Master of Science in Systems Science & Mathematics (MSSSM)

Master’s Degrees

Either a thesis option or a course option may be selected. The special requirements for these options are as follows:

Course Option

This option is intended for those employed in local industry who wish to pursue a graduate degree on a part-time basis, or for full-time students who do not seek careers in research. Students must have a cumulative grade point average of at least 3.2 out of a possible 4.0 over all courses applied toward the degree. Under the course option, students may not take ESE 599 Master’s Research, and with faculty permission may take up to 3 units of ESE 500 Independent Study.

Thesis Option

This option is intended for those pursuing full-time study and engaged in research projects. Candidates for this degree must complete a minimum of 24 credit hours of course instruction and 6 credit hours of thesis research (ESE 599). Three (3) of these credit hours of thesis research may be applied toward the 15 core electrical engineering credit hours required for the MSEE program. Any of these 6 hours of thesis research may be applied as electives for the MSEE, MSSSM, MSDAS, MCEng and MEngR programs. The student must write a master’s thesis and defend it in an oral examination.

MS in Systems Science & Mathematics

The Master of Science in Systems Science & Mathematics (MSSSM) is an academic master’s degree designed mainly for both full-time and part-time students interested in proceeding to the departmental full-time doctoral program and/or an industrial career.

- The MS degree requires 30 units, which may include optionally 6 units for thesis or independent study.
- Required courses (15 units) for the MS degree include:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Units</th>
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<tbody>
<tr>
<td>ESE 551</td>
<td>Linear Dynamic Systems I</td>
<td>3</td>
</tr>
<tr>
<td>ESE 553</td>
<td>Nonlinear Dynamic Systems</td>
<td>3</td>
</tr>
<tr>
<td>ESE 520</td>
<td>Probability and Stochastic Processes</td>
<td>3</td>
</tr>
<tr>
<td>ESE 415</td>
<td>Optimization 1</td>
<td>3</td>
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and one chosen from the following courses:

- ESE 524 Detection and Estimation Theory
- or ESE 544 Optimization and Optimal Control
- or ESE 545 Stochastic Control
- or ESE 557 Hybrid Dynamic Systems

Total Units 15

1 ESE 516 may be substituted for ESE 415.

- The remaining courses in the program may be selected from senior- or graduate-level courses in Electrical & Systems Engineering or elsewhere in the university. Courses outside of Electrical & Systems Engineering must be in technical subjects relevant to systems science and mathematics and require the department’s approval.
- ESE 590 Electrical & Systems Engineering Graduate Seminar must be taken each semester. Master of Science students must attend at least three seminars per semester.
- The degree program must be consistent with the residency and other applicable requirements of Washington University and the School of Engineering & Applied Science.
- Students must have a cumulative grade point average of at least 3.2 out of a possible 4.0 over all courses applied toward the degree.