University of Dayton
School of Engineering

Rev 7/2021

M.S. CPE Curriculum

Core CPE Coursework (9 Semester Hours) (6 ECE, 3 CPS)

ECE 501	Contemporary Digital Systems	3 Sem. Hrs.	CPS 510	Systems Analysis	3 Sem. Hrs.
ECE 532	Embedded Systems	3 Sem. Hrs.	CPS 536	Operating Systems I	3 Sem. Hrs.
ECE 533	Computer Design	3 Sem. Hrs.	CPS 570	Data Communications	3 Sem. Hrs.

Specialization (9 Semester Hrs. for thesis, 12 Semester Hrs. for non-thesis) (6 ECE, 3 CPS min.)

Embedded Systems:

ECE 506	Microelectronic Devices	3 Sem. Hrs.	*ECE 531 CMOS Analog IC Design*		3 Sem. Hrs.
ECE 530	Digital IC Design	3 Sem. Hrs.	ECE 632	Contemporary Microelectronics	3 Sem. Hrs.

Software Engineering:

ECE 538 Object-Oriented Programming		3 Sem. Hrs.	CPS 552	Discrete Event Simulation Tech.	3 Sem. Hrs.
CPS 512 Systems Design		3 Sem. Hrs.	CPS 560	Computer Graphics	3 Sem. Hrs.
CPS 522	Software Project Management	3 Sem. Hrs.	*CPS 562 Database Management Systems II*		3 Sem. Hrs.
CPS 530	Algorithm Design	3 Sem. Hrs.	CPS 580	Artificial Intelligence	3 Sem. Hrs.
CPS 542 Database Management Systems		3 Sem. Hrs.	CPS 581	Advanced Artificial Intelligence	3 Sem. Hrs.
CPS 543 Comparative Languages		3 Sem. Hrs.	CPS 582	Automata Theory	3 Sem. Hrs.
CPS 544 Systems Programming I		3 Sem. Hrs.			

Operating Systems and Computer Architecture:

ECE 536 Microprocessor Applications		3 Sem. Hrs.	*ECE 636 Advanced Computer Architecture*		3 Sem. Hrs.
ECE 551	Parallel Computing	3 Sem. Hrs.	ECE 637	Concurrent Processing	3 Sem. Hrs.

Communications, Networking, and Information Processing:

ECE 503	Random Processes	3 Sem. Hrs.	ECE 567	Machine Learning-Pattern Class.	3 Sem. Hrs.
ECE 505 Digital Signal Processing I		3 Sem. Hrs.	*CPS 572 Computer Networking*		3 Sem. Hrs.
ECE 509	Analysis of Linear Systems	3 Sem. Hrs.	ECE 595	Network Security	3 Sem. Hrs.
ECE 521	Digital Communications I	3 Sem. Hrs.	ECE 595	Deep Learning	3 Sem. Hrs.
ECE 522	Digital Communications II	3 Sem. Hrs.	ECE 595	Advanced Image Processing	3 Sem. Hrs.
ECE 563	Image Processing	3 Sem. Hrs.			

Thesis (6 Semester Hours)

ECE 599 or CPS 599 (Depending on Advisor) Thesis — 6 Semester Hours

Technical Electives (6 Semester hours for thesis, 9 Semester Hours for non-thesis)

Courses chosen with approval of advisor — 6/9 Semester Hours

TOTAL — 30 Semester Hours

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Culminating Academic Experience

All MSCPE graduates will have a culminating academic experience through completion of one of three possible options available to them. These options are:

- Successful completion of a Master's Thesis. Currently, ECE Department policy requires a thesis for students who are supported as Research or Teaching Assistants. The thesis option requires a minimum of 24 semester hours of coursework, plus 6 semester hours of thesis credit.
- Successful completion of 30 semester hours of coursework, plus a less substantial, non-thesis research/design project, including submission of a written report of suitable length and a seminar presentation to interested faculty and students. All such projects will be supervised by a faculty member with similar research interests.
- Successful completion of 30 semester hours of coursework, including two approved 3 semester hour courses requiring extensive project-based learning.

MSCPE students may complete one or more of the above options in order to satisfy the culminating experience requirement. In most cases, students will be encouraged to select either of the first two options. In some cases, however (e.g., when language and/or technical writing skills are poorly developed, or when a student begins the program with extensive prior work experience, etc.), the third option may be the better choice. Option #3 involves taking 6 credit hours of approved, upper level, extensive project-based learning (EPBL) courses in a single concentration area (i.e., Embedded Systems, Software Engineering, Operating Systems and Computer Architecture, or Communications and Networking).

The EPBL courses are highlighted in red above, as well as underscored.

All of the EPBL courses are advanced courses that include a large design component. Each requires students to design their own solutions to advanced engineering problems. Collectively, the projects students will pursue will require them to leverage technical skills and knowledge acquired across earlier core and elective coursework.

The MSCPE program director will review the records of all potential M.S. CPE graduates to ensure that all graduation requirements are fulfilled, including successful completion of at least one of the culminating educational experiences described above. Each of the options requires a total of at least 30 semester hours of credit for successful completion of the degree program.