**SYLLABUS**

**MATERIALS SCIENCE (MAL 201E)**

**(CRN 14484)**

**(Monday 13.30-16.30 p.m.)**

**Course Plan:**

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| **17 September 2018** – General Introduction to the Course  **24 September 2018** – Materials Science, Basic Terms and Concepts, Historical Development, Classification of Materials, Selection Criteria for Materials |
| **1 October 2018** – Atomic Structures, Electronic Configuration, Atomic Bonding, Atomic and Ionic Arrangements |
| **8 October 2018** – The Structure of Crystalline Solids, Crystal Geometry, Types of Lattices |
| **15 October 2018** – Imperfections in Solids |
| **22 October 2018** – Atom Movement in Materials (Diffusion) |
| **29 October 2018** – National Holiday |
| **5 November 2018** – Term Break |
| **12 November 2018** – MIDTERM EXAM # 1 |
| **19 November 2018** – Mechanical Properties of Metals and Mechanical Tests |
| **26 November 2018** – Dislocations and Strengthening Mechanisms, Failure  **3 December 2018** – Alloy Systems, Phase Diagrams, Phase Transformations, Heat Treatment |
| **10 December 2018** – Ceramics, and Composites |
| **17 December 2018** – MIDTERM EXAM # 2 |
| **24 December 2018** – Corrosion and Degradation Mechanisms of Materials |

**Textbooks:**

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| [Donald R. Askeland](https://www.amazon.com/Donald-R.-Askeland/e/B001IOH47O/ref=dp_byline_cont_book_1), The Science and Engineering of Materials, ISBN-13: 978-0495296027; ISBN-10: 0495296023.  * [William D. Callister Jr.](https://www.amazon.com/s/ref=dp_byline_sr_book_1?ie=UTF8&text=William+D.+Callister+Jr.&search-alias=books&field-author=William+D.+Callister+Jr.&sort=relevancerank), [David G. Rethwisch](https://www.amazon.com/s/ref=dp_byline_sr_book_2?ie=UTF8&text=David+G.+Rethwisch&search-alias=books&field-author=David+G.+Rethwisch&sort=relevancerank), Materials Science and Engineering: An Introduction, ISBN-13: 978-0470419977; ISBN-10: 0470419970. |
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**Assessment Tools:**

* Midterm exam # 1 – 25 %
* Midterm exam # 2 – 25 %
* Final exam – 50 %