

## **COST AND REVENUE PROJECTIONS NARRATIVE UNIVERSITY OF WISCONSIN-MILWAUKEE MASTER OF SCIENCE IN CONNECTED SYSTEMS ENGINEERING**

### **PROGRAM INTRODUCTION**

The University of Wisconsin-Milwaukee proposes to establish a Master of Science in Connected Systems Engineering (M.S. in Connected Systems Engineering), to be offered by UWM's College of Engineering and Applied Sciences, in collaboration with UWM's Lubar College of Business and the Connected Systems Institute. The Industrial and Manufacturing Department will serve as the home academic unit for accreditation purposes. The development of this program responds to the need to prepare students for careers in connected systems in the manufacturing and service industries.

This 31-credit program is designed so that students will have a set of core courses that will present the fundamentals of connected systems, followed by a collection of technical electives, which are categorized to emphasize several focus areas. Considering the recent faculty hires at the Industrial and Manufacturing department and the resources available at the Connected Systems Institute, no additional resources will be required for this program.

### **Section I - Enrollment**

The MS in CSE program is planned to start in Fall 2024. We anticipate 15 students to begin in year 1, and envision a 20% increase in enrollment per year for the initial five years of the degree program (see row 6). We estimate a yearly 90% retention rate (see row 7). Since the program is 31 cr, we estimate that full-time students will take 10 or 11 cr per semester and part-time will take 6 or 7 cr per semester which yields a 3-semester completion, for full-time students and 5 semester completion for part-time students. We assume 75% full-time (graduating in 3 semesters), 25% part-time (graduating in 5 semesters) to calculate (in row 8) the number of graduates each December. Now to calculate the Continuing Student Headcount (row 9), since the spreadsheet is arranged by year rather than semester, we count the students who will be graduating in the middle of that year as 0.5 (Thus, for the year 2 continuing students, you count 0.5 times the number who graduated (of the 90% retained year 1 new students, this is the 75% who were full time) and the part-time students from year 1 who continue all year, that's 25% of the 90% retained year 1 students. For years 3—5, continuing students: first, count 0.5 times the retained part-time students who entered two years prior and are now graduating after 5 semesters (that was 25% of the new students from two years prior with 90% retention); second, it's similar to the year 2 calculation, count 0.5 of the prior year's 75% of students who are graduating after 3 semesters due to being full-time, and then the count of the 25% of the prior year's new students who are continuing on in part-time status). We then list the total student headcount (row 10) for use in Table 1 of the Authorization to Implement document.

For calculating FTE, the full-time students are counted as 1.0 FTE and part-time as 0.5 FTE. For new student FTE (row 11) we again use the estimate of 75% full-time, 25% part-time.

For continuing student FTE (row 12), we use a similar calculation to the headcount of continuing students (row 9) but this time count only as 0.5 FTE each of the part-time students.

At the end of the first five years, about 112 students will have enrolled in the program and 67 will have graduated.

## **Section II – Credit Hours**

The program requirements consist of 31 total credits, as shown in pages 4-6 of the program description document. This is in tandem with the current UWM CEAS capstone-based MS programs. Of the courses in the listing, only three courses (with an asterisk) are being developed to be offered by Fall 2024. The rest are existing courses in UWM. Considering the array of courses that will be offered by several departments and schools, credits hours will be allocated to the respective generating unit. For the purposes of credit hour calculations, full-time and part-time students are estimated to take 10 and 6 credit hours per semester, thus enabling a 3-semester, and 5-semester time to graduation. This estimation does not include summer semesters. (Of course the program is flexible and students may take as few as 3-4 cr per semester, but the above assumptions were made for purposes of calculation.)

For calculating new credit hours (row 13), we interpreted this as credit hours taken by new students that year, so it's similar to the FTE calculation, instead of counting the full-time (75% of the students) as 1.0 FTE you count them as 10cr, and instead of counting the part-time (25% of the students) as 0.5 FTE you count them as 6 cr.

For calculating 'existing credit hours' (row 14), we interpreted this as credit hours taken that year by continuing students. Thus, these are also similar to the FTE calculations for continuing students, with the 1.0 FTE replaced by 10 cr and the 0.5 FTE for part-time students replaced by 6 cr.

## **Section III – Faculty and Staff Appointments**

The Industrial and Manufacturing Engineering Department has six faculty members (one non-tenured, five with tenure) and two instructional staff. Though not a requirement for the proposed MS in CSE, we anticipate that should there be additional financial resources at the college level, we may get additional faculty through the cluster hiring process in CEAS. We expect that 0.125 of each faculty and instructional staff's FTE will be dedicated to this program, for a total of 1.0 FTE devoted to the program. On the other hand, a 0.25 FTE is approximated for the administrative staff. None of these are new resources, all are existing staff.

## **Section IV – Program Revenues**

### Tuition Revenues

Tuition revenues have been calculated based on the Fall 2023 UWM graduate tuition and fees schedule for graduate students enrolled in the College of Engineering and Applied Sciences (Table 1). The revenue projections have been calculated conservatively, by considering that all students will pay resident tuition rates. We anticipate drawing some non-resident tuition-paying students. As indicated earlier, 75% of new students are anticipated to be full-time, taking 10 credit hours a semester, paying \$5350 in tuition per semester, not including \$782 in seg fees. 25% of new students are anticipated to be full-time, taking 6 credit hours a semester, paying \$3886 in tuition per semester, not including \$655 in seg fees.

For calculating tuition (row 20), it's similar to the FTE calculations for new and continuing students, but added together. So, instead of counting the full-time (75% of the students) as 1.0 FTE you count them as 2\*\$5350 (2 semesters of tuition for 10 cr), and instead of counting the part-time (25% of the students) as 0.5 FTE you count them as 2\*\$3886 (2 semesters of tuition for 6 cr).

Table 1: UWM Fall 2023 Graduate Tuition Schedule for the College of Engineering and Applied Sciences

| # of Credits | Resident | Non-Resident | Minnesota w/ Reciprocity | Midwest Rate | Segregated Fees* |
|--------------|----------|--------------|--------------------------|--------------|------------------|
| 1            | 1,006.67 | 1,846.11     | 1,532.63                 | 1,341.07     | 337.88           |
| 2            | 1,738.97 | 3,417.85     | 2,790.89                 | 2,407.77     | 401.39           |
| 3            | 2,471.27 | 4,989.59     | 4,049.15                 | 3,474.47     | 464.90           |
| 4            | 3,203.57 | 6,561.33     | 5,307.41                 | 4,541.17     | 528.41           |
| 5            | 3,935.87 | 8,133.07     | 6,565.67                 | 5,607.87     | 591.92           |
| 6            | 4,668.17 | 9,704.81     | 7,823.93                 | 6,674.57     | 655.43           |
| 7            | 5,400.47 | 11,276.55    | 9,082.19                 | 7,741.27     | 718.94           |
| 8+           | 6,132.77 | 12,848.29    | 10,340.45                | 8,807.97     | 782.45           |

A \$30 per credit Instructional Technology fee is assessed for any online or hybrid class in addition to the Segregated Fee. There is no credit plateau for the Instructional Technology Fee. The amounts listed on this fee schedule do not include any special course fees or differential tuition that will be charged in addition to the normal tuition and are not included in pricing plateau. Consult the Fall 2023 Schedule of Classes for a complete listing. Differential tuition is defined on the Additional/Differential per credit Charges table available from the Fall 2023 Tuition and Fee Rates page.

If a student enrolls in courses with online delivery, and especially from the Lubar School of Business, the student will incur an instructional technology fee of \$30 per credit for each credit of online delivery. Considering the variety of available technical elective courses, these added online-delivery fees have not been included in the revenue projections. In addition, no tuition increase has been considered in the revenue projections.

Program/Course Fees

N/A

Grants/Extramural Funding

N/A

Program Revenue (PR)

N/A

General Program Revenue (GPR)

N/A

**Section V – Program Expenses**

Salary and Fringe Expenses

The total salaries of the current six faculty members and two instructional staff in the department are \$626,796 and \$121,000 respectively. 0.125 of the total salary has been charged to this program as an expense. We have a 0.5 administrative support (shared between two departments), for a 0.5 administrative salary of \$25,000. Similarly, 0.25 of the administrative salary has been charged as an expense to this program. The 5-year projections in the total salaries have incorporated a 3% increase per year.

Other Expenses

The department will use an eighth of the department's annual S&E allocations (approximately \$1,250) to fund to support annual technology and software needs of the program.

**Section VI – Net Revenue**

The net revenues as shown in the cost and revenue projection spreadsheet will be distributed according to the UWM's budget model.