courses (e.g. in finance, operations management)
University of Arizona Masters in Management Information Systems	<i>Healthcare Information Systems</i> Software Design and Integration Business Communications <b>Web Computing and Mining</b> Social and Ethical Issues of the Internet <b>Business Foundations for IT</b> <i>Information Security in Public and Private Sectors</i>	Experience in computer and Web programming Knowledge and experience with (1) Java and (2) JSP and Servlets, PHP or .NET/J2EE	Program is similar to ours.

University Degree MBA Ranking	Curriculum	Prerequisites	Comments
	Information Security Risk Management Systems Security Management Introduction to Enterprise Computing Environments Detection of Deception and Intent <b>Enterprise Data Management</b> <b>Analysis and Design of Service-Oriented Systems</b> <b>Business Data Communications &amp; Networking</b> <b>Data Mining for Business Intelligence</b> <i>Operations Management</i> Managing for Quality Improvement Production and Operations Management The Supply Chain and Logistics <b>Project Management</b> Financial Information Systems <b>Strategic Management of Information Systems</b> <b>Business Intelligence</b> Special Topics in MIS - Mobile Device Programming	Knowledge of database connectivity via ODBC or JDBC is recommended	