

## Elective Course Description (2. Spring Semester)

Subject (English)	Materials Science and Engineering B		Semester	Spring	Day/Slot	
科目名 (日本語)	材料科学 B					
Course Code		Course Numbering	TMA-MEE216		Period	Apr. – Aug.
Instructor (Post)	Prof. Katsunari Oikawa				Campus	
					Building	
Faculty	Department of Materials Science and Engineering		Credits	2	Class Room	
Class subject	-					
Object and summary of class						
<p>“Materials Science and Engineering B” is a half year class to learn the fundamentals of the “Materials Processing” based on the high temperature physical chemistry and process engineering. This class basically consists of three parts as thermodynamics for materials processing, ferrous and process metallurgy (iron- and steel-making), nonferrous metallurgy (pyro- and hydro-metallurgy), and electro-metallurgy in active metal processing. Students can study fundamentals and latest topics in the area of materials processing and engineering.</p>						
Keywords	-					
Goal of study						
-						
Contents and progress schedule of class						
<ol style="list-style-type: none"> <li>1. Guidance</li> <li>2. Introduction to chemical thermodynamics for materials processing I</li> <li>3. Introduction to chemical thermodynamics for materials processing II</li> <li>4. Reduction/Oxidation equilibrium for materials.</li> <li>5. Stability diagrams and phase diagrams of materials.</li> <li>6. Basic principle of iron and steel making.</li> <li>7. Fundamentals of pyrometallurgy I</li> <li>8. Fundamentals of pyrometallurgy II</li> <li>9. Application of pyrometallurgy (Copper making)</li> <li>10. Application of pyrometallurgy (Zinc, Lead production)</li> <li>11. Fundamental electrochemistry in metallurgy</li> <li>12. Application of hydrometallurgy</li> <li>13. Aluminum and active metal production I</li> <li>14. Aluminum and active metal production II</li> <li>15. Final examination</li> </ol>						
Preparation	-					
Record and evaluation method	The grade of students will be evaluated with the score of home works, class participation, exercises during the class and the final examination.					
Textbook and references	-					
Self study	-					
In addition	-					