

## Elective Course Description (2. Spring Semester)

Subject (English)	Fundamentals of Information Science II		Semester	Spring* Quarter Subject	Day/Slot	
科目名 (日本語)	情報科学基礎 II					
Course Code		Course Numbering	TMA-MEE328		Period	Jun. – Aug. (Quarter)
Instructor (Post)	Assoc. Prof. Hideaki Goto				Campus	
					Building	
Faculty	Department of Mechanical and Aerospace Engineering		Credits	2	Class Room	
Class subject	Aims: Students will acquire basic knowledge about algorithms and data structures.					
Object and summary of class						
Descriptions:	Evaluation methods and programming techniques for making good programs are discussed.					
Keywords	-					
Goal of study						
Goals:	On completing the course, students should have the ability of designing and making good programs.					
Contents and progress schedule of class						
	<ol style="list-style-type: none"> <li>1. Introduction of this course, Computation, Algorithms</li> <li>2. Evaluation of computational complexity</li> <li>3. Data structures, Abstract Data Types (ADTs)</li> <li>4. Basic data structures: array, list</li> <li>5. Basic data structures: stack, queue</li> <li>6. Basic data structures: graph, tree</li> <li>7. Basic data structures: set, table (dictionary), hashing</li> <li>8. Priority queue, heap</li> <li>9. Binary search tree and Balanced search tree</li> <li>10. Sorting: bubble sort, shell sort, bucket sort, radix sort, insertion sort</li> <li>11. Sorting: heap sort, quick sort, merge sort</li> <li>12. Graph searching: breadth-first search, depth-first search</li> <li>13. Graph algorithms: minimum spanning tree, shortest path problem</li> <li>14. Optimization problems</li> <li>15. Wrap-up and Final Examination</li> </ol>					
Preparation	-					
Record and evaluation method	The grade will come from the in-class final exam (30%) and two or three assignments (70%). The final exam might be changed to an additional assignment.					
Textbook and references	<ol style="list-style-type: none"> <li>1. 『Data Structures in Java』 Thomas A. Standish Addison-Wesley 1997 <a href="#">020130564X</a> reference</li> <li>2. 『Data Structures, Algorithms &amp; Software Principles in C』 Thomas A. Standish Addison-Wesley 1995 <a href="#">0201591189</a> reference</li> <li>3. 『Cによるアルゴリズムとデータ構造』 茨木俊秀 オーム社 2014 <a href="#">978-4274216046</a> reference</li> </ol>					
Self study	-					
In addition	<p>Prerequisites for regular course students are "The Basics of Information Sciences" and "Programming Seminar."</p> <p>Taking "Fundamentals of Computer Engineering" is strongly recommended.</p> <p>Prerequisites for JYPE/DEEP/IMAC-U students are the similar courses as mentioned above.</p> <p>Students should have some knowledge about a programming language, preferably C or Java.</p>					