Introduction to Structural Materials (MA3e22L3)

担当教員： 醍醐 市朗 特任准教授，松浦 宏行 准教授

対象：第３学年	単位数：2.0	バイオ	環境・基盤	ナノ・機能
		標準	限定	標準

実施時期：インテンシヴターム 木曜日 2，3，4 時限（詳細は別途掲示）	場所：４１号講義室

講義目的

In production and consumption of materials, structural materials are dominant. Technological development in materials industry affects significant positive impacts in broad end uses. A newly developed high performance materials fulfill higher design requirement, which makes more advanced product design possible. This class introduces production process of major materials and life cycle perspective on materials, especially structural materials. We discuss interactions amongst materials, finished products, economy, and environment in order to understand roles of materials in industrial metabolism. Global material flows and resource strategy are also introduced to give you a global vision on resources and materials.

講義項目

1. Life cycle of materials,
2. Environmental issues relevant to materials,
3. Urban mine and materials stock,
4. Use of structural materials,
5. Processing of steel,
6. Cyclic use of steel,
7. Recycling of byproducts and wastes, and
8. Treatment of end-of-life products

理解すべき事項

Following keywords are taught,

- Life cycle perspective,
- Environmental carrying capacity,
- Materials flow and stock in the world,
- Product design and materials selection.
- Thermodynamics and kinetics in production processes,
- Microstructure control and processing, and
- Current recycling systems

関連する講義

事前履修：基礎熱力学、材料相平衡論、応用熱力学、材料強度学、金属材料学、マテリアル環境学、材料信頼性学、構造材料学、生産プロセス工学、セラミック材料学

並行履修：

事後履修：

参考書（テキスト）：講義にて配布

参考書（演習書）：

講義ノートのリンク先：-

成績評価：

備考