



E&M

engineering & Management

Student Handbook

2009 - 2010

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Clarkson
UNIVERSITY
*defy*convention

ENGINEERING AND MANAGEMENT

Clarkson University
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PROFESSIONAL OBJECTIVE:

Career growth and flexibility in areas related to manufacturing, project engineering, field service engineering, supply chain systems integration, and technological entrepreneurship.

EDUCATION:

Bachelor of Science, Engineering & Management

- **Science & Mathematics** – Calculus, Differential Equations, Physics, Chemistry, and Statistics
- **Engineering** – Computer Applications, Electrical Science, Fluid Mechanics, Materials Properties, Statics, and Thermodynamics
- **Management** – Accounting, Business Law, Corporate Finance, Economics, Information Systems Management, Operations, Marketing, and Organizational Policy
- **Liberal Studies & Technical Communications** – Knowledge Area courses, Psychology, and Public Speaking

SPECIALIZATIONS:

Students can also earn a minor in Environmental Science, Quality-based Project Management, or other areas; a concentration in Global Supply Chain Management; or follow tracks to specialize in an area such as Construction Management or Technical Sales.

EMPLOYMENT:

Graduates secure positions in four general areas:

Project Management – Construction Management, Contract Administration, Cost Engineer

Supply Chain Management – Design, Customer Service, Distribution, Transportation, Systems Integration

Sales & Marketing – Technical Sales, Technical Marketing, and Consulting

Manufacturing & Production – Industrial and Project Engineer, Production Supervision, Project Planning, Quality Control, Inventory Control and Procurement

ALUMNI STATISTICS: (Based on 2001 Survey Results)

Over 3,500 alumni since 1958

A significant number own or have owned businesses

47% are employed in areas of Sales, Marketing, and Procurement

20% are employed in areas of Manufacturing and Production

REFERENCES:

Dr. Amy K. Zander, Director (zander@clarkson.edu)

Misty Spriggs, Associate Director (mspriggs@clarkson.edu)

Adrienne Boswell, Academic Advisor & Office Manager (aboswell@clarkson.edu)

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WELCOME to Engineering & Management at Clarkson University


It is my pleasure to welcome you to the Engineering & Management (E&M) program at Clarkson University. Clarkson's Engineering & Management (E&M) program is ideal for those who desire breadth and flexibility in a career centered on leadership and technology. The major was established in 1954 to meet the growing needs of industry for individuals with strong skill sets in both engineering and business. Graduates are prepared to integrate the rapidly changing technical and managerial aspects of an organization.

The E&M program utilizes Clarkson's traditional strengths, stressing engineering principles and technical problem-solving in conjunction with quantitative and qualitative managerial decision-making. Students receive a balanced education involving course requirements from each of the major disciplines of engineering, business, science, and liberal arts. The carefully planned curriculum is taught by faculty within their respective areas, with the exception of the year-long project-based learning experience for first-year students, which is taught within the E&M program.

I hope you enjoy your college education at Clarkson and encourage you to make the best of your experience here. This handbook has been created to help answer questions you might have. If the information you are seeking isn't in this book, consult the references listed at the end or see your advisor; Misty Spriggs in BH Snell 119, Adrienne Boswell in BH Snell 103. You may also stop by my office in BH Snell 101.

I look forward to attending your graduation. Best wishes for a successful college career.

Sincerely,

A handwritten signature in black ink that reads "Amy K. Zander". The signature is written in a cursive, flowing style.

Amy K. Zander, Ph.D., P.E.
Director, Engineering & Management

A Vision of a Clarkson Education

The Clarkson University educational experience is designed to provide talented and ambitious students with the knowledge and skills necessary to achieve positions of leadership within their chosen profession. The combination of Clarkson's strong technologically rich curricula and state-of-the-art teaching and research facilities, coupled with an unparalleled commitment to a friendly learning environment and to students' personal development, uniquely prepares Clarkson graduates to excel in their chosen professions and to lead rewarding and creative lives.

In addition to a mastery of the core knowledge within his or her field, a Clarkson education provides each student with the opportunity to:

- solve real-world, open-ended problems that require creativity and risk taking, including participation in state-of-the-art research under the direction of distinguished faculty;
- develop and refine exceptional communication skills with an awareness of potential cultural differences;
- work productively within and lead interdisciplinary and multi-disciplinary teams possibly composed of members with diverse interests and backgrounds;
- obtain outstanding capabilities in utilizing computing and other 21st century technologies;
- learn through instruction and guidance by nationally recognized faculty who have a commitment to both teaching and research that has made Clarkson a nationally ranked university

A Clarkson student's education is greatly enhanced by a personal and friendly learning environment, within a small, residential, nationally recognized University, which:

- places students at the center of the educational process and where all employees have a commitment to creating an environment that contributes positively to students' overall educational experience;
- draws undergraduates, graduate students, faculty and staff together into a cohesive and stimulating learning community, wherein an atmosphere of scholarship and spirit of research is cultivated;
- supports the acquisition of knowledge through advanced electronic and information technology and innovative instructional approaches;
- provides personal advising and interaction with faculty and staff as well as supportive relationships among students;
- offers many leadership opportunities through co-curricular groups and activities;
- respects and learns from its community of diverse people, backgrounds and cultures

Together, these provide a unique educational experience that is directed toward developing the whole person.

Engineering & Management Program Educational Objectives

These program educational objectives were developed with input from alumni, employers, faculty and staff, industry leaders and students. They describe the career and professional accomplishments that the E&M program is preparing graduates to achieve. It is our goal that upon graduation you will be able to define yourself according to these objectives.

1. E&M graduates apply technical problem solving skills to develop innovative and effective solutions to complex problems.
2. E&M graduates lead multi-disciplinary teams to success by managing team dynamics.
3. E&M graduates effectively communicate information for decision-making both orally and in writing to both technical and non-technical audiences.
4. E&M graduates continuously balance simultaneous demands of today's working environment through multi-tasking capabilities of planning, organizing, managing and controlling resources.
5. E&M graduates combine engineering and business core knowledge to apply quantitative and qualitative methods to process analysis in business systems.
6. E&M graduates make timely, ethical and useful decisions in response to organizational challenges.

Engineering and Management Program Outcomes

These program outcomes describe what students are expected to know and be able to do by the time of graduation. These relate to the skills, knowledge and behaviors that you will acquire in your studies throughout the program.

Students will:

1. have the ability to apply calculus-based math, laboratory science and engineering principles to technical problem-solving
2. gain the knowledge and abilities to lead multi-disciplinary teams
3. understand development and maintenance of relationships among people within and across organizations
4. build a skill set in written and oral communication through coursework, projects, and extracurricular activities
5. balance academic disciplines in science, engineering, business and humanities to prepare for the changing workplace
6. understand financial and information flows within and across organizations
7. learn both quantitative and qualitative analysis methods
8. apply a foundation of business and management principles to making timely, ethical, useful decisions

9. learn to lead and manage organization change

Students will attain:

- (a) an ability to apply knowledge of mathematics, science, and engineering
- (b) an ability to design and conduct experiments, as well as to analyze and interpret data
- (c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
- (d) an ability to function on multi-disciplinary teams
- (e) an ability to identify, formulate, and solve engineering problems
- (f) an understanding of professional and ethical responsibility
- (g) an ability to communicate effectively
- (h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
- (i) a recognition of the need for, and an ability to engage in life-long learning
- (j) a knowledge of contemporary issues
- (k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

Engineering & Management Curriculum (Class of 2010 and later)

	Total Credits	120	Suggested Course Sequence (other sequences are possible)	
Math and Science		31		
CM 131	Chemistry I	4	Fall Year 1	Spring Year 1
CM 132	Chemistry II	4	EM 205	EM 211
MA 131	Calculus I	3	EM 120	EM 121
MA 132	Calculus II	3	MA 131	MA 132
MA 231	Calculus III	3	PH 131	PH 132
MA 232	Differential Equations	3	UNIV 190	PY 151
STAT 383	Applied Statistics	3	FY 100	
PH 131	Physics I	4		
PH 132	Physics II	4	Fall Year 2	Spring Year 2
Engineering		18	EM 350	STAT 383
ES 220	Statics	3	ES 220	UNIV course
ES 250	Electrical Science	3	MA 232	COMM 217
ES260/ES222/EE264	Mat Science/Strengths/Digit Design	3	EM 286	LW 270
ES 330	Fluid Mechanics	3	CM 131	CM 132
ES 340	Thermodynamics	3		
ES 456	Inter. Process Eng. & Design	3	Fall Year 3	Spring Year 3
Engineering Management		32	ES 330	Prof Elective
EM 120	Team-based Design	3	MA 231	ES 250
EM 121	Technological Entrepreneurship	2	EM 333	FN 361
EM 350	Micro & Engineering Economics*	3	ES260/ES222/EE264	EM 331
EM 211	Intro to Enterprise Info Systems	3	MK 320	KA course
EM 286	Organizational Behavior I	3		
EM 331	Operations & Supply Chain Mgmt	3		
EM 333	Operations Research	3	Fall Year 4	Spring Year 4
EM 432	Organizational Policy & Strategy	3	ES 340	ES 456
XX	Professional Electives (3)	9	EM 432	CUSB
Business		18	KA course	Prof Elective
EM 205	Accounting for Decision Analysis	3	Prof Elective	Elective
FN 361	Corporate Finance	3	CUSB	
LW 270	Law & Society	3		
MK 320	Principles of Marketing	3		
CUSB	Business electives (2)	6		
Clarkson Common Experience		15		
UNIV 190	Clarkson Seminar	3		
PY 151	Intro to Psychology*	3		
KA	Knowledge Area Courses (2)	6		
UNIV course	University Course	3		
Other		6		
COMM 217	Public Speaking	3		
XX	Elective	3		
FY 100	Transitions	1**		

* Also is a Knowledge area course

** Required only for First Year students, credit not used toward graduation

Fall – Year 1

EM205 Accounting for Decision Analysis – May be used to satisfy a CUSB MBA or M.S. foundation requirement.) Course is designed for non-School of Business undergraduate majors. An introductory survey of accounting information to guide and improve decision making. Many course topics involve cost planning and control techniques used to evaluate and improve the financial performance of organizations and/or products. Students may not receive credit for EM 205 and AC 202.

EM120 Team-based Design and Innovation – The first in a two-course sequence, this course is required for all first-year students in the Engineering & Management (E&M) Program. Students will undertake a year-long project to design, produce, and potentially commercialize a tangible product. Projects will require the application of both engineering and management principles, and the use of computer technology for the development and analysis of relevant prototypes. Personal computer applications integrated throughout this course include engineering design and test, spreadsheets, word processing, and the Internet. Course objectives are to help students appreciate the entire process of developing technology-based products, learn how to build and manage effective teams, develop a fundamental understanding of computer usage, and to introduce the multiplicity of concepts embodied in the E&M degree program. Primary focus of fall semester is to build functional teams and arrive at a consensus on the conceptual design of the product.

MA131 Calculus I – Functions and graphs; derivative concept and formulas, including chain rule and implicit differentiation; integral concept; the Fundamental Theorem of Calculus; properties and applications of the derivative, including max-min problems and graph sketching; exponential, logarithmic, and inverse trigonometric functions.

PH131 Physics I – Calculus-based general physics course covering elements of Newtonian mechanics and thermal physics. Laboratory experiments keyed to the lectures to illustrate and demonstrate some of the physical principles and concepts.

UNIV190 Clarkson Seminar – The Clarkson Seminar welcomes first year students into a world of cultures, histories, and the global forces that will shape their personal and professional lives beyond Clarkson. Students will learn to define issues within a broad cultural context and gain experience evaluating and interpreting literary and nonliterary texts. Seminar classes will be a small and thematically structured, with an emphasis on discussion, critical reading and thinking, extensive writing, and collaborative work.

FY100 Transitions to College – Focus on group work and team dynamics, this adjustment course is required for all first-year students. Introduces the mission and expectations of the learning process at Clarkson; builds communication and teamwork skills; and provides some fundamental content relating to wellness and relationships during the college experience. Discussion, team activities, leadership opportunities, and interaction with upper-class peer educators form the foundation of the course.

Spring – Year 1

EM211 Intro to Enterprise Information Systems – The distributed, accurate, real time flow of information is a critical success factor for most organizations, from global conglomerates, to rural micro-enterprises. This course will introduce students to enterprise information systems, their components, integration, and use as part of the business process. The focus is on ERP software, (SAP R/3), its application, input devices, implementation issues and use. Hands-on experience with SAP R/3 is integral to this course.

EM121 Technological Entrepreneurship – The second in a two-course sequence, this course is a continuation of EM120 and is required for all first-year students in the Engineering & Management Program. Students will complete a year-long project to design, produce, and potentially commercialize a tangible product. Projects will require the application of both engineering and management principles, and the use of computer technology for the development and analysis of relevant prototypes. Personal computer applications integrated throughout this course include engineering design and test, spreadsheets, database management, word processing, and the Internet. Course objectives are to help students appreciate the entire process of developing technology-based products, develop a fundamental understanding of computer usage, and to introduce the multiplicity of concepts embodied in the E&M degree program. *Prerequisite: EM120*

MA132 Calculus II – A continuation of MA131. Properties and applications of the integral, including areas, volumes, arc length and differential equations; integration techniques, including parts, partial fractions, trigonometric substitution, and numerical integration; indeterminate forms; improper integrals; infinite series and Taylor Series; introduction to polar coordinates, complex numbers, and parametric equations. *Prerequisite: MA131 or MA131S*

PH132 Physics II – Calculus-based general physics course covering elements of electricity and magnetism, waves and optics. Laboratory experiments keyed to the lectures to illustrate and demonstrate some of the physical principles and concepts. *Prerequisite: PH131, Corequisite: MA132*

PY151 Intro to Psychology – Emphasizes the scientific study of the human mind. Appropriate research methods and philosophical questions will be considered. Topics include the brain, memory, perception, development, personality, social behavior, emotion, motivation, psychological disorders, stress, and states of consciousness.

Fall – Year 2

EM350 Micro and Engineering Economics - May be used with EC 151 to satisfy a CUSB M.B.A. or M.S. foundation requirement. Students may not be granted credit for EM350 as well as EC150.) An introduction to microeconomic concepts in a market type economy. Some of the issues covered are the role of supply, demand, market price determination, consumer behavior, production theory and cost, and market structure. This course includes a segment on engineering economic analysis. Engineering students should take this course rather than EC 150 because it provides preparation for the Professional Engineering exam. *Prerequisite: Sophomore Standing*

ES220 Statics – Fundamental concepts of the statics of rigid bodies using a vector analysis approach; force systems, analysis of simple structures, centroids and centers of gravity, free body diagrams, equilibrium, friction and moments of inertia. *Prerequisites: MA131 and PH131*

MA232 Elementary Differential Equations – Solutions and applications of first-order differential equations and linear differential equations with constant coefficients. Laplace transform methods. Introduction to matrix algebra, systems of algebraic equations, eigenvalues and eigenvectors, with application to systems of differential equations. Other topics may include modeling, engineering applications, or numerical methods. *Prerequisite: MA132*

EM286 Organizational Behavior I – An introduction to the processes required to manage contemporary organizations with a focus on individual behaviors as they relate to the functions of planning, organizing, controlling, and leading. The most recent concepts of behavioral science in the practice of management are presented to assist the student in gaining understanding of the pervasiveness of the discipline in all types of organizations and processes. Topics include motivation, leadership, perceptions, personality theory, learning theory, personnel issues, stress management, organizational culture, and decision making. *Prerequisite: sophomore standing*

CM131 General Chemistry I – A general overview of chemistry, including principles and theories as well as descriptive chemistry of important elements and compounds. Laboratory experiments augment lecture topics to provide a small group hands-on learning experience.

Spring – Year 2

STAT383 Applied Statistics I – Descriptive statistics, probability, sampling distributions (large and small), estimation, testing and linear regression. Other topics may include analysis of variance, quality control and categorical data analysis. This course will require use of statistical software. Interpretation of computer output and applications will be emphasized throughout. *Prerequisite: MA132*

University Course – A course which meets the requirements of two different Knowledge Areas, as discussed in the following section.

COMM217 Intro to Public Speaking – This lecture and laboratory course is designed to enhance the individual's effective public communication by giving him or her a variety of speaking roles in different situations. The objective of the course is to develop an awareness of the speaking potential of each student with emphasis on listening ability, nonverbal behavior, idea organization and effective use of language and visual aids.

LW270 Law and Society I – A course designed to provide a basic understanding of (1) the nature, functions and limitations of law and legal systems; (2) the basic relationship among justice, ethics, legal systems and social structure; and (3) the relationship among society, law and business activity. Further, it is designed to enlighten with respect to rules, principles, standards, and doctrines of law fundamental to a free enterprise system. The course covers the substantive areas of constitutional law, torts, contracts, and property and estate law. *Prerequisite: at least sophomore standing*

CM132 General Chemistry II – A continuation of CM 131. Chemical principles, theories, and descriptive chemistry with laboratory experiments to provide additional exposure to lecture topics in a small group environment. *Prerequisite: CM131*

Fall – Year 3

ES330 Fluid Mechanics – Basic principles of fluid mechanics. Topics include statics, forces on a plane and curve surfaces, kinematics of fluid motion, integral and differential representation of conservation of mass, balance of linear and angular momenta, the first Law of Thermodynamics, Bernoulli's equation, dimensional analysis, and elementary viscous flow. Frictional losses, simple pipeline analysis and steady channel flow are covered. Understanding of the physical phenomena is stressed and vector notation is used wherever suitable. *Prerequisites: MA232 or MA231 and ES220*

MA231 Calculus III – Vectors and vector-valued functions; functions of several variables; partial differentiation, including the chain rule, gradients, and maxima and minima; multiple integration, including polar, cylindrical, and spherical coordinates; vector calculus, including Green's, Divergence, and Stokes's Theorems. *Prerequisite: MA132*

EM333 Elements of Operations Research -- Application of optimization models to typical engineering and management situations and problems. Topics include: optimization theory (linear programming, transportation and assignment models), decision analysis under uncertainty, queuing theory and Monte Carlo simulation. *Prerequisites: STAT383 and junior standing; or consent of the instructor*

One of the following Engineering Courses:

ES260 Materials Science and Engineering I – The bonding (ionic, covalent, metallic), micro-structure (crystalline or amorphous) and defects in structure (vacancies, dislocations, precipitates or voids) determine the engineering properties of solids. Course coverage includes crystal structure, solid state diffusion, phase equilibrium and phase transformations of metals, ceramics and polymers. The electrical and mechanical properties are emphasized. *Prerequisites: PH131, CM103 or CM131, MA132*

OR

ES222 Strengths of Materials - Elementary analysis of the strength and deformation of deformable bodies; stress and strain at a point, Mohr's circle, axial loads, flexure, torsion, deflections and column action. Introduction to design concepts. *Prerequisites: ES220 or consent of instructor*

OR

EE264 Introduction to Digital Design – An introductory course covering the fundamentals of computer system hardware. Topics include data representation using number systems and codes, Boolean algebra and logic, digital logic devices, combinational and sequential circuits, arithmetic logic units and simple processor organization including registers, memory, addressing and processing of machine instructions.

MK320 Principles of Marketing – Familiarizes students with various marketing terms, concepts, principles, institutions and practices. Topics covered include: buyer behavior, market research, product planning, pricing, distribution, personal selling and advertising. The changing nature of marketing and the trends in domestic and international marketing are also examined. Experiential exercises are an intrinsic and important part of this course. *Prerequisites: IS/EM211*

Spring – Year 3

Professional Elective – see following section for definition of a professional elective in E&M.

ES250 Electrical Science – Network concepts, DC circuits; mesh and node equations, network theorems, operational amplifiers. Complex numbers, effective values, sinusoids and phasors. AC circuits: phasor diagrams, power. Time domain solution of first order circuits. *Corequisites: MA232, PH132*

FN361 Financial Management – The basic goals of this introductory finance course are to familiarize students with the concepts and tools used in corporate financial management decisions. These include the analysis of financial statements for long-term financial planning, the notion of present value in addition to the relationship between risk and return. The concepts and techniques are, in turn, used to evaluate and made decisions regarding the firm's capital expenditures and capital structure as well as security valuation. *Prerequisites: MA/STAT282 or SB284, EC150 or EC350, and AC205 (or their equivalents) and sophomore standing, or the permission of the instructor.*

EM331 Operations and Supply Chain Management – An introduction to the planning, analysis, and control of production systems. Topics include product and service design, manufacturing processes, design of work systems, aggregate production planning, inventory models and MRP, just-in-time systems, facility layout, scheduling, project management, quality control, and work measurement. Students acquire problem solving experience using microcomputers and commercial software. *Prerequisites: STAT282, IS/EM211, sophomore standing*

Knowledge Area Course – Details can be found following this section.

Fall – Year 4

ES340 Thermodynamics – The fundamental concepts of thermodynamics and their application to pure substances. Topics include: properties of pure substances; work, heat, energy and the First Law of Thermodynamics; technique of First Law Analysis; disorder, entropy and Second Law of Thermodynamics; technique of Second Law analysis. *Prerequisites: MA231 and PH132*

EM432 Organizational Policy and Strategy – A capstone course designed to integrate the functional areas and tools of management studied in previous courses within a strategic planning framework giving due attention to ethical and social responsibility concerns and international business issues. Emphasis is placed on the business environment in a global economy, industry analysis, tactical planning, overall strategic planning, policy establishment and implementation. Case analysis, in the small group setting, is utilized, enabling students to share their expertise and explore their value structure. Students present results via written and oral reports. *Prerequisites: FN361, OM/EM331, OS/EM286, MK320, senior standing*

Knowledge Area Course – Details can be found following this section.

Professional Elective – see following section for definition of a professional elective in E&M.

CUSB Elective – Course from the School of Business (300-level or higher) that meets the needs of the individual student's curriculum.

Spring – Year 4

ES456 Process Engineering & Design – This course is a culminating technical experience for students who have completed a foundation engineering science education (i.e. mechanical, chemical, and electrical courses that are required by traditional engineering majors). Primarily designed for Interdisciplinary Engineering and Management (iE&M) program, this capstone course will require students to learn advanced engineering design principles that focus on solving complex systems-based problems. Concepts such as: design methodology, process flow, customer requirements and specifications, and advanced modeling techniques will be covered in detail during the first half of this course. The classroom lectures and assessments will be supplemented with a real world technical problem that requires application of the knowledge gained in previous engineering science courses, along with the process design principles described above. Requires both written reports and oral presentations. *Prerequisites: ES220, ES250, EM333, and ES330 or ES340*

CUSB Elective – Course from the School of Business (300-level or higher) that meets the needs of the individual student's curriculum.

Professional Elective – see following section for definition of a professional elective in E&M.

Elective (1) – A course selected in consultation with your advisor or as determined by a specified concentration, track or minor.

Professional Elective

A professional elective in the E&M program is defined as:

- Any course in the Wallace H. Coulter School of Engineering of 200-level or higher (prefix ES, ME, AE, CE, CH, EE, BR) for which the student has the prerequisites, except for ES 238 Introduction to Energy Systems, ES 300 Engineering for Non-engineers, EE 268 Machine Intelligence or Stupidity, and BR 200 Intro to Biomedical and Rehabilitation Engineering, Science and Technology;
- Any 300-level or higher EM course:
- HP 390 (3 credits), HP 490 (3 credits).

ES – Engineering Science
ME – Mechanical Engineering
AE – Aeronautical Engineering
CE – Civil and Environmental Engineering
CH – Chemical and Biomolecular Engineering
EE – Electrical and Computer Engineering
BR – Biomedical and Rehabilitation Engineering
EM – Engineering Management
HP – Honors Program

Knowledge Area Courses

Students at Clarkson University are required to take five courses which cover each of the six specified Clarkson Common Experience Knowledge Areas; one University Course (UC) must span two Knowledge Areas. These Knowledge Areas are:

Culture and Societies (CSO)
Contemporary and Global Issues (CGI)
Imaginative Arts (IA)
Science, Technology & Society (STS)
Economics and Organizations (EC)
Individual and Group Behavior (IG)

The E&M curriculum covers two of these Knowledge Areas. Introduction to Psychology fulfills the IG requirement and Micro and Engineering Economics fulfills the EC requirement. The student must choose Knowledge Area courses to cover the remaining areas.

Engineering and Management

Graduation Certification Form

Name:

Other degree/major:

Communication Points:

Student Number:

Minor:

Degree Earned Hours:

Date:

Concentration/Track:

of Courses Remaining:

Year	FALL	SPRING
1 (31hrs)	EM 205 [▲] <i>Accounting</i> 3 _	EM 211 [■] <i>Enterprise Resource Planning & Mgmt</i> 3 _
	EM 120[■] <i>E&M Design I (C1)</i> 3 _	EM 121[■] <i>E&M Entrepreneurship II (C1)</i> 2 _
	MA 131 [▲] <i>Calculus I</i> 3 _	MA 132 [▲] <i>Calculus II</i> 3 _
	PH131 [▲] <i>Physics I</i> 4 _	PH132 [▲] <i>Physics II</i> 4 _
	UNIV 190[*] <i>Clarkson Seminar</i> 3 _	PY 151^{★*} <i>Psychology</i> 3 _
	FY 100 ¹ <i>First Year Seminar</i> 1 _	
2 (32hrs)	EM 350 ^{■*} <i>Micro & Engr. Econ.</i> 3 _	STAT 383 [▲] <i>Statistics</i> 3 _
	ES 220 [◊] <i>Statics</i> 3 _	University Course [•] 3 _
	MA 232 [▲] <i>Differential Eq.</i> 3 _	COMM 217 [▼] <i>Public Speaking (C2)</i> 3 _
	EM 286 [■] <i>Organizational Behavior I</i> 3 _	LW 270 [▲] <i>Law & Society I</i> 3 _
	CM 131[▲] <i>Chemistry I</i> 4 _	CM 132[▲] <i>Chemistry II</i> 4 _
3 (30hrs)	ES 330 [◊] <i>Fluid Mechanics</i> 3 _	Professional Elective [■] 3 _
	MA 231 [▲] <i>Calculus III</i> 3 _	ES 250 [◊] <i>Electrical Science</i> 3 _
	EM 333[■] <i>Operations Research</i> 3 _	FN 361 [▲] <i>Financial Management</i> 3 _
	ES 260 [◊] or ES 222 [◊] or [EE 264 [◊] (C1)] 3 _	EM 331 [■] <i>Operations Prod. Mgmt.</i> 3 _
	MK 320 [▲] <i>Principles of Marketing</i> 3 _	Knowledge Area Course [•] 3 _
4 (27hrs)	ES 340 [◊] <i>Thermodynamics</i> 3 _	ES 456[◊] <i>Integrated Process Design (C1)</i> 3 _
	EM 432 [■] <i>Organizational Policy & Strategy (C2)</i> 3 _	CUSB Elective [▲] 3 _
	Knowledge Area Course [•] 3 _	Professional Elective [■] 3 _
	Professional Elective [■] 3 _	Elective [▼] 3 _
	CUSB Elective [▲] 3 _	EC 200 [■] <i>Eng. Economics + EM/EC 150 = EM 350 if needed</i> 1 _

Courses printed above in **BOLD** are taught one semester per year.

Professional Experience Requirement

CLARKSON COMMON EXPERIENCE* (15 Hours)

Contemporary & Global Issues (CGI)

Cultures & Societies (CSO)

Economics & Organizations (EC)
EM350^{■}*

Imaginative Arts (IA)

Individual & Group Behavior (IG)
PY151^{★}*

Science, Technology, & Society (STS)

Professional Electives[■] (9 Hours)

1. _____

2. _____

3. _____

CUSB Electives[▲] (6 Hours)

1. _____

2. _____

Free Elective[▼] (3 Hours)

1. _____

Concentration/Minor/Track
Can overlap with any elective

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

Degree Requirements	
Math and Science [▲]	31
Engineering [◊]	18
Engineering Management [■]	32
Business [▲]	18
Clarkson Common Experience [*]	15
Other [▼]	6
Total Hours	120

SUBSTITUTIONS: If a student is transferring into E&M from another program, the following are approved substitutions:

CH 271=ES 340

CM 103&105=CM 131
CM 104&106=CM 132

EC/EM 150 + EC 200 = EM350

EE 221, EE 261, or EE 331=EE 264

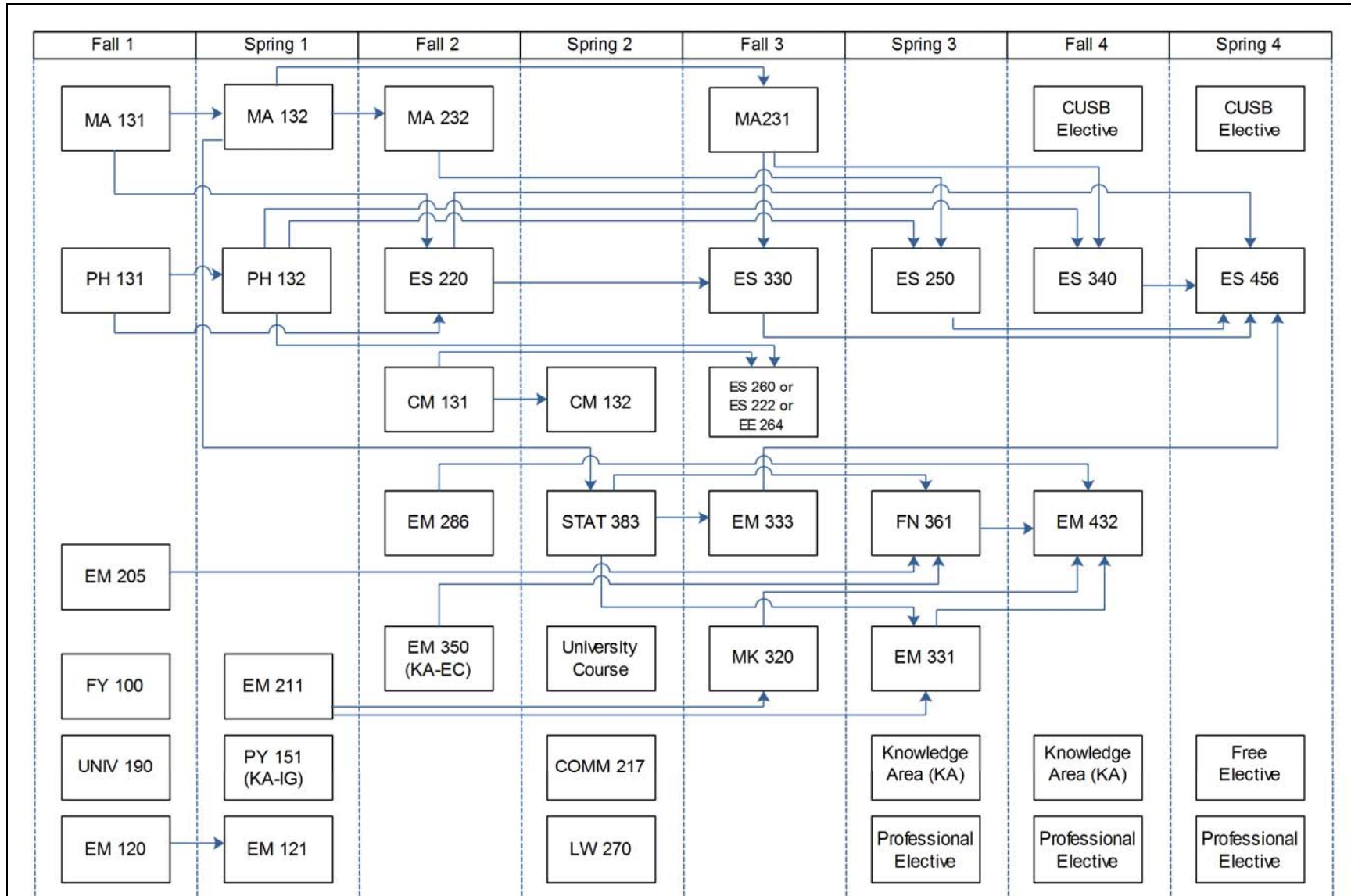
ES 100&AE 212, or ES 100& ME 212,
or ES 100&CE 212 or SB 113 & SB
114 = EM 120&121.

MA 282=MA 383

¹ FY 100 is required for first-year students only and does not count toward degree requirements.

* Also fulfills a Knowledge Area

Engineering & Management Flow Chart of Classes



Minors

To complement and enrich bachelor's degree programs, Clarkson also enables students to assemble coursework in designated programs. Identified and approved by a vote of the faculty, such minors provide students with another area of specialization outside their major. Minors require 15 or more credit hours of specified coursework. Completion of an approved minor is indicated on a student's transcript. Many minor programs are available at Clarkson University. See the Clarkson Catalog for a complete listing of minors available.

Several minors are more commonly earned by E&M students.

- Environmental Science Minor
- Law Studies Minor
- Math Minor
- Psychology Minor
- Quality-based Project Management Minor
- Sustainable Energy Systems Engineering Minor

Concentration

Global Supply Chain Management is a concentration available to E&M students.

<p>Global Supply Chain Management (Qualifies as a CUSB concentration)</p> <p><i>(Note: Because of the sequencing of these courses with the CUSB core requirements, we encourage students to work with the E&M staff beginning in the sophomore year.)</i></p> <p>Application: Procurement, Logistician, Warehouse Manager, ERP Systems Integrator, Transportation, Materials Handling</p>	<p>EM341 Global Sourcing and Supply Chain Design MK431 Supply Chain Distribution Channels IS428 Information Systems for Supply Chain Management</p> <p>Choose two of the following: EM351 Quality Management & Lean Enterprise OS466 Negotiations & Relation Mgmt. EM361 Supply Chain Environmental Management</p>
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E&M Tracks

The E&M degree is a solid foundation in math, sciences, engineering, and business. This wide range of course coverage gives newly hired professionals the flexibility and versatility to take on many different roles — problem solver, consensus builder, analyst, risk manager, decision maker, and customer manager. The degree also allows a student to keep their options open right through graduation and exploration of several career paths.

However, some students come to the program with more of a technical or managerial focus (or develop a path during the first 2-3 years of their studies) and want to take courses in a more discipline-specific manner. For these students, we offer focus areas or tracks.

Below is a brief description of these tracks. The typical courses listed for each area take the place of free electives and professional electives in the degree program. In many cases completion of a track will require a student to take more than the 120 credits required for the E&M degree.

Academic/Professional Track	Typical Courses
<p>Chemical Engineering</p> <p>Application: Manufacturing or Technical Sales positions in Pharmaceutical, Refining, Beverage Industries</p>	<p>CH250 Chemical Process Calculations CM241 Organic Chemistry I IH309 Industrial Hygiene CHXXX Chemical Engineering Elective</p>
<p>Electrical and Computer Engineering</p> <p>Application: Manufacturing or Technical Sales positions in Electronics Distribution, Computer, Utility, Semi-conductor Industries</p>	<p>EE221 Linear Circuits EE261 Intro. to Programming and Software Design Two (2) Electrical or Computer Engineering Electives</p>
<p>Mechanical/Aeronautical and Civil Engineering - Structural</p> <p>Application: Manufacturing, Project Management, or Technical Sales in Construction, Precision Machining, Aircraft</p>	<p>ES222 Strengths of Materials ES223 Rigid Body Dynamics (<i>Spring Only</i>) Two (2) Mechanical/Aeronautical or Civil Engineering Electives</p>
<p>Construction Management</p> <p>Application: Horizontal and Vertical Construction projects—estimators, assistant project managers, schedulers, expeditors, auditors</p>	<p>EM480 Project Management (CUSB Elec) ES222 Strengths of Materials IH309 Industrial Hygiene OR IH330 Safety Analysis - Environment, Health, and Safety Assessment (offered Odd Falls only)</p> <p>Two of the following: CE405 Construction Planning and Management CE406 Construction Engineering CE407 Introduction to Construction Estimating and Scheduling CE411 Construction Materials Engineering</p>
<p>Manufacturing Management</p> <p>Application: Production Supervisor, Warehouse Manager, Logistics, Transportation</p>	<p>EM351 Quality Management & Lean Enterprise ME390 Manufacturing Processes ME341 Mechanics of Machine Elements</p> <p>One of the following: EM341 Global Sourcing & Supply Chain Design MK431 Supply Chain Distribution Channels</p>
<p>Technical Marketing/Sales</p> <p>Application: Technical Sales in any Industry, Market Research, E-business</p>	<p>Four of the following: MK306 Personal Selling MK321 Consumer Behavior MK332 Marketing Research MK327 Business-to-Business Marketing MK431 Supply Chain Distribution Channels</p>

<p>Product Development</p> <p>Application: Facilitate both the technical and business intricacies of bringing new products to the global marketplace</p>	<p>ES305 Virtual Tools in Engineering Design EM480 Project Management SB305 Cost Management</p> <p>One of the following: EM351 Quality Management & Lean Enterprise ME444 Computer Aided Engineering</p>
<p>Environmental Science and Policy</p> <p>Application: Environmental Remediation, "Green" Construction, Environmental Policy Analyst</p>	<p>Two Environmental Science/Eng courses from list: CM241 Organic Chemistry I EV280 Env Science IH310 Intro to Industrial Hygiene Laboratory CE480 Chemical Fate and Transport in the Environment CE340 Intro to Env Engineering CE478 Solid Waste Management and Landfill Design CE479 Water and Wastewater Treatment Processes CE481 Hazardous Waste Management Eng.</p> <p>And Two Env. Policy courses from list: POL351 Globalization POL/SOC470 Environmental Policy PHIL370 Environmental Ethics EV428 Public Debate and the Environment: Reading and Writing Environmentally EV430 Environmental Law EV360 Environmental Economics EV480 Env. Philosophy Seminar</p>
<p>Software Engineering</p> <p>Application: Software design and technical sales</p>	<p>EE261 Intro to Programming and Software Design EE361 Fundamentals of Software Engineering EE363 Software Components and Generic Programming</p> <p>And One of the following: EE368 Software Engineering CS350 Software Design and Development</p>

BEING A STUDENT

Professionalism

One adjustment to college is to think of yourself as a student – professional; a student who will be a professional engineering manager. Like any professional position, there are certain expectations that you must fulfill. The best way to meet these expectations is to keep on top of things; do not let yourself fall behind.

Also, go to classes prepared; have all your work and reading done, and have questions ready. Participate in the discussions, practice the problems the professors assign, and push yourself to do your best. Make the best of every opportunity presented to you. You are building the base for your professional career; build a strong base.

The professors may not always cover in class everything you need to know, so study beyond the lecture. You will find that the professors are more like guides, and you have to be both the teacher as well as the student more than you had to in high school. That is not saying they do not want to help or teach; they are just forcing you to take a stronger part in your education. They are preparing you for the professional world, where there are no obvious teachers. For you to compete successfully with your peers once you enter the work-force, you need to achieve a basic level of competence in many areas. Many courses build upon other courses to achieve this basic level. Therefore, it is essential that certain topics are covered in courses to ensure your ability to compete successfully. By completing the required courses in the Schools of Business and Engineering, you will obtain a strong background for your chosen area of study. Through the selection of elective courses, backgrounds in more specific areas of Business and Engineering (i.e., a minor, concentration or track) can be obtained.

Near the end of each semester your professors will give you a “course evaluation form” to fill out. Your constructive comments regarding the course and the professor are taken seriously. Each professor’s salary increases, tenure, and promotion are influenced by the information on the course evaluation forms.

In addition to your evaluations, there is constant peer review of faculty in our School. The review consists of evaluations by other faculty who sit in on classes to evaluate the teaching abilities of the faculty member under review. Reports from these reviews are used as a basis to improve teaching performance, if necessary.

Code of Ethics

Clarkson values personal integrity. Matriculation at Clarkson carries with it the obligation that a student will not claim as his or her own, the work of another, or any work that has not been honestly performed, will not take any examination by improper means, and will not aid and abet another in any dishonesty.

Violations of the Code of Ethics are regarded as most serious offenses and render the offenders liable to severe disciplinary action. Alleged violations of the Code of Ethics are dealt with according to the section of the Academic Integrity Committee found in “Clarkson’s Regulations.”

Academic Integrity at the Clarkson School of Business
Adopted by Faculty: November 14, 2008

I. Purpose

This document is the policy on academic integrity and plagiarism for students in the Clarkson University School of Business. This policy is intended to reinforce, but not supersede, specific policies laid out in course syllabi. In areas where course syllabi are silent, this policy will apply.

II. Zero Tolerance of Academic Integrity Violations

Clarkson University has always held integrity and ethical behavior as core values¹. As students and faculty at Clarkson, we are bound to these values². As business managers and leaders, we are stewards for the shareholders, employees and customers of the firms we manage - there is no room for lapses in ethics or integrity. The Clarkson University School of Business embraces the University's policy on Academic Integrity and is committed to zero tolerance of Academic Integrity violations or even the appearance of such violations. Violations of Academic Integrity, by ourselves or by our colleagues, must not and will not be tolerated.

The Clarkson University Regulations for 2007-08, Section IV-A³ state:

“IV-A CODE OF ETHICS

Clarkson values personal integrity. Matriculation at Clarkson carries with it the obligation that a student will not claim as his or her own, the work of another, or any work that has not been honestly performed, will not take any examination by improper means, and will not aid and abet another in any dishonesty.

Violations of the Code of Ethics are regarded as most serious offenses and render the offenders liable to severe disciplinary action. Alleged violations of the Code of Ethics are dealt with according to the section on the Academic Integrity Committee.”

(http://web2.clarkson.edu/studentaffairs/regulations/regulations_2007-08.pdf, p18)

If there is any doubt about whether an action violates the Business School's rules on Academic Integrity, it must be assumed the action does.

III. Plagiarism

The Merriam-Webster Online Dictionary⁴ defines “plagiarize” as:

“plagiarize

1. to steal and pass off (the ideas or words of another) as one's own : use (another's production) without crediting the source
2. to commit literary theft : present as new and original an idea or product derived from an existing source” (<http://www.merriam-webster.com/dictionary/plagiarizing>)

In practice, many faculty and students have difficulty determining whether a particular case constitutes plagiarism. For example, what does “crediting the source” mean in definition (1) above? Furthermore, many people assume that plagiarism implies intent *but this is not so*. Fundamentally, plagiarism is any failure to give credit where credit is due. Unintentional plagiarism is common but is just as serious an offence as intentional plagiarism.

¹ *Clarkson University: Code of Business Conduct*, “Preamble”, <http://www.clarkson.edu/finance/conduct.html>

² *Ibid.*

³ *Clarkson University Regulations for 2007-08*, “Section IV-A Code of Ethics”, p18, http://web2.clarkson.edu/studentaffairs/regulations/regulations_2007-08.pdf

⁴ <http://www.merriam-webster.com/dictionary/>
2009-2010

The web site Plagiarism.org has an extensive discussion of plagiarism and how to avoid it. Among the examples of plagiarism the site offers are the following:

“All of the following are considered plagiarism:

- turning in someone else's work as your own
- copying words or ideas from someone else without giving credit
- failing to put a quotation in quotation marks
- giving incorrect information about the source of a quotation
- changing words but copying the sentence structure of a source without giving credit
- copying so many words or ideas from a source that it makes up the majority of your work, whether you give credit or not (see our section on "fair use" rules)

Most cases of plagiarism can be avoided, however, by citing sources. Simply acknowledging that certain material has been borrowed, and providing your audience with the information necessary to find that source, is usually enough to prevent plagiarism.” (http://www.plagiarism.org/learning_center/what_is_plagiarism.html)

To avoid ambiguity, all citations must adhere to the following rules (taken from *The Publication Manual of the American Psychological Association (5th ed.)* as summarized by Professor Sandra Fisher⁵). **Any other form of citation is insufficient and will be considered plagiarism.**

Citing Sources and Quotations in APA Format

The Publication Manual of the American Psychological Association (5th ed.) is the definitive source on how to appropriately cite sources in the format required for any course. Below are some examples of both in-text citations and reference list entries using the format specified by the APA.

In-text Citations

To cite a source that you have paraphrased, list the author and the year:

Example #1: Fisher (2008) discussed the importance of appropriately acknowledging sources used in preparing a client deliverable.

Example #2: Including expert sources in your deliverable can enhance the perceived credibility of that deliverable (Fisher, 2008).

For a quotation, you must use one of two formats:

a) for shorter quotations, work it into the text, setting the quoted material off in quotation marks:

Example #1: As described by Stroh and Johnson (2006), “This is a very good time indeed for consultants” (p. 1).

Example #2: We are using this text for the course because “this book is about what consultants do and how they do it” (Stroh & Johnson, 2006, p. 1).

b) longer quotations (40 words or more) should be set apart by in an indented block (indented 1/2 inch on each side) and preceded by an in-text citation. In this case, no quotation marks are used.

⁵ See Appendix A of Professor Sandra Fisher’s SB411/611 Course Syllabus, Fall 2008
2009-2010

Example: As noted by Stroh and Johnson (2006, p. 1):

This is a very good time indeed for consultants. As corporations have been reorganizing and downsizing, merging and globalizing, the consulting business has been booming. During the 1990s, U.S. revenue from consulting increased by at least 10% each year and by as much as 20% to 30% in some of the larger firms.

Note that all in-text citations must be accompanied by a full citation in the Reference List. A full citation must allow the reader to quickly and easily find the exact text you are referring to. In cases where a certain author or authors have written more than one cited work in a particular year, the year should be followed by a letter to differentiate the citations.

Example: Fisher (2008a) discussed the importance of appropriately acknowledging sources used in preparing a client deliverable stating that “including expert sources in your deliverable can enhance the perceived credibility of that deliverable” (Fisher, 2008b).

Reference Lists containing complete citations must be placed at the end of a document.

Building the Reference List

Journal Articles

Wang, T.G., & Chen, J.H.F. (2006). Effects of internal support and consultant quality on the consulting process and ERP system quality. *Decision Support Systems*, 42, 1029-1041.

Books

Stroh, L.K., & Johnson, H.H. (2006). *The Basic Principles of Effective Consulting*. Mahwah, NJ: Lawrence Erlbaum Associates. ISBN 0-8058-5420-7

Websites

Scheuren, F. (2004). What is a survey? (2nd edition). National Opinion Research Center. Retrieved from www.whatisasurvey.info on July 24, 2007.

If in doubt about correct style or if a particular source is not defined here, you must consult your professor for appropriate citation styles *before* handing in any work.

IV. Draft Documents Must Also Use Proper Citation

Draft documents are typically prepared for the review of others. Although readers of a draft usually understand that it is a work in progress, there is no question that the draft represents the thoughts and ideas of the author(s), albeit probably still in the early stages of development. Drafts, when circulated outside the sphere of the draft authors, must clearly identify and attribute the work and ideas of others – draft documents require proper citation just as final documents do.

V. Consequences of Academic Integrity Violations

Section IV-A of the Clarkson University Regulations for 2007-08 states, “Violations of the Code of Ethics are regarded as most serious offenses”. Penalties are set by the professor or School with a mark of zero on the assignment, test or paper being the typical sanction for a first Academic Integrity violation (this can result in course failure if the violation is on a final exam). A second violation in the same course almost always results in automatic failure of the course.

When a student is accused of a second offense in the same course, the professor is *required* to make a recommendation to the University Academic Integrity Committee stipulating: no additional action (beyond penalties already levied); Academic Suspension; or Academic Expulsion. In the School of Business, the recommendation is almost always one of the latter two. If the Academic Integrity Committee feels suspension or expulsion is merited, a recommendation will be made to the University President. Only the President (or his or her designate) has the authority to impose a suspension or an expulsion.

Academic Suspension means that a person may not earn academic credit at Clarkson University for any work done at any institution during the duration of the Academic Suspension. Thus, courses taken at another university during the suspension may count at that other institution but they can never be applied toward programs at Clarkson. An Academic Suspension delays the earning of a degree or diploma from Clarkson University by, at least, the length of the suspension. Academic Suspensions are usually for a period measured in academic terms (for example, for three academic terms).

Academic Expulsion means that a person may never again earn credit at Clarkson University.

VI. Rights When Accused of an Academic Integrity Violation

When accused of an Academic Integrity violation, the student has the right to appeal to the University Academic Integrity Committee. The accused may appeal the accusation, the penalty levied or both, at their choice. To appeal, simply notify the Chair of the University Academic Integrity Committee in writing.

If anyone has questions about the process, the consequences, or any other issues relating to Academic Integrity, they are encouraged to speak with the Chair of the Academic Integrity Committee. The Dean of Students’ Office or the Dean’s Office for any of the University’s Schools can supply the name of the current Chair of the Academic Integrity Committee.

ADVISING

Your academic advisors for your studies in E&M are:

Misty Spriggs, BH Snell 119, mspriggs@clarkson.edu, 315-268-6579

Adrienne Boswell, BH Snell 103, aboswell@clarkson.edu, 315-268-2144

**In addition, academic advising assistance can be obtained from the E&M Program Director:
Dr. Amy K. Zander, BH Snell 101, zander@clarkson.edu, 315-268-3849

Advisor – Student Relationship

You may visit with your academic advisor at any time. Be sure to e-mail or call ahead for an appointment, so they can be prepared for your meeting.

What is the Advisor's Responsibility?

Your advisor is here to help you. Help may include career advice, help in choosing courses, or assistance dealing with personal difficulties. Your advisor will meet with you during course selection week. The advisor prepares for these meetings by knowing the curricular requirements. That means knowing substitute courses, course options available, and the best courses for certain areas of interest. Finally, the advisor must know you, the student. Knowing your goals and interests will help her to suggest courses that suit you and your academic interests. After discussing your courses your advisor will sign your course selection form.

What is the Student's Responsibility?

Completion of the necessary requirements for the degree falls to the student. You are also responsible for knowing and completing all graduation requirements for the program. You are responsible for registering for courses each semester and attending and completing the coursework.

It is your responsibility to seek assistance whenever you are unsure or uncertain about the answer(s) to any questions you may have concerning your academics. Always do this in a timely fashion so as to not jeopardize your academic standing and to meet any required deadline

Be sure to seek help when you need it. There are a number of places to go for assistance.

Academic Help

Professor
Advisor
Academic Support Center
Teaching Assistant
Help Sessions

Personal/Social Help

Peer Counselor or R.A.
Student Development Center
Advisor
Student Life Office

CLARKSON SERVICES

Clarkson has a number of services for those seeking academic or personal help. These include:

Student Administrative Services Center (SAS)

The Student Administrative Services Center (SAS) combines the activities of the Bursar's, Registrar's, and Financial Assistance Offices and is located in the central area of Cuble-Reynolds and Ross-Brooks dormitory. **This office can be contacted at 268-6451.**

Each student is assigned to one SAS representative based on the student's last name. Therefore, students have one person to whom they can turn for most of their administrative needs. If there is a need to contact SAS, students and their parents should ask to speak with their student services representatives.

If your last name

begins with the following ...

A - Ck

Cl - Gh

Gi - K

L - Nf

Ng - Sl

Sm - Z

ask for or send e-mail to:

Mary Jones

ionesm@clarkson.edu

Gerri Snyder

snyderg@clarkson.edu

Tina Martin

martint@clarkson.edu

Barbara Russell

russellb@clarkson.edu

Stacey Hawkins

shawkins@clarkson.edu

Diane Stone

stonedm@clarkson.edu

Clarkson Counseling Services

Clarkson Counseling Services assists students in reaching their full potential for social and emotional development. Counseling is a proactive way to manage difficulties, gain perspective and take responsibility for your emotional welfare. Students seek counseling for a variety of reasons, including, but not limited to: relationship issues; adjustment to change; loss and bereavement; sexual assault or harassment; body image and eating disorders; depression; anxiety; sexuality; self esteem; alcohol or drug abuse; etc. The counselor-student relationship provides a unique and confidential opportunity to explore important issues and identify resources that will lead to personal growth. For more information or to schedule an appointment, call 268-2327 or go to www.clarkson.edu/counseling.

The Student Success Center (SSC)

The Student Success Center is designed to support all students in a proactive and supportive environment by providing structured and effective services as they persist towards their undergraduate degree. The SSC incorporates three offices: First-Year Advising and University Studies, Office of Accommodative Services and Trio's-Student Support Services. Using a collaborative approach within and across the campus community, the SSC offers all students access to academic counseling and advisement, as well as tutoring and disability services. The SSC can be found on the first floor of the ERC. For more information or to schedule an appointment, call 268-2209.

First-Year Advising: It is not unusual for students to experience many changes in their first year on campus, and we provide resources to help them. Academic advising is an important function of Clarkson's faculty and staff. Although all students have a faculty or professional administrative advisor within their academic programs of study, an added service offered by Clarkson is First-Year Advising for students who want extra guidance. Many students want to tailor their education to pursue multiple interests, or they are still deciding on a major or career direction.

The Office of Accommodative Services (OAS) assures access to the University and its programs for students with documented disabilities, in accordance with Federal Law, specifically the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990. OAS determines, coordinates and provides reasonable accommodations, educates and advocates for an accessible and hospitable learning environment, and promotes responsibility and self-advocacy on the part of the individuals we serve. Partnered with Clarkson's ADA Committee, OAS extends this mission by creating a campus environment where all persons are viewed on the basis of ability.

Student Support Services (SSS) is a federally funded Trio program designed to maximize the academic performance of Clarkson University students who are first generation, from low income background or who have a disability. SSS provides opportunities for academic development assists students with basic college requirements, and serves to motivate students toward the successful completion of their post-secondary education. The SSS program may also provide grant aid to current students. Student services include study skills development, tutoring, financial literacy, mentoring and financial assistance.

International Student Advising

International Student Advising is available in BH Snell Hall 107. The service includes orientation and special advising concerning such topics as: visa status requirements, and work regulations, for example. For further information on this service or appointments call 268-7970.

Extracurricular Activities

Potsdam offers many extracurricular activities. The Associated Colleges of the St. Lawrence Valley publishes a calendar of "Special Events" every month.

Guidelines for Completing Courses at Other Colleges/Universities

Where to Start?

Students interested in taking courses at another college/university must first consider **where** the course(s) will be taken, **how many** courses will be taken, and **what** classes they want to take. Once these items are addressed students have clear guidelines to follow.

Cross-Registration within the Associated Colleges of St. Lawrence Valley:

Cross-registering gives students an opportunity to expand the depth and variety of their academic program. Full-time Clarkson students interested in taking courses at SUNY Potsdam, SUNY Canton or St. Lawrence University can cross-register for up to 2 courses in an academic year (including summer) **as part of Clarkson's normal tuition**. Clarkson considers full-time to be a minimum of 12 credit hours in the fall/spring semesters and 6 credit hours any one summer session. Students can register for up to 19 credits without being charged additional tuition charges.

If you are interested in cross-registering, first check with your advisor to ensure that the class you have selected will count towards your academic program. You must then seek the permission of the professor teaching the course at the other institution. You can do this via e-mail, phone or visit. You must complete a cross-registration form which will require the professor's signature (an e-mail verification will suffice as a signature) and that of your advisors. Once your paperwork has been filed with SAS, your class will be registered as though you are taking a Clarkson course. The grade from cross-registered courses from the Associated Colleges of the St. Lawrence Valley does transfer and will become part of your GPA calculation.

For complete Cross-Registration Regulations and application forms visit the Associated Colleges website at: <http://www.associatedcolleges.org/services/crossregistration.htm>

Off-Campus Permission Form:

Students studying abroad or those interested in taking courses on a part-time basis at another campus other than the Associated Colleges can do so by completing an Off-Campus Permission form. You can download this form from:

<http://www.clarkson.edu/sas/forms/off-campusform.pdf>

Off-Campus Permission forms are available from the link above and in most academic offices. Students complete sections 1, 2 and 3, and should sign their name in section 5. One form must be completed for each course a student is taking off campus and a course description from the chosen school's catalog or website must be attached.

Students taking a Business Course off-campus must have the course approved by the Associate Dean of Business. Drop the form off with your advisor for this approval. Students taking a non-business course must have their form approved by the Clarkson department that offers a similar course (i.e. a statistics course must be approved by Clarkson's Math & Computer Science Department). This is necessary to ensure courses are equivalent in level/rigor to those offered by Clarkson. Once approved by the appropriate department, the form is brought to the student's academic advisor.

It is the student's responsibility to request an official transcript from the school attended and to confirm its receipt in SAS. Upon receipt, SAS will post transfer credit hours to a student's record for any course passed with a grade equivalent to Clarkson's "C" grade or higher.

However, SAS will record a grade of "T" to indicate that the course was taken at another academic institution and, therefore, the course will not be used in computing the student's GPA. To clarify, no letter grades will be transferred or appear anywhere in Clarkson's records.

CUSB Transfer Credit Criteria:

Clarkson's School of Business has specific criteria it uses to determine what transfer credit will be accepted. Please review the following list with your advisor before completing any Off-Campus Permission forms or enrolling in any courses off-campus.

Business courses at the 100 or 200 levels will be accepted from nearly any 2 or 4 year college or university.

To receive transfer credit for EM/AC205 - Introduction to Accounting for Decision Analysis, an equivalent course must be a blend of both Financial and Managerial Accounting. At many schools this requires two separate courses (Financial Accounting and Managerial Accounting).

Business courses at the 300 level or higher must be taken at a 4-year institution accredited by The Association to Advance Collegiate Schools of Business (AACSB). To obtain a listing of accredited schools visit the AACSB website:

<http://www.aacsb.edu/accreditation/accreditedmembers.asp>.

Individual courses for which there are no Clarkson equivalents will be evaluated on a case by case basis. If accepted, the course will appear on a student's transcript with either 001 or 002 after the course designator (ex. AC001).

001 identifies that no comparable class existed, but this could be used as a free elective in E&M

002 identifies that no comparable class existed, but the course satisfies a curriculum requirement

Any other questions regarding transferring credit should be directed to your advisor.

Forms and Procedures (From the Perspective of the Student):

Off Campus Forms

- Student must obtain a course description from the off-campus university
- Take off-campus form and copy of course description to chair of department of that course:

Business	Katherine Wears (or through your advisor)	Snell 327
Engineering	Clarkson Course Instructor	
Humanities & Soc. Sciences	Dr. Bill Vitek	Snell 271
Physics	Dr. David Wick	Science Center 251
Chemistry	Dr. Jim Peploski	Science Center 223
Math	Dr. Chris Lynch	Science Center 355
Psychology	Dr. Bob Dowman	Science Center 173

- See Misty Spriggs, Adrienne Boswell or Dr. Zander with a signed form and course description

Study Abroad Exchange

- Student must go to the Study Abroad Exchange office and see Barbara Brown-Shor (ERC 154) FIRST.
- Get course descriptions for the classes you will take at the university while abroad and complete off-campus permission forms for each
- Have forms signed by Ms. Brown-Shor
- Bring forms to Misty Spriggs or Adrienne Boswell for signature
- Take forms back to Study Abroad Exchange office

Co-op

- See Barbara Brown-Shor in the Co-op/International Exchange office (ERC 154)
- Bring paperwork to Misty Spriggs or Adrienne Boswell for assistance in course planning
- Take paperwork to SAS representative for signature
- Then return all paperwork to Co-op office

Minor

- Student must take form to chair/director of program in which they wish to minor

Environmental Science	Alan Rossner	Science Center 157
Law Studies	Katherine Wears	B.H. Snell 327
Math	Dr. Chris Lynch	Science Center 355
Psychology	Dr. Bob Dowman	Science Center 173
Quality-based Project Management	Katherine Wears	B.H. Snell 327
Sustainable Energy Systems Engineering	John Moosbrugger	CAMP 102

- Get copy of courses required to fulfill minor
- Bring paperwork back to Misty Spriggs or Adrienne Boswell for signatures

Cross Registration

- Take cross registration form to 1st day of class, or directly to professor to obtain permission and signature
- If the course is to replace a required course in your program, also complete an off-campus permission form
- Bring form to Misty Spriggs or Adrienne Boswell (no course description required)

Drop/Add

- Fill out top of form, and course information
- See instructor or department chair of the course
- Bring form to Misty Spriggs or Adrienne Boswell for signature

Degree Information

Double Majors/Dual Degrees/Second Degrees

1. A single Clarkson bachelor's degree with a double major is awarded when the student satisfies all curricular requirements for two bachelor's degree programs but does not qualify for a second degree or dual degree. A double major degree requires completion of all requirements for both programs prior to graduation.
2. A dual degree (that is, the simultaneous awarding of two Clarkson bachelor's degrees) is noted on a student's transcript when the student:
 - a. satisfies all degree requirements for at least two different Clarkson bachelor's degree programs,
 - b. has a minimum of 150 credit hours, including at least 30 credit hours unique to each program, and
 - c. the relevant academic deans, in consultation with the department heads or directors of the degree programs, judge the two degree programs to establish competencies in two essentially different areas.
3. A second bachelor's degree (that is, the non-simultaneous awarding of two Clarkson bachelor's degrees) is awarded when the student:
 - a. applies for readmission as a second degree candidate by sending a letter requesting readmission to the Student Administrative Service Center,
 - b. has a minimum of 150 credit hours, including at least 30 credit hours unique to each program,
 - c. has a minimum of 12 credit hours in residence after the semester in which all requirements of the first degree program were satisfied, with at least 6 credit hours of this work consisting of upper-division courses in the second degree program, and
 - d. receives the two degrees at two different commencements, with the portion of the work completed in residence after the awarding of the first degree.

Within 6 Hours

Students within 6 credit hours of meeting all graduation requirements may participate in commencement, and may finish course work off-campus. However, the off-campus permission forms must be completed and approved by the E&M Director.

Classification of Students

- A student must complete at least 24 credit hours for Sophomore status.
- A student must complete at least 54 credit hours for Junior status.
- A student must complete at least 84 credit hours for Senior status.

Advanced Placement/Transfer Credit

Advanced Placement or transfer credit can be granted to you. For further information and to get the credit applied to your transcript you need to contact a representative in the Student Administrative Services Center (SAS). It is best to do this as soon as possible in your first year.

Transfer credit from another college or university is also handled through the SAS Office. Before taking a course at another university, the Off-campus Course Work Permission form must be filled out.

CAREER CENTER

<http://www.clarkson.edu/career/>

Inventory your interests and build a career that you enjoy. Talking to your faculty mentor or advisor is a good way to see what is out in the work world. Many faculty have held industrial positions before entering teaching, or are working for industry or government as a consultant or researcher. If you are undecided about what major to choose, stop by the Career Center and inquire about their career tests. These will help you inventory your interests and choose a career path.

Make contact with the staff of the Career Center in the ERC during your first semester at Clarkson to find out what they can do for you. Also, attend the Career Fairs held at Clarkson each fall and spring semesters. Many company representatives and alumni attend the Clarkson Fairs. It is a great opportunity to learn about the opportunities available. You can inquire about internship and Co-op positions.

Clarkson offers programs to broaden your college experiences. Both the Cooperative Education and International Exchange Programs require a student to be off campus for at least one semester. Participation in either of these programs requires that you have at least a 2.5 cumulative GPA for the Co-op Program and a 3.0 for the International Exchange Program(s). Be certain to research curriculum requirements and speak to your advisor so that you can plan when a co-op or international exchange experience will best fit your schedule.

Cooperative Education Program (Co-op)

The Cooperative Education is a good way to get practical experience by working for a company for one semester (and possibly the summer months). To find out more about this program contact the Co-op Office located in the Career Center of the ERC Building. Please take note that written approval from E&M is required before a student leaves on Co-op.

International Exchange Program (Study Abroad)

Some students, usually in their junior year, participate in exchange programs that Clarkson has with universities in Australia, Sweden, England, Italy, France, Austria, New Zealand, Mexico, Germany, Hong Kong, Korea and Spain. To find out more details, contact the Career Center. The total number of credits transferred to Clarkson will not exceed 15. Students are expected to apply for international exchange through the Career Center during their sophomore year with the expectation to study abroad during their junior year. Prior to departure, an Off-Campus Course Work Permission form must be completed and approved for each course. In addition, “*Good Standing*” status is a requirement. For more information, visit the international exchange website at: http://www.clarkson.edu/career/study_exchange/index.html

Resume, Internship and Job Search

The Career Center staff is very helpful and qualified to assist you with writing and designing your resume. It is wise to stop by early on in your college career to find out how to begin building the credentials for your resume. The Career Center can also help you with strategies and contacts for finding internships, co-ops and jobs. Their office also conducts mock interviews upon request.

Companies That Have Hired E&M Majors In Recent Years

ABB Services
Accenture
Action Automation
Active Industries
Advance Testing
Advanced Pneumatics
ALCOA
American Infrastructure
American Power Conversion
Amphenol
Apple Computers
Applied Industrial Tech.
Arrow Electronics
AVNET
Bath Iron Works
Bausch & Lomb
Borg Warner
Brooker Engineering
Burt Process Equipment
UTC (Carrier, Pratt & Whitney, Otis)
Chemung Contracting
Cives Steel
Cooper Industries
Corning, Inc.
Cooper-Crouse Hinds
Cutler-Hammer
Danaher Tool Group
Danfoss
Draper & Associates
Dresser-Rand
Emerson Power Transmission
Energizer
Ernst & Young
Eveready
Exxon Mobile
Fastenal
Frito-Lay
Future Electronics
General Dynamics
General Electric (multiple business units)
Goodyear
Goulds Pumps Inc.
Grace Performance Chemicals
Graham Manufacturing
Grainger
Grinnell
HADCO
Harris Corp
Hippotronics
Honeywell, Inc.
Hubbell
IBM
Ingersoll-Rand Co.
ITT
Johnson Controls Inc.
Johnson & Johnson
Kaman Industrial Tech.
Kiewit Construction
Kodak Group
LaCorte
Lockheed Martin Corp.
Lutron
Makino
Malcolm Pirnie, Inc.
Manhattan Associates
MATCO Electronics
MetLife
Mitten Fluidpower
MWH Americas
Newark-in-One
Norfolk Naval Shipyard
Northwestern Mutual Life
NY Air Brake
Nyrock Machine Tool
O'Brien & Gere
Otis Elevator
Pacific Scientific
Panduit
Parametric Tech.
Parker-Hannifin
Phillip Morris
Portsmouth Naval Shipyard
Price Waterhouse
Proctor & Gamble
Ralph W. Earl
Raymond Corporation
Robson-Woese
Rockwell Automation
Sager Electronics
Saint Gobain-Norton Abrasives
Sensata Technologies
Siemens Building Technologies
ST Microelectronics
TAC Americas
TECO Westinghouse
Torrington Corporation
Trane
TTI
Tyco Industries
United McGill
US Army Corps of Eng.
US Navy
US Patent & Trademark Office
WW Grainger Industrial Supply
Welch Allyn
Whiting-Turner Construction
Wyeth Ayerst

SOCIETIES AND ACTIVITIES

Activities

Students take an active interest in their environment and have traditionally sought leadership positions throughout the campus community. The student directory, newspaper (the Integrator), and the Activity Fair can give you a complete picture of what activities are available.

E&M Society

- The E&M Society is open to all students.
- The E&M Society brings speakers, typically Alumni, on campus to discuss careers open to graduates. These meetings are excellent opportunities to gain insight into the type of career you may be interested in.
- Notices of upcoming meetings are emailed to all E&M students. Watch for them.

Sigma Tau Iota

- Sigma Tau Iota is the Program Honorary Society. It is dedicated to serving and strengthening the growth and goals of the Program.
- The Society is open to junior and senior students in the top 15% of their class, and who have been in the program for two semesters or more.
- Induction ceremonies are held once each year.

Awards and Scholarships

The Engineering and Management Program honors several deserving students each year with the following awards:

Extracurricular Activity Award
Joseph Scaturro Endowed Scholarship
Charles T. Mosier '72 Memorial Scholarship
Richard Brady '82 Legro Memorial Endowed Award

REFERENCES

Clarkson Undergraduate/Graduate Catalog –
http://www.clarkson.edu/catalog/documents/2008_09_catalog.pdf

Clarkson University Regulations – Contains academic and social regulations and the official policy statements of the University. You should be familiar with this pamphlet. The Dean of Student's Office maintains responsibility for University regulations. Any questions should be directed there.
<http://www.clarkson.edu/studentaffairs/regulations>

Register of Courses – Contains links for each semester where you can find titles and descriptions of current courses available at Clarkson. <http://www.clarkson.edu/sas/master/>