

BOARD OF HIGHER EDUCATION
REQUEST FOR COMMITTEE AND BOARD ACTION

COMMITTEE: Assessment and Accountability

NO.: AAC 10-20

COMMITTEE DATE: April 27, 2010

BOARD DATE: May 4, 2010

WENTWORTH INSTITUTE OF TECHNOLOGY
MASTER OF SCIENCE IN CONSTRUCTION MANAGEMENT

MOVED: The Board of Higher Education hereby approves the Articles of Amendment of **Wentworth Institute of Technology** to award the **Master of Science in Construction Management**.

Authority: Massachusetts General Laws Chapter 69, Section 30 et seq.

Contact: Dr. Francesca B. Purcell, Associate Commissioner for Academic and P-16 Policy

BOARD OF HIGHER EDUCATION

May 2010

Wentworth Institute of Technology

Master of Science in Construction Management

INTENT

In October 2009, Wentworth Institute of Technology filed a petition with the Department of Higher Education to seek approval to award the Master of Science in Construction Management degree (MSCM). The proposed program is designed to provide graduates with the knowledge and skills needed to function successfully in middle- and upper-level construction management positions such as general contractors, real-estate developers, and sub-contractors in construction management and architectural/engineering firms. Additionally, the proposed program is designed to allow students to pursue advanced study and subsequent teaching opportunities.

Wentworth has offered construction-oriented programs since 1911. The proposed program seeks to build upon the strength of the current undergraduate construction management program, which enrolls over 500 students and has approximately 30 companies and individuals that serve on its Industry Professionals Advisory Committee, ensuring its relevance and responsiveness to workforce needs. A spring 2007 accreditation review of the current undergraduate program by the American Council for Construction Education recognized the strength of the current CM program and granted a six-year reaccreditation status.

The proposal for this graduate professional degree program in construction management is directly related to Wentworth's strategic plan which includes the goal to "develop new programs and expand upon current programs to ensure that Wentworth offers its undergraduate, graduate, and professional studies students the best possible learning opportunities." If approved, the MSCM would be the second master's program offered at Wentworth, joining the Master of Architecture that was approved by the Board of Higher Education in 2008.

INSTITUTIONAL OVERVIEW

Wentworth Institute of Technology, located in Boston, Massachusetts, is a private coeducational institution of higher education offering bachelor's degrees in 15 majors, including architecture, computer science, construction management, engineering, engineering technology, interior and industrial design, and management. The Institute was founded in 1904 through a bequest from Arioeh Wentworth, a Boston merchant. From its beginnings in 1911, Wentworth has offered both day and evening programs of study. Initially, these were primarily one-year apprentice courses for skilled workmen and two-year courses for those seeking additional practical experience in preparation for roles as master mechanics and foremen. Courses of instruction included all of the primary building construction and engineering trades.

Since 1911, Wentworth's charter has been amended several times, reflecting the evolution of its mission and educational goals. In 1956, the Commonwealth of Massachusetts granted Wentworth Institute the power to award the Associate in Engineering and in 1968 the Institute received authority to grant the Associate in Applied Science. In 1970, Wentworth College of

Technology was chartered to grant the Bachelor of Science and Bachelor of Engineering Technology. In 1977, Wentworth Institute and Wentworth College were merged into Wentworth Institute of Technology with the surviving corporation authorized to offer the Bachelor of Science in Engineering Technology, Bachelor of Engineering Technology, Associate in Engineering and Applied Science, and appropriate honorary degrees. In 1984, the Institute was empowered to “grant degrees at the associate and baccalaureate level in fields of science, engineering and technology” and to “confer appropriate honorary doctorate and ex officio degrees.” In its most recent approval in 2008, the Board of Higher Education approved the institution’s request to award the Master of Architecture.

ACADEMIC AND RELATED MATTERS

Curriculum (Attachment A)

The primary educational objective of this program is to educate students in foundational management principles and construction education and to allow those who want to pursue an advanced terminal degree the opportunity to do so. Students must complete a minimum of 10 courses (30 credits) and may also choose to complete a 2-course (6 credits) thesis option. To fully integrate both academic and practical learning, each course will utilize both industry professionals as well as academic experts. This will be cohort-based, part-time program that can be completed in less than two years.

Student Learning Outcomes

Educational objectives will be linked to theory and practice to create real world applications and value, introduce new software and technology, improve management skills through research and application of best practices, and serve the needs of the construction industry to produce highly desirable managers and executives. Specifically, all Wentworth Master of Science in Construction Management graduates will:

- Understand the issues related to advanced business management theories.
- Demonstrate an understanding of strategic management.
- Demonstrate leadership qualities.
- Understand the development of teams and human resource issues.
- Understand the significance of international construction.
- Understand the implications and applications of evolving construction technologies.
- Demonstrate executive level decision making and critical thinking.

Data will periodically be collected, measured and evaluated in relation to the program’s goals and objectives. The assessment process will be spearheaded by the department head for Civil, Construction and Environment in concert with the MSCM program director and faculty.

Admission

Students applying to the proposed MSCM program are expected to meet the following program prerequisites to be considered for admission:

1. A completed bachelor’s degree in an ACCE accredited program in Construction Management, or a bachelor’s degree with demonstrated competencies in:
 - Accounting
 - Construction Estimating
 - Construction Scheduling

- Project Management
 - General Management
2. An overall undergraduate grade point average of 3.00 on a 4.00 scale.
 3. Completion and submission of results from the GRE or GMAT exams.
 4. At least 1 year of verifiable experience in the construction industry.
 5. At least two letters of recommendation from supervisors.

Projected Enrollments/Graduation Rates

Wentworth anticipates an initial cohort class of 10 students based on alumni surveys. It is expected that there will be approximately 15 students/year that will graduate, assuming a 20% attrition rate.

	# of Students Year 1	# of Students Year 2	# of Students Year 3	# of Students Year 4
New Full Time	0	0	0	0
Continuing Full Time	0	0	0	0
New Part Time	10	15	18	20
Continuing Part Time	0	8	12	15
Totals	10	23	30	35

RESOURCES

Faculty and Administration

A Program Director will be added in summer of 2010, and one full-time faculty will be added in summer of 2011. Part-time faculty allocations will be used to compensate industry professionals that will work with the academic faculty to create a unique model of academic/industry learning. A new administrative assistant position will be added to support the new program as well through The Arioeh Center @ Wentworth which is responsible for all professional and continuing education programs. The Arioeh Center, Institutional Admissions Office, and Student Services will provide support for recruitment, admissions, marketing, faculty compensation, student registration/progress, graduation audits, and fee collection.

Library and Information Technology

The Library (Alumni Library) of Wentworth Institute of Technology exists for the support of the curricular activities of the Institute, supporting both departmental missions and individual courses. The Library is housed on two levels in Beatty Hall, which is located in the center of the campus and is open seven days a week, 85 hours per week (longer during finals). At all times a professional reference librarian is available. The following table list holdings related to the MSCM program:

	Books	Periodicals
Construction	3,529	45
Architecture and Engineering	27,000	99
Business and Management	5,423	13
Total Institutional Library	67,037	478

As part of the consortium Fenway Libraries Online (FLO), Wentworth has access to the New England Library Information Network (NELINET), a regional member of OCLC, an international bibliographic service which is shared by about 60,000 libraries in 96 countries around the world, and a member of the cataloguing services of the Library of Congress.

The Library Task Force for Graduate Curriculum will assess and recommend necessary improvements to the current library collections and information technology resources in support of graduate research. Wentworth supports this initiative and is aware of the financial implications of upgrading the collections and digital resources to meet the needs of masters programs and has included \$20,000 in the budget plan.

Wentworth distributes laptops to every undergraduate student and all faculty members to promote digital learning and support instruction. Students in the proposed MSCM program will also participate in this initiative.

Facilities and Equipment

Existing classroom facilities and equipment will be able to accommodate the needs of the proposed program. New faculty offices and graduate student space are anticipated and planned to be built for the proposed MSCM program.

Budget (Attachment B)

Attachment B contains the four-year expense and income projections for the start-up of the proposed MSCM program. There will be a need to hire a MSCM Program Director in year one. Year two will require the hiring of an additional full-time faculty and support staff member. Some additional build-out of facilities is also budgeted for this program. Additionally there are budget allocations for marketing, equipment, and student support to assist in launching the new program.

The fee to attend is a comprehensive \$7,300/semester and includes all materials, books, laptop computer, industry-related software, and registration fees.

Advisory Council

The Industry Professionals Advisory Council (IPAC) for the current undergraduate construction management program provides ties to alumni, construction and design professionals, and educators. Wentworth has established an IPAC sub-committee that will focus primarily on graduate education and the advancement of the proposed MSCM program. Meetings will be held each semester to introduce the Department to all participants and to highlight recent initiatives (new curriculum, community design efforts, etc.) Their presence will provide a direct

interface between the Department and the profession, especially with regard to practice. Their input on curriculum development and student learning outcomes will be critical to the program's success in preparing students for employment in the construction industry, as well as the pursuit of rewarding professional lives.

EVALUATION

Visiting Committee

The proposed program was evaluated January 10-12, 2010, by an external visiting committee comprising:

- Robert F. Cox, Ph.D., (chair), Department Head and Professor, Department of Building Construction Management, Purdue University;
- Thomas Rogers, P.E., Ph.D., Professor, Northern Arizona University; and
- Avi Wiesel, Ph.D., P.E., Associate Professor and Coordinator of Construction Graduate Programs, Del E. Webb School of Construction, School of Sustainable Engineering and the Built Environment (SEBE), Ira A. Fulton Schools of Engineering, Arizona State University.

The visiting committee found that the mission of the proposed MSCM is consistent with Wentworth's overall mission and that Wentworth has committed the fiscal resources necessary to support this MSCM degree offering. Further, the visiting committee commended Wentworth's commitment to faculty development and the advancement of scholarly work while focusing on teaching as the principle activity of faculty.

Given Wentworth's burgeoning focus on graduate education, the visiting committee recommended that Wentworth establish an administrative structure necessary to support its graduate educational offerings, develop measures to ensure that all courses in the MSCM program reflect the rigor and expectations of graduate level instruction, and define faculty scholarly expectations to ensure that those expectations are higher than those found for undergraduate levels. The visiting committee also made several recommendations specific to the curriculum.

Institutional Response

In response to the visiting committee's recommendations, Wentworth created a new Assistant Provost/Dean of Graduate Studies position responsible for the strategic development, vision, growth and leadership of graduate programs and established an institute-wide Graduate Committee to oversee the development of metrics to evaluate funded research, grant proposals, patents, publications, academic appointments, and additional graduate-related administrative duties. The Graduate Committee, Associate Provost/Dean of Graduate Studies, and the Faculty Federation at Wentworth will work collectively to develop the language and policies in order to require a higher expectation of scholarly pursuits for faculty teaching in the graduate programs. The curriculum was refined and re-configured to address the recommendations put forward by the visiting committee.

PUBLIC HEARING

The required public hearing was held on Tuesday, March 30, 2010, at 10 a.m. at the Department of Higher Education office. No comments were offered in opposition to the proposed program.

STAFF ANALYSIS AND RECOMMENDATION

After a thorough evaluation of all documentation submitted, staff is satisfied that the proposed Master of Science in Construction Management at Wentworth Institute of Technology meets the criteria set forth in 610 CMR 2.08(3) in the Degree-Granting Regulations for Independent Institutions of Higher Education accredited by the New England Association of Schools and Colleges. Recommendation is for approval.

ATTACHMENT A

Graduate Program Curriculum Outline

Major Required (Core) Courses (Total # of courses required = 10)		
Course Number	Course Title	Credit Hours
MGMT800	Business Finance and Investment	3
MGMT810	Business Operations and Process Management	3
MGMT820	Economics and International Business	3
MGMT830	Global Business Relations and HR Management	3
CCEV800	Research Methodology for CM	3
CCEV810	Executive Management for CM	3
CCEV	Construction Management Elective*	3
CCEV	Construction Management Elective*	3
CCEV	Construction Management Elective*	3
CCEV980	Capstone Research or Project Topics in CM	3
	Subtotal # Core Credits Required	30

Construction Management Electives*		
CCEV900	Construction Informatics	3
CCEV910	Advanced Building Systems	3
CCEV920	International Construction	3
CCEV930	Tunneling Construction	3
CCEV940	Sustainability Construction	3
CCEV950	Construction Modeling	3
Optional Elective Course (Total courses required = 0) (attach list of choices if needed)		
CCEV990	Thesis in CM	6
	Subtotal # Optional Elective Credits Required	6

ATTACHMENT B: BUDGET

Expense Budget

	FY10	FY11	FY12	FY13
	(start-up year)			
Faculty				
Full time (New Faculty yr 2)	\$50,000	\$104,000	\$208,160	\$212,486
Part time (Industry partners)	\$20,000	\$40,800	\$41,616	\$42,448
Library	\$0	\$0	\$10,000	\$10,000
Facilities (Offices & Grad Space)	\$100,000	\$0	\$0	\$100,000
Equipment				
Software	\$0	\$5,000	\$10,000	\$5,000
Program Support				
Administrative Staff (1Dir. & 1asst)	\$150,000	\$208,000	\$216,320	\$224,973
Start-up Capital	\$50,000	\$0	\$0	\$0
Faculty / Student support	\$10,000	\$10,000	\$20,000	\$20,000
Marketing / Adv.	\$10,000	\$35,000	\$15,000	\$15,000
The Arioeh Center	\$20,000	\$0	\$0	\$10,000
Student support services	\$10,000	\$10,000	\$0	\$0
Total Expenses	<u>\$420,000</u>	<u>\$412,800</u>	<u>\$521,096</u>	<u>\$639,907</u>

Income Budget

	FY10	FY11	FY12	FY13
Total Students	10	23	30	35
- 1st Year	10	15	18	20
- 2nd Year	0	8	12	15
* Semester #1	\$73,000	\$114,098	\$142,395	\$164,545
* Semester #2	\$73,000	\$114,098	\$142,395	\$164,545
* Semester #3	\$0	\$60,852	\$94,930	\$123,409
* Semester #4	\$0	\$60,852	\$94,930	\$123,409
* Semester #5	\$0	\$60,852	\$94,930	\$123,409
** Thesis Semester (assume 1 +1/yr)	\$0	\$7,607	\$15,822	\$24,682
Total Income	<u>\$146,000</u>	<u>\$418,361</u>	<u>\$585,401</u>	<u>\$723,998</u>
Total Expenses	<u>\$420,000</u>	<u>\$412,800</u>	<u>\$521,096</u>	<u>\$639,907</u>
Income	<u>-\$274,000</u>	<u>\$5,561</u>	<u>\$64,305</u>	<u>\$84,091</u>