

Scheme of Studies for MS Materials Engineering Program

List of Courses

| Mandatory Courses (12 CH) | | | |
|----------------------------------|---------------------|---|---------------------|
| Sr. No. | Course Codes | Course Title | Credit Hours |
| 1 | MSE-501 | Research Methodology | 0 |
| 2 | MSE-502 | Introduction to Engineering Materials (for Non-Engineering Students) | 0 |
| 3 | MSE-511 | Advanced Thermodynamics | 3 |
| 4 | MSE-512 | Phase Transformation & Microstructures | 3 |
| 5 | MSE-513 | Mechanical Behavior of Materials | 3 |
| 6 | MSE-521 | Advanced Characterization Techniques | 3 |
| 7 | MSE-5XX | MS Thesis | 6 |

| *Technical & Non-Technical Electives (12 CH) | | | |
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| Sr. No. | Course Codes | Course Title | Credit Hours |
| 1 | MSE-522 | Advanced Extractive Metallurgy | 3 |
| 2 | MSE-523 | Modern Steel Making | 3 |
| 3 | MSE-524 | Rare Earth Metals | 3 |
| 4 | MSE-525 | Refractories for Steel Making and Continuous Casting | 3 |
| 5 | MSE-526 | Industrial Waste Management | 3 |
| 6 | MSE-527 | Advanced Mineralogy | 3 |
| 7 | MSE-528 | Metallurgical Plant Design | 3 |
| 8 | MSE-529 | Theory of Dislocations | 3 |
| 9 | MSE-530 | Fracture and Failure Analysis | 3 |
| 10 | MSE-531 | Metal Forming | 3 |
| 11 | MSE-532 | Thermo-mechanical Processing | 3 |

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| 12 | MSE-533 | Microstructural and Texture Control | 3 |
| 13 | MSE-534 | Advanced Manufacturing Systems | 3 |
| 14 | MSE-535 | Advanced Joining Technology | 3 |
| 15 | MSE-536 | Tribology Engineering | 3 |
| 16 | MSE-537 | Thin Film Technology | 3 |
| 17 | MSE-538 | Advanced Coating Technology | 3 |
| 18 | MSE-539 | Carbon Materials | 3 |
| 19 | MSE-540 | Polymer Science and Engineering | 3 |
| 20 | MSE-541 | Smart Materials | 3 |
| 21 | MSE-542 | Advanced Ceramics Engineering | 3 |
| 22 | MSE-543 | Aerospace Materials | 3 |
| 23 | MSE-544 | Biomaterials | 3 |
| 24 | MSE-545 | Additive Manufacturing & 3D Printing | 3 |
| 25 | MSE-546 | Quality Management Systems | 3 |
| 26 | MSE-547 | Finite Element Methods | 3 |
| 27 | MSE-548 | Laser Processing of Materials | 3 |
| 28 | XXX-XXX | Total Quality Management | 3 |
| 29 | XXX-XXX | Project Management | 3 |
| 30 | XXX-XXX | Production & Operations Management | 3 |

*Depending upon the research interest and availability of relevant faculty.

Total Credit Requirements (30 CH)

For the award of MS degree in Materials Engineering, a student has to complete 30 credit hours.