RICE UNIVERSITY

PROFESSIONAL SCIENCE MASTER'S

WIESS SCHOOL OF NATURAL SCIENCES

GRADUATE DEGREE REQUIREMENTS AND PROCEDURES

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www.profms.rice.edu

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Consult the Rice University General Announcements
on-line at http://ga.rice.edu/
for additional information or changes.

PROGRAM OVERVIEW

The Wiess School of Natural Sciences offers four degrees through the Professional Science Master's Program.

The **Master of Science in Bioscience and Health Policy** provides skills needed for work in bio-scientific, health-related industries and governmental organizations. It aims to build leaders in science and health policy who will create, promote, and integrate science, medicine. and practice.

The **Master of Science in Environmental Analysis** focuses on the methods needed by industrial and governmental organizations to deal with environmental issues.

The **Master of Science in Subsurface Geoscience** is geared for students who would like to become proficient in applying geological knowledge, geophysical methods and/or data management to finding, managing and developing reserves of oil and natural gas.

The **Master of Science in Space Studies** combines study of space engineering, aerospace, and life sciences, with courses in management, business and communication. It will train scientists/engineers to face challenges in human/robotic space exploration and space policy.

The curriculum for all professional science master's degrees consists of required science courses, electives, cohort courses, and a three to six month internship. This combination should enable the student to apply her/his scientific education in an industry environment.

GENERAL DEGREE REQUIREMENTS

Each degree consists of science core courses, cohort courses, elective courses, and a three to six month internship. Students must complete two reports on the internship experience and give a presentation during the Professional Master's Seminar.

Professional Science Master's students must take approximately 39 semester hours of upper level courses (30 credit hours have to be at the 500-level or higher); the total hours depends upon the chosen degree and courses selected. At least 24 semester hours must be completed at Rice. Students who have already taken courses substantially similar to any of the required courses (and have not used them for another degree) may request to transfer up to 9 credit hours from a former institution. This process requires that students submit a memo and copies of all relevant transcripts and course syllabi to the program committee. Each case must be individually approved by the program committee.

Students must maintain a B- (2.67) grade point average in courses counted toward the graduate degree. Students whose GPA falls below 2.67 are placed on probationary status. Students on probationary status will not be approved for an intern position or graduation.

The general timeline for these degrees is three semesters of study to complete the required coursework, plus a 3 to 8 month internship/work experience. Full-time students should be able to finish the degree in two years, part-time students usually finish within 3 to 4 years. The university allows a maximum of 5 years to complete a master's degree.

Students develop a study plan before entering the program that details the course work they are planning to pursue during their studies at Rice. The study plan is reviewed with advising faculty and adjusted over time to adapt to any changes in course offerings and career goals of student.

Professional Science Master's 5th Year Degree Option for Rice Undergraduates:

Rice students have an option to pursue a Professional Science Master's degree back-to back with the Bachelor's degree by adding just one more year of graduate studies to the four undergraduate years of science studies. Advanced Rice students in good standing apply during their junior year and then start taking required core courses of the respective program during their senior year in addition to finalizing their undergraduate requirements. Note that a specific course completed can be counted toward only *one* degree. Once all requirements for the undergraduate degree are completed, the student will matriculate into the master's degree program. A plan of study based on their specific focus area will need to be approved by the track director and the PSM director. Students should be aware that there could be financial aid implications if the conversion of undergraduate coursework to that of graduate level reduces their earned undergraduate credit for any semester below that of full-time (12 hours) status.

The Coordinated PSM/MBA Program Option:

In order to offer a deeper immersion into management and business acumen, the Professional Science Master's Program at Rice has collaborated with the Rice Jones Graduate School of Business to offer an integrated PSM/MBA study option. Applications to both programs have to be received at the same time. According to the Professional Science Master's track focus, graduates are qualified for leadership roles in industries related to the environment, nanotechnology, energy and government.

This coordinated degree program can be completed in 2 1/2 to 3 years. This dual degree includes a total of 45 hours of course work in business management and 30 credit hours in the chosen PSM track. Students will complete the same core requirements as the students in the regular MBA and PSM programs. Successful graduates from both degree programs will receive a Master of Science and a MBA degree.

Admission Requirements

To enter this coordinated degree program, applicants must apply and be accepted by both the Jones School of Business (JGSB) and one of the following Weiss School of Natural Sciences Professional Science Master's (PSM) programs: Bioscience and Health Policy, Environmental Analysis and Decision Making, Subsurface Geoscience, or Space Studies. The program requires the JGSB application, two letters of recommendation, and the GRE.

Degree Requirements

Students may earn a Master of Science degree from the Wiess School of Natural Sciences' Professional Science Master's program in the following fields: (1) Bioscience and Health Policy, (2) Environmental Analysis and Decision Making, (3) Subsurface Geoscience, and (4) Space Studies. Ordinarily, both the PSM and the MBA each take two academic years to complete. Coordinated degree candidates are required to fulfill a minimum of 5 full time, consecutive semesters (2.5 academic years). In rare cases, a sixth semester may be necessary; however, the standard progression is as follows and students must maintain the academic pace set out by their coordinated degree plan:

- PSM: a minimum of two consecutive full time semesters
- MBA: a minimum of three consecutive full time semesters

For the coordinated MBA/Master of Science degree from the Professional Master's program, students must fulfill the following minimum requirements:

- 75 credit hours of course work including at least 30 credits in a science discipline and 45 credits of business course work
- Satisfy all MBA core curriculum requirements
- Satisfy all Professional Masters MS track-specific requirements

- Meet with the Coordinated-Degree Advisory Team each semester for academic advising and progress review
- Summer internships are required
- All requirements must be fulfilled within a maximum of three full time academic years

At the MBA and PSM discretion, a standard maximum of 6 credit hours of pre-degree-entry coursework may be transferred into the coordinated-degree. Students are not permitted, however, to take any MBA core courses prior to their official entry into the program.

Special circumstances (*e.g.,* medical condition, familial obligation, *et al*.) can arise during a student's academic career, which may require a temporary halt to academic pursuits (leave of absence or temporary withdrawal). In such cases, students are required to submit a written appeal with supporting documentation (if applicable) requesting a leave of absence or temporary withdrawal. If jointly approved, a revised degree plan will be developed upon the student's return to the program. In the case of an approved academic leave of absence or temporary withdrawal, reenrollment must occur within three academic years from departure, and students are still expected to graduate with the coordinated degree within a maximum of five to six full time semesters.

Program Cost Structure

The following is the standard tuition structure:

- MBA: a minimum of three consecutive (Fall, Spring, Fall) semesters.
- PSM: a minimum of two consecutive (Fall, Spring) semesters.

In rare cases a student may extend the program an additional sixth semester. The cost will be treated as follows:

- If a student enrolls in only PSM courses, then that semester's tuition will be the PSM rate.
- If a student enrolls in MBA or a combination of MBA/PSM courses, then that semester's tuition will be the MBA rate.

Scholarship funding may be awarded to a coordinated-degree student by one or both of the programs. In the case of MBA scholarships, funding eligibility is merit-based and determined at the point of admission into the program. In the case of PSM scholarships, funding may be awarded at the point of admission into the program or to current students. This funding is merit-based and determined through a holistic review of the quality of the application or the academic excellence of the current student. A scholarship given by a program is only available to the student during those semesters that the student is billed for that program's tuition (Example: An MBA scholarship is only available during the semesters MBA tuition is billed).

Due to changes in tuition and fees from one academic year to the next, students returning from a leave of absence or temporary withdrawal will be billed at the current class rate for MBA and/or at the current academic year rate for PSM.

BIOSCIENCE AND HEALTH POLICY DEGREE

Graduate students in the Bioscience and Health Policy program will take the following courses:

Four Required Bioscience Classes: The Bioscience courses give in-depth instruction in specialized areas of Bioscience. Four courses are required to obtain a broad understanding of diverse areas of cutting edge Bioscience research.

Select 12 credit hours from below as available: (Please note that not all classes are offered every year and courses maybe cancelled or added)
Check availability on the Registrar's Office Course Schedule site

BIOC 524 Microbiology and Biotechnology
BIOC 525 Plant Molecular Genetics and Development
BIOC 540 Metabolic Engineering
BIOC 544 Advanced Concepts and Critical Analysis in Modern Developmental Biology
BIOC 545 Advanced Molecular Biology and Genetics
BIOC 547 Experimental Biology and the Future of Medicine
BIOC 550 Viruses and Infectious Diseases
BIOC 555 Computational Synthetic Biology
BIOC 560 Cancer Biology
BIOC 570 Computation with Biological Data
BIOC 573 Immunology
BIOC 580 Protein Engineering
BIOC 585 Fundamentals of Cellular and Molecular Neuroscience
EBIO 523 Conservation Biology
EBIO 524 Conservation Biology Lab
EBIO 525 Ecology
EBIO 540 Global Biogeochemical Cycles
…and others

Note: *Other courses can be chosen with approval of advising faculty*

Required Cohort Courses (9 credit hours):

NSCI 501	Professional Master's Seminar [required for two semesters]
NSCI 511	Science Policy and Ethics
NSCI 512	Internship Project
NSCI 610	Management in Science and Engineering

Four Statistics, Economics, and Policy Courses:
The analytical competency requirement provides career-enhancing, marketable skills in policy analysis, economics and statistics. Students will take courses from groups A, B and C as indicated below:

A – Select one course related to Statistics / Data Analytics (a minimum of 3 credit hours)

BIOE 552	Intro Computational Systems Biology
ESCI 654	Geographic Information Science
ESCI 571	Date Science Methods and Data Management
STAT 553	Biostatistics
STAT 605	R for Data Science
STAT 684	Environmental Risk Assessment and Human Health

B – Select One Economics/Finance Course (a minimum of 3 credit hours)

MGMT 631	Health Insurance in the US: The Essentials
MGMT 678	U.S. Healthcare Management
MGMT 793	Creating the Data Driven Business
MGMT 750	Strategic Considerations in Health Informatics
PH 3910*	Introduction of Health Economics

C – Select Two Policy Courses (a minimum of 6 credit hours)

ANTH 581	Medical Anthropology
ANTH 643	Anthropology of Race, Ethnicity, and Health
HEAL 580	Disparities in Health in America
MGMT 631	Health Insurance in the US: The Essentials
MGMT 690	Healthcare Strategy
MGMT 691	Breakthrough Negotiations in a Health Care Context
NSCI 530	**The Shaping of Health Policy** *(course created for BHP students)*
SOCI 525	Population Health Seminar

A 3 - 6 months internship: Practical experience is offered via a 3 - 6 month work immersion. The internship will be under the guidance of a host company, government agency, or non-profit organization. A summary of the internship project is required in both oral and written form as part of the Professional Master's Seminar.

Minimum of Two Elective Courses

The electives reflect individual academic interests and career goals. Any course from the above list of courses can be taken as an elective, provided it was not taken as a required course. In addition, the following classes qualify as elective classes:

Select a minimum of 6 credit hours from the following or others as available:

ENGI 515	Leading Teams and Innovation
ENGI 529	Ethics and Engineering Leadership
ENGI 614	Learning How to Innovate
ENGI 615	Leadership Coaching for Engineers
HEAL 507	Epidemiology

HEAL 560	Planning and Evaluation of Health Promotion and Education
HURC 506	Health and Humanities Master Class
MGMT 623	Commercialization in Pharma/Biotech
MGMT 633	Life Science Entrepreneurship & Roles of Founders & Venture Capital in High-Tech Startups
MGMT 712	Process Management and Quality Improvement
MGMT 721	Business Law
MGMT 744	Services Operations
MGMT 778	Customer Experience Management
MGMT 793	Creating the Data Driven Business
MGMT 799	Healthcare Innovation and Entrepreneurship
PHIL 536	Topics in Medical Ethics

TOTAL REQUIRED CREDIT HOURS: 39

Note: *An individual course may not be not offered every year, and some courses may have pre-requisites or require instructor permission.*

**Students can also choose electives from courses offered at UT Graduate School of Biomedical Sciences (GS), Health Science Center (PH), and UT School of Biomedical Informatics (HI) as listed above.*

Please note:

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ENVIRONMENTAL ANALYSIS DEGREE

Graduate students in the Environmental Analysis program will take the following courses:

Please note that not all classes are offered every year and courses maybe cancelled or added Check availability on the Registrar's Office Course Schedule site - substitutions can be approved by the faculty advisor.

Required Science Core Courses

CEVE 501 Chemistry for Environmental Engineering and Science
OR CEVE 510 Principles of Environmental Engineering
EBIO 570 Ecosystem Management and Conservation
STAT 685 Environmental Statistics and Decision Making

Required Cohort Courses (9 credit hours):

NSCI 501 Professional Master's Seminar (required for two semesters)
NSCI 511 Science Policy and Ethics
NSCI 512 Internship Project
NSCI 610 Management in Science and Engineering

Elective Courses

Students will choose 21 credit hours elective of courses from the following three focus areas and satisfying the following requirements:
one course (3 credits) from each of EBIO, CEVE and STAT,
one course (3 credits) from the Management and Policy focus area,
and three courses (9 credits) from one focus area.

Environmental Sustainability

CEVE 501 Chemistry for Environmental Engineering and Science
CEVE 502 Sustainable Design
CEVE 507 Energy and the Environment
CEVE 508 Introduction to Air Pollution Control
CEVE 509 Hydrology and Watershed Engineering
CEVE 511 Atmospheric Processes
CEVE 512 Advance Hydrology and Hydraulics
CEVE 520 Environmental Remediation Restoration
CEVE 534 Fate and Transport of Contaminants in the Environment
CEVE 536 Environmental Biotechnology and Bioremediation
CEVE 550 Environmental Organic Chemistry
EBIO 523 Conservation Biology

EBIO 524 Conservation Biology Lab
EBIO 525 Ecology
EBIO 529 Animal Biology and Physiology
EBIO 540 Global Biochemical Cycles
EBIO 560 Environmental Impact Statements and Permitting *(course created for EA)*
EBIO 563 Topics in Ecology
EBIO 566 Applied Psychology
EBIO 568 Topics in Biological Diversity
EBIO 569 Core course in Ecology and Evolutionary Biology
EBIO 572 Coral Reef Ecosystems
EBIO 580 Sustainability Development and Reporting *(course created for EA)*
ESCI 618 Quantitative Hydrogeology
ESCI 650 Remote Sensing
ESCI 654 Geographic Information Science
STAT 684 Environmental Risk Assessment and Human Health

Management and Policy
CEVE 528 Engineering Economics
CEVE 529 Ethics and Engineering Leadership
ESCI 617 Petroleum Industry Economics and Management
GLBL 543 Energy Policy
MGMT 609 Managing Energy Transitions
MGMT 610 Fundamentals of the Energy Industry
MGMT 661 International Business Law
MGMT 670 Operations Strategy
MGMT 676 Social Enterprise
MGMT 721 Business Law

Quantitative Decision-Making
CEVE 528 Engineering Economics
ESCI 650 Remote Sensing
ESCI 654 Geographic Information Science
STAT 553 Biostatistics
STAT 605 R for Data Science
OR STAT 606 SAS Statistical Programming
STAT 615 Regression and Linear Models
STAT 684 Environmental Risk Assessment and Human Health

Internship:

A three to six month internship under the guidance of a host company, government agency or national laboratory is required. At the conclusion of this internship, students must present their internship project in both oral and written form as part of the Professional Master's Project.

TOTAL REQUIRED CREDIT HOURS: 39

NOTE: *Some listed courses may not be offered every year, and others may be offered that satisfy the requirements with pre-approval. Students should consult with their academic advisors before enrolling*.

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SUBSURFACE GEOSCIENCE DEGREE

There are three focus areas in the Subsurface Geoscience track: **Geology, Geophysics and Energy Data Management**

Please note that not all classes are offered every year and courses maybe cancelled or added. Check availability on the Registrar's Office Course Schedule site

Core Requirements for all 3 Specializations (12-13 credit hours):

ESCI 549 Data Management and Data Governance
ESCI 558 3D Seismic Reflection Interpretation*
ESCI 615 Decision Making and Economics in the Energy Industry
OR ESCI 545 Hydrocarbon Systems Analysis
ESCI 636 Well Logging and Petrophysics

***Prerequisite or co-requisite: ESCI 442/642 Exploration Geophysics**

Required Cohort Courses (9 credits):

NSCI 501 Professional Master's Seminar (required for two semesters)
NSCI 511 Science Policy and Ethics
NSCI 512 Internship Project
NSCI 610 Management in Science and Engineering

GEOLOGY FOCUS AREA:

Required Courses (6 credit hours)

ESCI 626 Introduction to Seismic Interpretation
OR ESCI 663 Structure and Evolution of Tectonic Systems
ESCI 627 Sequence Stratigraphy
OR ESCI 504 Siliciclastic Depositional Systems
OR ESCI 516 Topics on Carbonates

Students will choose 12 credit hours from the following electives:

ESCI 504 Siliciclastic Depositional Systems
ESCI 506 Carbonate Depositional Systems
ESCI 507 Applied Sedimentology II
ESCI 516 Topics on Carbonates
ESCI 527 Seminar: Quantitative Petroleum Systems Analysis
ESCI 544 Hydrocarbon Exploration (AAPG Imperial Barrel competition)
ESCI 545 Hydrocarbon Systems Analysis
ESCI 564 Seismic Reflection Data Processing
ESCI 626 Interpretation of Regional 2-D Seismic Data
ESCI 627 Sequence Stratigraphy
ESCI 642 Exploration Geophysics
ESCI 652 GIS for Scientists and Engineers
ESCI 663 Structure and Evolution of Tectonic Systems

MGMT 609 Managing Energy Transitions
MGMT 610 Fundamentals of the Energy Industry

NOTE: *Some listed courses may not be offered every year, and others may be offered that satisfy the requirements with pre-approval. Students should consult with their academic advisors before enrolling.*

GEOPHYSICS FOCUS AREA:

Required Courses (9 credit hours)
ESCI 640 Geophysical Data Analysis: Digital Signal Processing
ESCI 641 Geophysical Data Analysis: Inverse Methods

Students will choose 12 credit hours from the following electives:
ESCI 504 Siliciclastic Depositional Systems
ESCI 506 Carbonate Depositional Systems
ESCI 544 Hydrocarbon Exploration
ESCI 545 Hydrocarbon Systems Analysis
ESCI 564 Seismic Reflection Data Process
ESCI 627 Sequence Stratigraphy
ESCI 640 Geophysical Data Analysis: Digital Signal Processing
OR ESCI 641 Geophysical Data Analysis: Inverse Methods
ESCI 642 Exploration Geophysics
ESCI 652 GIS for Scientists and Engineers
ESCI 663 Structure and Evolution of Tectonic Systems
MGMT 609 Managing Energy Transitions
MGMT 610 Fundamentals of the Energy Industry

NOTE: *Some listed courses may not be offered every year, and others may be offered that satisfy the requirements with pre-approval. Students should consult with their academic advisors before enrolling.*

ENERGY DATA MANAGMENT FOCUS AREA:

Required Courses (9 credit hours)
ESCI 530 Data Science Environmental and Geosciences
ESCI 570 Computational and Data Science in the Energy Industry
ESCI 571 Data Science Methods and Data Management

Students will choose 9 credit hours from the following electives:
CEVE 528 Engineering Economics
COMP 543 Graduate Tools and Models- Data Science
COMP 556 Introduction to Computer Networks
ECON 601 Energy Economics
ESCI 652 GIS for Scientists and Engineers
GLBL 543 Energy Policy
MGMT 609 Managing Energy Transitions
MGMT 610 Fundamentals of the Energy Industry

MGMT 611 Geopolitics of Energy
MGMT 661 International Business Law
MGMT 670 Operations Strategy
MGMT 676 Social Enterprise
STAT 518 Probability

NOTE: *Some listed courses may not be offered every year, and others may be offered that satisfy the requirements with pre-approval. Students should consult with their academic advisors before enrolling.*

Internship:

A three to six month internship under the guidance of a host company, government agency or national laboratory is required. At the conclusion of this internship, students must present their internship project in both oral and written form as part of the Professional Master's Project.

TOTAL REQUIRED CREDIT HOURS: 40

NOTE: *Some listed courses may not be offered every year, and others may be offered that satisfy the requirements with pre-approval. Students should consult with their academic advisors before enrolling*.

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SPACE STUDIES DEGREE

Graduate students in the Space Studies program will take the following courses:

Please note that not all classes are offered every year and courses maybe cancelled or added. Check availability on the Registrar's Office Course Schedule site

Required Core Science/Engineering Courses (9 credit hours)

ASTR 570	Solar System Physics
MECH 572	Aerospace Systems Engineering
STAT 605	R for Data Science

Choose two courses (6 credit hours) from the list below:

ASTR 554	Astrophysics of the Sun
BIOC 540	Metabolic Engineering
ESCI 540	Earth's Atmosphere
ESCI 660	Geological and Geophysical Fluid Dynamics
MECH 554	Computational Fluid Mechanics
MECH 592	Aerospace Environments

Required Cohort Courses: (9 credit hours)

NSCI 501	Professional Science Master's Seminar
NSCI 502	Space Studies Seminar Course (S)
NSCI 511	Science Policy & Ethics (S)
NSCI 512	Professional Master's Project – after internship
NSCI 610	Management in Science and Engineering

Two Statistics/Computation Courses (6 credit hours): The analytical competency requirement provides career-enhancing, marketable skills in in finance, economics and computation. Students can choose courses as follows.

CAAM 550	Numerical Analysis I
CEVE 528	Engineering Economics
ESCI 650	Remote Sensing
MECH 554	Computational Fluid Mechanics
PHYS 517	Computational Physics
STAT 502	Neural Machine Learning I
STAT 541	Multivariate Analysis
STAT 615	Probability and Statistics / Statistical Computing and Graphics

Three Electives (9 credit hours): Select a minimum of 9 credit hours from one of the following areas, depending on the student's individual interests and career goals.

Focus: Engineering

CEVE 504	Atmospheric Particular Matter
CEVE 511	Atmospheric Processes
CEVE 576	Structural Dynamic Systems
COMP 598	Intro to Robotics
ENGI 515	Leading Teams in Innovation
ENGI 614	Learning how to Innovate
MECH 554	Computational Fluid Mechanics
MECH 574	Turbulence
MECH 578	Orbital Mechanics and Mission Design
MECH 579	Launch Vehicle and Spacecraft Design
MECH 591	Gas Dynamics
MECH 592	Design for Aerospace Environments
MECH 594	Intro to Aeronautics
MECH 596	Flight Mechanics
MECH 691	Introduction to Hypersonic Aerodynamics

Focus: Sciences (Astro Science/Earth Science/Life Sciences)

ASTR 542	Nebular Astrophysics
ASTR 554	Astrophysics of the Sun
ASTR 555	Protostars and Planets
ASTR 565	Compact Objects
BIOC 524	Microbiology and Biotechnology
BIOC 540	Metabolic Engineering
BIOC 544	Developmental Neurobiology
BIOC 545	Advanced Molecular Biology
BIOC 570	Computation with Biological Data
BIOC 580	Protein Engineering
ESCI 540	Earth's Atmosphere
ESCI 581	Topics in Planetary Dynamics and Magmatic Processes
ESCI 667	Geomechanics
ESCI 672	Earth Systems Modeling: Numerical Techniques and Applications
ENGI 515	Leading Teams in Innovation
ENGI 614	Learning how to Innovate
MGMT 633	Roles of Physicians, Scientists, Engineers and MBA's in High Tech Startups

Focus: Management and Entrepreneurship

ENGI 515	Leading Teams in Innovation
ENGI 614	Learning how to Innovate
MGMT 601	Financial Statement Analysis
MGMT 618	Bestsellers: The Science and Wisdom
MGMT 629	Business Plan Development
MGMT 633	Roles of Physicians, Scientists, Engineers and MBA's in High Tech Startups
MGMT 658	Applied Risk Management
MGMT 734	Technology Entrepreneurship

NOTE: *Some listed courses may not be offered every year, and others may be offered that satisfy the requirements with pre-approval. Students should consult with their academic advisors before enrolling.*

Internship:

A three to six month internship under the guidance of a host company, government agency or national laboratory is required. At the conclusion of this internship, students must present their internship project in both oral and written form as part of the Professional Master's Project.

TOTAL REQUIRED CREDIT HOURS: 39

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COHORT COURSES

Students enrolled in all four degree programs are required to participate in a set of cohort courses that focus on building communication and business skills.

A. Management for Science and Engineering (NSCI 610) — This course is designed for science and engineering students who want to understand the management of new and/or small technology-based businesses. The course is taught in modular format to give students insight into how technology-oriented firms manage intellectual property, marketing, organization behavior, strategy, accounting, and finance.

B. Science Policy and Ethics (NSCI 511) — An introduction to the policy, ethics, politics, and legal issues that relate to science and technology discovery and application. This course presents a framework for analyzing ethical issues in business and professional work. The course will explore ways in which government policy and business practices can promote or inhibit advances in science and technology while influencing the ethical choices of the professionals involved. The class will also focus on developing critical thinking and writing skills.

C. Professional Master's Seminar (NSCI 501) — Students must register for the Professional Master's Seminar during two semesters of study. This weekly seminar serves to provide exposure to local industry leaders from all programs, introduce career management and business relations tools, further develop written and oral communication skills, and provide a forum for students to present internship project results.

Communication abilities will be assessed during the Professional Master's Seminar beginning with an assessment workshop before start of semester. Each student will receive individual recommendations on how to improve over the course of the degree program. Internship presentation and reports will also be graded and assessed by the PSM Communication faculty.

The seminar course is given on a pass/fail basis only. Attendance at seminars is mandatory unless the course administrator has excused the absence in advance. Students are allowed two excused absences per semester.

D. Professional Master's Project (NSCI 512) — Students must register for this course during their final semester. Students will receive a letter grade in this course based upon the quality of their internship/project presentation and associated reports. Presentations will be made as part of the Professional Master's Seminar.

PROFESSIONAL DEVELOPMENT PROGRAM

Mentoring built into the PSM curriculum engages students, alumni, and affiliated community members in four strategic ways:

1. Mentoring Program:
The main purpose is to connect students with alumni and foster relationships that benefit both the alumni mentor and especially the student. This relationship gives the student an outlet to ask academic, professional and industry-specific questions and allows the alumni mentors an opportunity to educate the next generation of leaders in the field.

2. Guest Lectures/ Panel Discussions:
The monthly seminars host a guest lecture that provides insights into industry-specific topics or related career paths for PSM students. These lectures are structured so that the students have ample time to engage the speaker in a lively discussion following their brief talk.

3. Professional Development and Career Workshops:
The PSM program works in close collaboration with the Rice Center for Career Development, encouraging students to attend workshops that help prepare students for the professional world at large. These workshops include resume and portfolio review, interview techniques, mock interviews, networking practice, *et al*. The workshops take place throughout the semester, preparing students for internships or full-time employment for the coming summer.

5. Required Internships or Work Experience:
All PSM students are required to complete a corporate or academic internship as part of the degree program. Corporate internship providers assign a mentor to their respective student intern, and this mentor is expected to provide guidance throughout the internship experience.

6. PSM Industry Board of Affiliates:

Board members are available to provide guidance, mentorship and advice to PSM students throughout their time at Rice.

Expectations of PSM Mentoring Program:

The PSM Office assigns an alumni and a student mentor to each incoming student during the summer before arriving at Rice. The incoming students have the responsibility to initiate contact and start a conversion with their mentors and meet them in person. The PSM Office hosts a student/alumni social at the beginning of the first semester so students can meet their mentors in person.

STUDENT ADVISING

Two weeks prior to the first semester of study, students will submit a tentative study plan for the entire duration of the degree. Students will indicate which focus area they are interested in and which electives they would like to take. During orientation week, advisors will meet with each student to review and approve the proposed study plan. Students should continue to consult their advisors throughout their time at Rice to revise their study plans as necessary. Consultation is especially important before enrollment in courses for the next semester. In addition to faculty visits, regular faculty/student meetings are scheduled by the PSM Office to facilitate continued dialogue between the advising faculty, the students, and the PSM Office. Enrolled students will be assigned to each new incoming student as a mentor during orientation week.

Students identified to not be making adequate progress must meet with the PSM Office and advising faculty to determine a plan with goals and deadlines on how to get back on track.

INTERNSHIP PROGRAM

Students should refer to the Professional Science Master's Program Internship Handbook, which outlines the stages of the internship process, provides copies of necessary forms, and lists guidelines for the employer.

A. Internship Requirements

In addition to coursework, we require a three to six month internship as part of the Professional Science Master's program. This internship should provide the student with practical experience in an industrial or governmental environment, depending on the degree program, and bring about stronger university ties between the university and these organizations.

Internships will typically begin in the summer session after the first year of coursework. Six- month internships begin in the summer and end in December. The student would then complete the final semester of coursework in the spring semester. A three-month internship might take place during the summer session, allowing a student to complete the third semester of coursework in the fall. Alternatively, a three-month internship might begin midway through the summer session and end sometime during the fall. In most cases, the sponsoring company will financially support the intern during the internship period.

Full-time students who have adequate previous industrial experience, or working professionals enrolled on a part-time basis, may request to substitute an independent project for the internship requirement by submitting necessary information to the program committee and obtain approval from the appropriate track director. Students may enroll in classes while completing the approved project.

Students hoping to perform their internship in a non-industrial setting should submit a memo to the program committee outlining the proposed internship and its relationship to the student's professional development to request permission for this variance.

Only students in good standing will be permitted to accept an internship position. Determination of a student's standing will include assessment of the student's GPA (a minimum average of a B- (2.67) is required) and class participation in the Professional Master's Seminar. Furthermore, students must demonstrate a significant amount of effort in obtaining an internship.

If a full-time student is participating in an internship during the spring or fall semester, the student should register for the PSM internship course, NSCI 510, during that semester. This step will insure that the student maintains full-time student status and remains eligible for

student loans and Rice health insurance. The student will not be charged full tuition during this semester, only a minimal charge to maintain full-time status.

B. Finding an Internship Position

Students are encouraged to begin searching for an internship during their first semester of coursework. Students must demonstrate a significant amount of effort in obtaining an internship. Interviewing may begin as early as the first semester, but should be underway no later than midway through the second semester. Rice's Center for Career Development will help students identify potential positions, prepare resumes, and train for interviews. Before the end of the first semester, students should have attended several career-related workshops offered by the Career Development Center. During the first semester of study, the student should submit a Student Learning Plan (which serves as an Internship Outline) and a resume to the PSM Program Director and schedule an appointment with the Center for Career Development to have their resume reviewed.

The PSM Office will establish regular checks on progress made by students in reaching out to corporate representatives, board members, *et al.* to make sure students work consistently on building their network and reaching out to potential employers.

The internship position should be directly related to the student's area of study and suited to their career interests in a company, government agency, or national laboratory. Students should avoid internships that involve proprietary information or technologies that cannot be revealed to the faculty advisor or prospective employers. Although working with proprietary information can involve exposure to cutting edge developments, the requisite confidentiality defeats the purpose of providing the student with an experience that can be used to illustrate the student's qualifications for other professional opportunities and creating knowledge that can be shared with others, which most master's projects in all fields seek to do. Students who wish to undertake an internship that involves work that cannot be reported in an internship report must have the internship approved by their faculty advisors. It is not acceptable to turn in reports that omit the scientific or technical work done (the evidence that the student has applied his or her academic knowledge) on the grounds that the work is confidential.

Students will also have several opportunities to make contact with potential employers through the Rice's Career Fairs, Professional Science Master's Seminars, PSM receptions and luncheons, PSM Board Members, university events, alumni contacts, and course professors. Students can also monitor job opportunities through Rice's Career Development Center and are encouraged to make use of the career/job research tools provided by them.

C. Internship Evaluation

Students and employers will be required to provide progress reports during and immediately following the internship period. These forms, listed below, are provided on the program web site

and in the Professional Science Master's Program Internship Handbook. **It is the student's responsibility to insure that <u>all</u> forms are submitted to the program committee on time.**

- <u>Internship Outline</u> – this document should be submitted by the following dates (Fall-October 15th of the first semester, Spring- March 15th for the first semester).
- <u>Internship Definition Document</u> - this document must be submitted and approved by the program faculty director BEFORE the student accepts the internship position
- <u>Interim Evaluation Form for Employers</u> – to be turned in midway through the internship period
- <u>Interim Evaluation Form for Students</u> – to be turned in midway through the internship period
- <u>Final Evaluation Form for Employers</u> – to be turned in within one week after completion of the internship period
- <u>Final Evaluation Form for Students</u> – to be turned in within one week after completion of the internship period

Academic Internships/Independent Projects

Students using an independent project/academic internship to fulfill the internship requirement will use the following forms to propose a project and report progress on the approved project.

- <u>Internship Project Definition Document</u> – this document should contain the signature of the track director confirming that an independent project / academic internship is approved to fulfill the internship requirement as well as the signature of the faculty mentor under whom the student is conducting his project
- <u>Project Update Report</u> – to be turned in 6 weeks before the start of the final semester of study.
- Evaluation forms as listed above

A timeline for the completion of each form will be forwarded to each intern by the program coordinator.

Students will not be permitted to resume coursework and cannot graduate until all forms have been received. Failure to submit these documents in a timely manner will result in the student being put on probation, and a letter stating this status will be put into the student's file. If the student continues to be delinquent in submitting the required forms, the track director, after consultation with the faculty, can terminate the student from the program.

PROJECT REPORTS AND PRESENTATION GENERAL INSTRUCTIONS FOR ALL PROGRAMS

Objectives for Student Reports and Presentations

At the conclusion of the internship or independent project, students must present a summary of their project in both oral and written form. The goals are to:

a) Test the student's abilities to organize and present information to different audiences,
b) Test the student's ability to make recommendations based on business goals, and
c) Evaluate the integration of academic knowledge and industry or not-for-profit experience obtained during the internship.

Expectations and Grading

Students will be assigned a letter grade for the quality of the two required reports (preliminary and final, described below) and presentation in the required course, Professional Master's Project, NSCI 512.

In the case of an unsatisfactory presentation performance, a second presentation can be scheduled. A second unsatisfactory performance will result in dismissal from the program. PSM Communication Faculty can provide coaching in individual writing and presenting. Students may also enroll in a PSM Communication graduate thesis/project writing group that meets weekly in the semester in which students prepare the reports and presentation.

A preliminary report (10% of grade**)** must be submitted with the Interim Evaluation Documents. This report should provide a company background (including target market and competitors) and a definition of one major assignment, project, or problem. The preliminary report might also contain a planned approach to the assignment or problem, and an explanation of methods that will be used.

Final report(s) (60% of grade) encapsulate both the technical and business aspects of the internship. For internships that are primarily technical in nature, the student must also address how the technical work fits into the business objectives of the employer. For internships that are primarily business in nature, the student must also address how the business development takes advantage of or benefits the technical aspects of the employer. While preparing the final report(s), the student learns how to address audiences of various knowledge levels and concerns, thus preparing the student for her/his role in technical business environments.

The final report(s) are written as a draft and revised version so that students may have opportunities to incorporate feedback from communication faculty and program faculty as follows:

- A **draft of the final report(s)** should be given to the faculty advisor during the middle of the semester following the internship/project completion **(*i.e.*, for fall semester: October 1st and for spring semester: March 1st)**, with a copy to be sent to the PSM Office and PSM Communication Faculty. Within 4 weeks of submittal, reports will be evaluated by faculty and returned to the student for editing.
- The **revised final report(s)** should be submitted one week before the student's oral presentation to the Degree Program Advisor with copy to the PSM Office for grading.

An oral presentation (30% of grade) will be given to an audience consisting of both scientific and business professionals as well as fellow students and professors.

- The PSM Office will schedule student presentations during the Professional Master's Seminar.
- One week before giving the presentation, the student is required to complete at least one practice session with the PSM Communication Faculty or Center for Academic and Professional Communication (CAPC) consultants.

Detailed Description of Oral Presentation (SG, EA, and SPS Degree Programs)

(Students in BHP Degree Program should see the description for Presentation under BHP Report Requirements)

Audience: Faculty members of the PSM Oversight Committee, faculty whom a student has worked with in the internship project, local members of the Board of Affiliates, representatives of the host company, fellow students, professors, and other appropriate guests.

Purpose: To communicate project background, problem definition, steps in investigation, and recommendations based upon technology and business goals. Technical data are presented to support the recommendations. The student must consider the audience's expectations as well as its knowledge of business and technology.

Length: 20-25 minutes, plus 5-10 minutes for questions and answers (total length not to exceed 30 minutes).

Detailed Description of Preliminary Report (All Degree Programs)

Audience: Program Director and the student's Faculty Advisor

Purpose: To communicate the scope of work accomplished on the project problem, the timeline for finishing the work (or handing it over to another person in the case of a continuing project), and the principal links between courses the student has taken and the work accomplished in the internship. This connection constitutes the student's contribution to knowledge about the relationship between academic study and its applications, parallel to the intellectual insights otherwise documented in a thesis submitted for a master's degree in other fields.

Length: 1-2 pages

Content: The scope of work accomplished on the project problem

(a) The timeline for finishing the work (or handing it over to another person in the case of a continuing project)

(b) The principal links between courses the student has taken and the work accomplished in the internship

(c) Short profile of the company

Sample Format:

1st paragraph: A short description of the company and the type of major project the student has been assigned. In some cases, students have been given two or three small projects to enable them to experience a range of types of work the company does.

2nd paragraph: Summary of the degree of completion of the project and the general argument the student expects to make about the types of connections between the courses taken and the project(s) done.

3rd paragraph: Estimate of work to be done in the remaining period, request for assistance needed (if any), problems to be solved (for example, approval process for disclosing information from the company), and so on.

References: Pages 69 to 77 of *Leadership Communication by* Deborah Barrett, ISBN 0-07-291849-7. One copy is available for reference in the PSM office.

Alternatively, consult Chapter 20, "Preparing Reports" (beginning on page 719) in *Technical Communication*, 6th edition, by Rebecca E. Burnett, ISBN 1-4130-0189-0, especially pp. 742-743 on progress reports.

Detailed instructions for Final Reports <u>vary by degree program</u>. *Students should read the instructions for their particular degree program in the pages that follow.*

EA and SPS Final Internship Reports

Students in the EA and SPS degree programs will submit two related but independent final reports, as defined by their intended audiences: a business report (up to 12 pages, double-spaced) and a technical report (up to 15 pages, double-spaced).

A. Final Report for Business Audience

Primary Audience: Management or decision-maker with whom a student has worked in the internship project

Secondary Audience: Faculty with whom a student has worked in the internship project and Directors of specific degree program

Purpose: (1) To communicate an understanding of the central challenge in the project (if analysis was required), work done, and possible recommendations based on business goals and business audience's knowledge and expectations.

(2) To relate the business goals to the technical aspects of the project/company.

Content: Executive Summary (1-2 pages, double-spaced) and Report (approximately 10-12 pages, double-spaced). Uses typical business document format or format of host company. Must include a specific section describing the technical component to which the business development applies.

Sample Format:

Executive Summary

In same order as report, discusses all major items at a high level; stands alone.

Report

Introduction:

Sets stage by introducing project background including context within the company, what led to the project and /or problem to be solved, statement of the project, steps in investigation, solution (introduces product/process), benefits and or business reasons for project. No extensive company background is required.

Body:

Necessary discussion of recommended solution (*i.e.,* brief explanation of product or process technology and rationale for technology with focus on business and financial aspects). This section should explain the basis for the project and issues involved in carrying out the project—these may help to form the justification for the work within the context of the company's goals. This section might include opportunity costs; risk analysis (health, environment, legal); a summary of regulations surrounding product or a technical model on which product/process is based; a definition of target market and market potential; explanation of state-of-the-art of technology (with limited detail and with vocabulary aimed at a non-technical audience); comparison/contrast of this solution with that of competitors; competitive advantages (such as patents or other barriers to entry into the market); financial requirements for execution (may include cost/benefit analysis); alternative methods of

executing (with cost/benefit analysis); steps in execution; and explanation of results or work done.

Technical Section:
Include the following and any additional matters of relevance:

- The relationship and merits of the project to the company's overall technical objectives and goals
- How the business solutions/recommendations impact the technical focus of the company or project

***Conclusion*:**
Recap of recommended solution(s) (*i.e.,* products and processes) and the business rationale. May include 'next steps.'

Appendices:

Add any appendices illustrating results or related information necessary for acting upon the recommendation or understanding the report's conclusion.

Writing Opening Paragraphs:

Within the opening paragraphs of the executive summary and the report, the student should discuss ways in which his or her project fits within the context of the company's ongoing work. (This opening is brief — approximately two to six sentences in the executive summary and approximately two to four paragraphs in the discussion section.)

This context should provide your audience with the following information:

- Briefly explains the company situation that led to the student's project;
- Provides a statement of the project;
- Discusses the purpose of the project — for example, how it contributes to company goals or goals of other projects;
- Gives reasons for the project's value to the company.

Do not give extremely general background information. Remember that management knows the company's background. For example, if the internship had been done on a campus project, a report addressed to Rice University President David Leebron would NOT open with a sentence that says,

> *Rice University is located in Houston, Texas, and offers both undergraduate and graduate degrees.*

President Leebron already knows these facts. However, if the student had been exploring the costs and benefits associated with meeting green architectural standards in constructing the two proposed new colleges, the executive summary might begin as follows:

> *As Rice University began the planning process for building two new residential colleges, its Architectural Planning Committee (APC) not only considered the capital investment required but also the impact of high operational costs. The APC was especially concerned about the impact of rising energy prices. Green architecture could prove beneficial in keeping operational costs at a reasonable level, regardless of energy price fluctuations; and green architecture has the added benefit of minimizing environmental impact. Given the potential advantages, the APC strongly urged the Facilities and Engineering Department (FED) to analyze the costs and benefits of using green architecture in its design.*
>
> *The FED Director assigned me to a project with two other staff members to identify both the costs of meeting standards for green architecture and the associated energy savings that might be gained over 5, 10, and 15 years under a range of energy prices.*

Such an opening would connect the president's knowledge that two new buildings were on the horizon with the specific institutional problem (cost containment in the event of rising energy prices) and the student's project. The openings of the executive summary and the introduction to the discussion section of a report for a business audience should always accomplish this task.

The opening to the report might begin the same but add greater detail about the background:

> *As Rice University began the planning process for building two new residential colleges, its Architectural Planning Committee (APC) not only considered the capital investment required but also the impact of high operational costs. The APC was especially concerned about the impact of rising energy prices. Although predictions were that energy prices could fall below $50 a barrel by 2009, the APC saw ample evidence that utility prices in the coming 15 years could fluctuate widely. The APC wanted to take these fluctuations into account in its planning.*
>
> *One area that needed exploring was that of green architecture.The APC suggested that green architecture be explored because of its potential in keeping operational costs at reasonable levels (regardless of energy price fluctuations) and also for its ability to minimize environmental impact. Given the potential advantages, the APC strongly urged the Facilities and Engineering Department (FED) to analyze the costs and benefits of using green architecture in the new colleges' construction.*
>
> *The FED had a limited timeframe within which to prepare specifications for the two new colleges before requesting proposals from architectural firms. To take into account the possible increase in energy costs, the FED decided to evaluate the desirability of requiring that the plans meet standards for sustainability as set out in the Leadership in Energy and Environmental Design (LEED) certification program. I was assigned to the FED department and worked with two staff members to investigate the possible cost savings to be obtained through construction of colleges that meet the LEED criteria….*

NOTE: Some internships complicate the challenge of reporting on work done. For example, one student was assigned several small projects in different areas of a department so that she would gain breadth of experience. While the variety was valuable, the student was concerned about how to present a unified report on these projects. She was able to connect them by reporting them as projects that featured different problems in the permitting process. Another student who had worked for a not-for-profit agency as well as for a company was able to show how the two different entities contributed to land conservation efforts.

Working on proprietary projects also creates difficulties. Another student had worked on a highly proprietary project (which is not such a great idea since most students want to be able to tell other prospective employers about work accomplished during the internship). This student had to show her business report as well as the technical report, written to the head of the company, to the faculty advisor and program coordinator. As a result, her presentation had to be more vague, and her fellow students could not gain from the technical content of her work.

Reference: Pages 322, 332 – 342, and 235 – 258 from *Technical Communications in the Global Community* by Deborah C. Andrews, 2nd edition, ISBN 0-13-028152-2. One copy is available for reference in the PSM office.

B. Final Report for Technical Audience

Primary Audience: Faculty with whom a student has worked in the internship project and Directors of specific degree program.

Secondary Audience: Manager or decision-maker from company or department in which the project was performed

Purpose: (1) To communicate project background, problem definition, steps in investigation, and solutions with an emphasis on technology and fit with company's or organization's product or technical goals.
(2) To relate the technical work to the overall business objectives of the project/company.

Content: Abstract (1/2 - 1 page, double-spaced) and report (not more than 15 pages, double-spaced) in scientific report format. This report should demonstrate the student's scientific knowledge that has been applied in the project, including any calculations or analysis required. Must include a specific section describing the business aspect to which the technical work applies.

Reference: Pages 329 – 333 and Chapter 7 from *Technical Communications in the Global Community* by Deborah C. Andrews, 2nd edition, ISBN 0-13-028152-2. One copy is available for reference in the PSM office.

How to Write and Publish a Scientific Paper by Robert Day and Barbara Gastel, Sixth Edition, ISBN 0-313-33027-9.Several copies are available in the PSM office.

Sample Format:

1. Abstract - overview of company problem or need, steps in project, the recommended solution, and rationale for solution. Limit: 250 words.
2. Project Background
   - 2.1. Description of organizational context including company background, company products and factors leading to project. (1-2 pages)
   - 2.2. Needs for project (probably 3 to 4 pages):
     - 2.2.1. Company goals in product development or technical problems in company products/processes in need of solutions
     - 2.2.2. Steps in project definition
     - 2.2.3. Resulting technical goals
3. Report on the technical solution to the defined problem and goals. (probably 4 to 5 pages)
4. Business Section (probably 3 to 4 pages)
   - 4.1. The relationship of the project to the companies overall business strategy and goals
   - 4.2. The merits of the project in light of the technical and/or strategic goals of the company—*i.e.,* costs and benefits
   - 4.3. How the project might benefit the company if recommendations or solutions were executed

4.4. Recommended steps in executing the recommendations

4.5. Resources needed for executing the recommendations

5. Bibliography

6. Appendices

Subsurface Geoscience Final Internship Reports

To complete your SG PSM degree, one comprehensive report that includes both **business *and* technical aspects** of your internship is required (exceptions for non-typical projects that lack a business or technical aspect are described on the following page).

Prior to submitting the report, all students are required to have the product reviewed by the Center for Academic and Professional Communication or the PSM program communication faculty. In addition, students are also required to have the presentation reviewed and practiced with either communication program.

Late submissions will incur penalties and could impact graduation. Submission turned in after the last day of finals will not be accepted and therefore the student will not graduate on time.

Audiences:
a) Management or supervisor/faculty internship advisor with whom a student has worked in the internship
b) SG program faculty advisor

Purpose:
a) To communicate project background, problem definition, steps in investigation, and solutions with an emphasis on technology and fit with company's or organization's product or technical goals
b) To relate the technical work to the overall business objectives of the project/company

Content: This report should demonstrate the student's scientific/technical knowledge that has been applied in the project, including any calculations or analysis required. Must include a specific section describing the business aspect to which the technical work applies.

Length: No longer than 15 double-spaced pages, not including figures, graphs, tables, references, and any appendices.

Sample Report Format:

Summary (~1 page)
In the same order as the report, the summary should discuss the overview of the company, how the intern's work relates to goals of company, and major accomplishments in projects. Should stand alone.

Example of summary contents:

- Where you did your internship and description of the organization and how you fit into it,
- What was the goal for your internship,
- What specific project did you work on and how it fit with the master's program,
- What you achieved during your internship (product created, work completed, *etc.*), and
- What future steps on your project will be done later either by someone else in the organization or by another researcher or organization.

***Project Background, Context, and Need for Project* (~2-3 pages)**

- Description of organizational context including company background, company products and factors leading to project
- Company goals in product development or technical problems in company products/processes in need of solutions
- Steps in project definition
- Resulting technical goals

***Technical solution* to the defined problem and goals (~4-5 pages, not including figures/tables)**

- Demonstration of student's technical expertise through data analysis and discussion
- Geoscience and/or geophysical skill application, with data display, graphs and tables, with captions

***Business Section* (~ 3-4 pages)**

- The relationship of the project to the companies overall business strategy and goals
- The merits of the project in light of the technical and/or strategic goals of the company—*i.e.,* costs and benefits
- How the project might benefit the company if recommendations or solutions were executed
- Recommended steps in executing the recommendations
- Resources needed for executing the recommendations

EXCEPTIONS FOR NON-TYPICAL SG INTERNSHIP PROJECTS

A typical Subsurface Geoscience Final Report is expected to have **both** technical and business aspects. However, if a student has no opportunity within the approved internship to conduct technical work or business-related work, he/she should seek permission from his/her faculty advisor to write a report emphasizing the predominant aspect of the non-typical project. (This exception might apply to a student conducting academic research for a faculty member, working in the business department of a company, etc.)

*The non-typical report should emphasize the **predominant aspect** of the internship, i.e. business or technical, and be written in-depth with appropriate sections as outlined below:*

Business-Only SG Project Report

***Executive Summary* (~1 page)**

In the same order as the report, the summary should discuss the overview of the company, how the intern's work relates to goals of company, and major accomplishments in projects. Should stand alone.

***Introduction* (~2-3 pages)**

Sets stage by introducing project background including context within the company, what led to the project and /or problem to be solved, statement of the project, steps in investigation, solution (introduces product/process), benefits and or business reasons for project.

***Body* (~4-6 pages)**

Necessary discussion of recommended solution (*i.e.,* brief explanation of product or process technology and rationale for technology with focus on business and financial aspects). This section should explain the basis for the project and issues involved in carrying out the project—these may help to form the

justification for the work within the context of the company's goals. This section might include opportunity costs; risk analysis (health, environment, legal); a summary of regulations surrounding product or a technical model on which product/process is based; a definition of target market and market potential; explanation of state-of-the-art of technology (with limited detail and with vocabulary aimed at a non-technical audience); comparison/contrast of this solution with that of competitors; competitive advantages (such as patents or other barriers to entry into the market); financial requirements for execution (may include cost/benefit analysis); alternative methods of executing (with cost/benefit analysis); steps in execution; and explanation of results or work done.

Brief Technical Section **(~1 page)**
Include the following and any additional matters of relevance:

- The relationship and merits of the project to the company's overall technical objectives and goals
- How the business solutions/recommendations impact the technical focus of the company or project

Conclusion **(~1 page)**
Recap of recommended solution(s) (*i.e.,* products and processes) and the business rationale. May include 'next steps.'

Appendices **(optional)**
Add any appendices illustrating results or related information necessary for acting upon the recommendation or understanding the report's conclusion.

Technical/Academic-Only SG Project Report:

Abstract **(~1 page, double-spaced)**
A concise summary of the report, including project context, technical goals, materials/methods/approaches, results, implications and significance of outcomes, and real or potential applications. Should stand alone, without references to published literature or figures/tables.

Project Background **(~2-3 pages)**
Context for project, including background of the problem or investigation and factors leading to project. Should include appropriately referenced literature review. Include the researcher's goals for project development or solution to technical problems in field.

Body/Technical solution **to the defined problem and goals (~4-6 pages)**

- Discussion of methods and approach to problem
- Demonstration of student's technical expertise through calculations, data analysis, and discussion
- Geoscience and/or geophysical skill application, with data display, graphs and tables, with captions

Conclusion **(~1 page)**

- Discussion of how project supports applications of knowledge or development of better systems/techniques to real-world problems (i.e., to problems outside of academia, if project was in academic setting). May include 'next steps.'

Reference: Pages 329 – 333 and Chapter 7 from *Technical Communications in the Global Community* by Deborah C. Andrews, 2nd edition, ISBN 0-13-028152-2. One copy is available for reference in the PSM office.

How to Write and Publish a Scientific Paper by Robert Day and Barbara Gastel, Sixth Edition, ISBN 0-313-33027-9. Several copies are available in the PSM office. -

Bioscience and Health Policy Final Internship Reports

To complete your master's degree two reports—a business and a technical report—and a presentation are required. Preliminary copies of the reports are due seven weeks after the beginning of the **semester (Fall – October 15th; Spring – March 1st)**. Final versions are due one week after the oral presentation. Presentation will be scheduled the 1st and 3rd Wednesdays in April or November at random.

Prior to turning in the preliminary copy and final copy of the report, all students are required to have the product reviewed by the Center for Academic and Professional Communication (CAPC) or the PSM program communication faculty. In addition, students are also required to have the presentation reviewed and practiced with either communication program. After the presentation, only one week is allowed for revisions prior to submitting the final version of the reports. Please address feedback and questions from the presentation in the final version. Late submissions will incur penalties and could impact graduation. Submission turned in after the last day of finals will not be accepted and therefore the student will not graduate on time.

1. **Report 1: The Business Report**
    - Traditionally this report is the shorter of the two required documents. It should be between 6 and 8 pages long. The report should be double-spaced in 10-12 point font. All figures and legends should be clear and legible.
    - This report should provide an overview of the internship and include the information below:
        - Where you did your internship and description of the organization and how you fit into it,
        - What was the goal for your internship,
        - What specific project did you work on and how it fit with the master's program,
        - What you achieved during your internship (product created, work completed, *etc.*), and
        - What future steps on your project will be done later either by someone else in the organization or by another researcher or organization.
    - Information in this report should be the basis for the presentation.

2. **Report 2: The Technical Report**
    - Traditionally this report is the longer of the two final documents. The length should be between 12 and 20 pages. The paper should be double-spaced in 10-12 point font. All figures and legends should be clear and legible.
    - The technical report should be viewed as a policy report. It should highlight the area the student examined during their internship and their choice of a policy question to research further. The report should include a literature review of the policy issue including multiple perspectives (various sides of the argument). The report should conclude with general policy recommendations for addressing any issues targeted as well as future areas for research or discussion.
    - This report should provide a larger context for the internship efforts and why the issue(s) studied during the internship is (are) important.

3. **Presentation**

    The purpose of the presentation is to communicate the project background, policy challenged addressed and how the work contributed to understanding of the issue.

If a student participates in multiple internships, then they can chose to focus on a policy topic which links the work together or focus on just one internship project.

- The presentations should be 20-25 minutes in length allowing 5 minutes for questions at the end.
- The presentation should include professionally quality slides to guide the discussion.

MANAGEMENT ELECTIVES

Through special arrangement with the Jesse H. Jones Graduate School of Management, Professional Master's students have the opportunity to register for several elective courses offered through the MBA program, such as:

MGMT 609	Managing Energy Transitions
MGMT 611	Geopolitics of Energy
MGMT 633	Life Science Entrepreneurship
MGMT 661	International Business Law
MGMT 667	Competitive Strategy in Emerging Markets
MGMT 669	Business Strategy in Energy Industry
MGMT 670	Operations Strategy
MGMT 678	U.S. Health Care Management
MGMT 721	General Business Law
MGMT 733	Operation Strategy & Leadership, and others
MGMT 734	Technology Entrepreneurship

NOTE: Courses vary. Some listed courses may not be offered every year, and others may be offered that satisfy the requirements with pre-approval. Students should consult with their academic advisors before enrolling.

MBA students receive priority registration, so PSM students will only be permitted to register on a space available basis. Management courses are NOT open for web registration for non- MBA students. **PSM students must get approval from the course faculty either in person (signed special registration form) or approval via email, once the student has received approval they should contact MBA Director of Student Records & Associate Registrar, Maria Sanchez Johnson, who will verify the course offering and class meeting times. The student must send Maria (via email at maria.johnson@rice.edu) a completed graduate special registration form with either the faculty's signature OR with an attachment of the approval email.**

Maria Sanchez Johnson
(713) 348-5246
maria.johnson@rice.edu

Ms. Johnson will process the registration.

It is very important to ATTEND THE FIRST CLASS of a management course, whether you are registered or not. Some professors are very strict and will not allow a student to enroll if he/she has not attended the first class.

OTHER REGULATIONS

Failure to follow the deadlines listed in the "Rice PSM Internship Requirements" will result in the student being put on probation, and a letter stating this circumstance will be placed in the student's file. If the required documentation is not submitted within two weeks, the PSM Office, after consultation with the faculty, can terminate the student from the program.

All graduate students are expected to maintain continuous enrollment, unless an official leave of absence has been granted. The procedure for obtaining a leave of absence is outlined in the General Announcements.

Problems or conflicts may arise during a student's graduate education. Students should take responsibility for informing the appropriate faculty of any such problems. All parties involved should work together amicably with the goal of resolving the problem informally if at all possible. When attempts to resolve a problem informally do not meet with success, the grievance procedure outlined in the General Announcements will be adopted.

The advising faculty of all four programs forms the Oversight Committee of the PSM program that meets at least once a year to review the progress of the students, discuss student feedback, and assess the curriculum of each track to implement updates where needed. Student performance is monitored every semester to ensure successful completion of each student's degree requirements.

PLAGIARISM

At all universities in the U.S., including Rice University, plagiarism is considered academic misconduct. Students are expected to avoid plagiarism, either intentional or accidental. As described in Rice's Honor Code, plagiarized work can result in a failing course grade, expulsion, rejection of a paper submitted for publication, denial of an advanced degree, or loss of job. It is increasingly serious now that the Internet has made plagiarism easier than ever before.

View various forms of plagiarism and what to do to avoid its serious consequences at https://gpsdocs.rice.edu/orientation/Plagiarism_Hewitt_document.pdf

The Rice Honor Code is taken very seriously, and all accusations of plagiarism go before the Rice Honor Council, made up of representatives from the student body and the faculty.

HONOR SYSTEM

The honor system, one of the oldest and proudest traditions at Rice, is administered by the Honor Council, whose student members are elected each year by the student body. Adopted by a student vote in 1916, the honor system has remained essentially the same since that time but for changes in the procedures and membership of the Honor Council.

Students take all written examinations and complete any specifically designated assignments under the honor system. By committing themselves to the honor system, all students accept responsibility for assuring the integrity of the examinations and assignments conducted under it. The Honor Council is responsible for investigating reported violations and for conducting a hearing when the facts warrant. The Office of Student Judicial Programs, which reviews the results of the investigations and hearings, considers the council's recommendations when issuing penalties.

The Honor Council conducts an ongoing program to acquaint new students and faculty with the honor system. The Honor Code and other related information and resources are located at the homepage of the Honor Council: http://honor.rice.edu/

CODE OF CONDUCT

The Office of Student Judicial Programs oversees the judicial system and enforces the Code of Student Conduct, which governs the administration of student order and discipline and participates in title IX investigations. The Code of Student Conduct applies to all students, including undergraduate, graduate, and transfer students; those enrolled in professional and Continuing Studies programs; and visiting students, Visiting Post Baccalaureates, second degree students, and auditors, from the time they arrive on campus for orientation until their degree is conferred or they have permanently left Rice. Organizations also are subject to this Code. All enrolled students also are subject to Rice University policies, rules, and regulations.

Alleged violations of university or college rules are handled in accordance with the Code of Student Conduct. Students may appeal decisions as described in the Code of Student Conduct. Rice retains ultimate authority in all matters of discipline and over all actions that affect its educational function or the safety and wellbeing of members of the university community.

The Code of Student Conduct and other related information and resources are located at: www.students.rice.edu/students/Conduct.asp
After Rice's grievance process has been exhausted and documented, students may also pursue an external complaints process.

Important Information available on the Online General Announcements:

Academic Probation and Dismissals and Petitions and Appeals
https://ga.rice.edu/graduate-students/academic-policies-procedures/regulations-procedures-all-degrees/

Title IX Information:

Rice encourages any student who has experienced an incident of sexual, relationship, or other interpersonal violence, harassment or gender discrimination to seek support. There are many options available both on and off campus for all graduate students, regardless of whether the perpetrator was a fellow student, a staff or faculty member, or someone not affiliated with the university.

Students should be aware when seeking support on campus that most employees are required by Title IX to disclose all incidents of non-consensual interpersonal behaviors to Title IX professionals on campus who can act to support that student and meet their needs. The therapists at the Rice Counseling Center and the doctors at Student Health Services are confidential, meaning that Rice will not be informed about the incident if a student discloses to one of these Rice staff members. Rice prioritizes student privacy and safety and only shares disclosed information on a need-to-know basis.

If you are in need of assistance or simply would like to talk to someone, please call Rice Wellbeing and Counseling Center, which includes Title IX Support:
Extension 3311 or (713) 348-3311

Policies, including Sexual Misconduct Policy and Student Code of Conduct, and more information regarding Title IX can be found **here**