**Course Syllabus**

Course Number SCME 211

Course Title Computer Programming and Simulation

Credits 3 Credits (3-0-6)

Faculty Faculty of Science

Semester/Year Second / 2020

Hours/Date/Time 3 Hours / Thursday / 9:00 AM – 12:00 PM

Instructor Dr. Chaiwoot Boonyasiriwat (chaiwoot@gmail.com)

Course Web Page http://mcsc.sc.mahidol.ac.th/courses/cps/

Degree Bachelor of Science (Materials Science and Nano Engineering)

Course Topics HTML, CSS, JavaScript, Java, MATLAB, numerical simulation

Teaching Methods Lecture and in-class practice

Media Presentation slides and programming demonstration

Assignments Assignments will be assigned every week and due within one week

Learning Outcomes Student should

* Be able to create web pages using HTML and CSS
* Be able to write JavaScript programs to solve problems
* Be able to write Java programs to solve problems
* Be able to write MATLAB programs to solve problems
* Be able to use mathematical methods and write programs to perform some numerical simulation and calculation

Evaluation - Assignments 60%

* Class attendance and participation 5%
* Term project 35%

Grading Letter grades will be assigned based on the total score percentage of each

student according to the following table

Score Percentage Range Letter Grade

[80,100] A

[75,80) B+

[70,75) B

[65,70) C+

[60,65) C

[55,60) D+

[50,55) D

[0,50) F

References

* https://www.w3schools.com
* M. Ogihara, 2018, Fundamentals of Java Programming, Springer.
* C. Xu, 2018, Leaning Java with Games, Springer.

Tentative Course Schedule

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| --- | --- | --- |
| Week | Date | Topics |
| 1 | Jan 21 | Hypertext markup language (HTML) |
| 2 | Jan 28 | Cascading style sheet (CSS) |
| 3 | Feb 4 | JavaScript: syntax, statements, variables, data types, operators, expressions, Strings, numbers, functions |
| 4 | Feb 11 | JavaScript: arrays, objects, conditional statements (if, else, else if, switch) |
| 5 | Feb 18 | JavaScript: iterations (for loop, while loop, break, continue) |
| 6 | Feb 25 | JavaScript: exception handling (try, catch, throw, finally), object-oriented programming |
| 7 | Mar 4 | HTML document object model (DOM) |
| 8 | Mar 11 | HTML graphics (Google Maps, SVG, Canvas) |
| 9 | Mar 18 | Java: syntax, variables, data types, operators, arrays, objects, methods |
| 10 | Mar 25 | Java: conditional statements, iterations, inputs and outputs |
| 11 | Apr 1 | Java: graphics user interface (GUI), GUI layout design, mouse and keyboard events |
| 12 | Apr 8 | Java: drawing, animations |
| 13 | Apr 22 | MATLAB: syntax, variables, data types, operators, arrays, functions, conditional statements, iterations |
| 14 | Apr 29 | MATLAB: inputs and outputs, graphics |
| 15 | May 6 | Simulation: numerical methods for solving ODEs |
| 16 | May 13 | Simulation: Monte Carlo simulation |
| 17 | TBA | Project presentation |