## Engineering and Science Management (ESM)

**College of Engineering and Mines**  
Department of Civil, Geological, and Environmental Engineering ([https://www.uaf.edu/cem/](https://www.uaf.edu/cem/))  
907-474-7241

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<th>Course Code</th>
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Staked with ESM F622.  
Lecture + Lab + Other: 3 + 0 + 0  
Grading System: Letter Grades with option of Plus/Minus |
| ESM F450    | Economic Analysis and Operations                 | 3       | Fall and Summer| Offered Fall and Summer. Fundamentals of engineering economy, project scheduling, estimating, legal principles, professional ethics and human relations. Prepares students for the engineering economics section of the Fundamentals of Engineering licensing exam. May not be used as credit toward the M.S. degree in Engineering Management or Science Management. | Prerequisites: WRTG F111X, WRTG F211X, WRTG F212X, WRTG F213X or WRTG F214X; senior standing in engineering.  
Special Notes: Undergraduate engineering students taking graduate ESM courses as technical electives should have completed or be concurrently enrolled in ESM F450.  
Lecture + Lab + Other: 3 + 0 + 0  
Grading System: Letter Grades with option of Plus/Minus |
| ESM F492    | Engineering Mgt Seminar                          | 1       |                | Offered Fall and Summer. Fundamentals of engineering economy, project scheduling, estimating, legal principles, professional ethics and human relations. Prepares students for the engineering economics section of the Fundamentals of Engineering licensing exam. May not be used as credit toward the M.S. degree in Engineering Management or Science Management. | Recommended: Calculus through MATH F302.  
Staked with ESM F622.  
Lecture + Lab + Other: 0 + 0 + 0  
Grading System: Letter Grades with option of Plus/Minus |
| ESM F492P   | Engineering Mgt Seminar                          | 1       |                | Offered Fall and Summer. Fundamentals of engineering economy, project scheduling, estimating, legal principles, professional ethics and human relations. Prepares students for the engineering economics section of the Fundamentals of Engineering licensing exam. May not be used as credit toward the M.S. degree in Engineering Management or Science Management. | Recommended: Calculus through MATH F302.  
Staked with ESM F622.  
Lecture + Lab + Other: 0 + 0 + 0  
Grading System: Letter Grades with option of Plus/Minus |
| ESM F601    | Managing and Leading Engineering Organizations   | 3       |                | Offered As Demand Warrants. Leadership knowledge and skills as applied to motivation, direction and communication within engineering and technical organizations, and their relations with other organizations and the public. Leadership training activities include organizational structures, planning, monitoring, directing and controlling. Review of management tools including management theory, communications and conflict resolution. | Prerequisites: Recommended. BS degree in engineering or physical science.  
Lecture + Lab + Other: 3 + 0 + 0  
Grading System: Letter Grades with option of Plus/Minus |
| ESM F605    | Engineering Economic Analysis                    | 3       |                | Offered As Demand Warrants. The economic basis of engineering decisions: capital investment analysis techniques, including present worth, annual cash flow and rate of return. Applications to replacement problems, benefits/cost analysis and capital budgeting. Consideration of impacts of depreciation accounting, income taxes and inflation. Risk and uncertainty in economic decisions. | Recommended: Graduate standing.  
Lecture + Lab + Other: 3 + 0 + 0  
Grading System: Letter Grades with option of Plus/Minus |
| ESM F608    | Legal Principles for Engineering Management      | 3       |                | Offered As Demand Warrants. Those aspects of law specifically related to technical management. Contracts, sales, real property, business organization, labor, patents and insurance. | Recommended: Graduate standing.  
Lecture + Lab + Other: 3 + 0 + 0  
Grading System: Letter Grades with option of Plus/Minus |
| ESM F609    | Project Management                               | 3       |                | Offered As Demand Warrants. Organizing, planning, scheduling and controlling projects. Use of CPM and PERT; computer applications. Case studies of project management problems and solutions. | Recommended: Graduate standing.  
Lecture + Lab + Other: 3 + 0 + 0  
Grading System: Letter Grades with option of Plus/Minus |
Lecture + Lab + Other: 3 + 0 + 0  
Grading System: Letter Grades with option of Plus/Minus |
| ESM F622    | Engineering Decisions                            | 3       |                | Offered As Demand Warrants. Risk and uncertainty in engineering decisions. Basic applied probability and statistics, data analysis, regression analysis and time series. Practical applications of decision tools: linear programming, inventory analysis, queuing, network models and utility theory. A class project and paper are required. | Recommended: Calculus through MATH F302.  
Lecture + Lab + Other: 3 + 0 + 0  
Grading System: Letter Grades with option of Plus/Minus |
ESM F684  Engineering Management Project
3 Credits
Offered As Demand Warrants
Comprehensive study of an actual engineering management problem resulting in reports and presentations which include recommendations for action.
Prerequisites: Graduate standing in Engineering Science Management.
Lecture + Lab + Other: 3 + 0 + 0
Grading System: Letter Grades with option of Plus/Minus

ESM F692  Engineering Mgt Seminar
1 Credit
Lecture + Lab + Other: 0 + 0 + 0
Grading System: Letter Grades with option of Plus/Minus
Repeatable for Credit: May be taken unlimited times for up to 99 credits

ESM F698  Non-thesis Research/Project
1-6 Credits
Lecture + Lab + Other: 0 + 0 + 0
Grading System: Pass/Fail Grades
Repeatable for Credit: May be taken unlimited times for up to 99 credits

ESM F699  Thesis
1-9 Credits
Lecture + Lab + Other: 0 + 0 + 0
Grading System: Pass/Fail Grades
Repeatable for Credit: May be taken 98 times for up to unlimited credits