Master of Science in Systems Science & Mathematics (MSSSM)

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

**Course Option**

The Master of Science in Systems Science & Mathematics (MSSSM) is an academic master's degree that requires the completion of 30 credit units. It is designed for both full-time and part-time students interested in proceeding to the departmental full-time doctoral program and/or an industrial career. Under the course option, students may not take ESE 599 Master's Research. With faculty permission, they may take up to 3 units of graduate-level 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 units of course instruction and 6 credit units of thesis research (ESE 599); 3 of these units of thesis research may be applied toward the 15 core electrical engineering units required for the MSEE program. Any of these 6 units 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.

**Degree Requirements**

- Required courses (15 units) for the MS degree include the following:

<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 course chosen from the following:

- ESE 524 | Detection and Estimation Theory | 3
- or ESE 544 | Optimization and Optimal Control | 3
- or ESE 545 | Stochastic Control              | 3
- or ESE 557 | Hybrid Dynamic Systems          | 3

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 ESE or elsewhere in the university that are approved by the department. Please consult the ESE departmental website (https://ese.wustl.edu/graduate/degreeprograms/Pages/ms-systems-science-mathematics.aspx) for a list of allowable electives.
- A maximum of 6 units may be transferred from another institution and applied toward the master's degree.
- ESE 590 Electrical & Systems Engineering Graduate Seminar must be taken by full-time graduate students each semester. This course is taken with an unsatisfactory/satisfactory grade option.
- The degree program must be consistent with the residency and other applicable requirements of Washington University and the McKelvey School of Engineering.
- Students must obtain a cumulative grade-point average of at least 3.0 out of a possible 4.0 overall for courses applied toward the degree. Courses that apply toward the degree must be taken with the credit/letter grade option.