| Tsuyama College  |  | Year   | 2020   |  |                                 |   | Course<br>Title   | Machine Design Creative<br>Practice |                          |  |
|--|--|--|--|--|---------------------------------|---|---|-------------------------------------|--------------------------|--|
| Course Informati   | on   |  |  |  |                                 |   |   |                                     |                          |  |
| Course Code  | rse Code 0097  |  |  |  |                                 |   | Specializ   | Specialized / Elective              |                          |  |
| Class Format   | Seminar  |  |  | Course Categor<br>Credits  |                                 |   | Academi   | c Credit:                           | 2                        |  |
| Department   | Technology   | of Integrated<br>Communicatic<br>s System Prog   | d Student Grade  |  | de                              | 4th   |   |                                     |                          |  |
| Term   | Second Sem   | lester   |  | Classes per Week   |                                 | 2   |   |                                     |                          |  |
| Textbook and/or<br>Teaching Materials  |  | Textbooks :Exercises are distributed separately. |  |  |                                 |   |   |                                     |                          |  |
| Instructor   | SHIOTA Hiro  | ohisa  |  |  |                                 |   |   |                                     |                          |  |
| Course Objective   | S  |  |  |  |                                 |   |   |                                     |                          |  |
| Learning purposes :<br>Course Objectives :<br>1. To solve mechanic<br>2. To consider approp<br>3. To acquire necessa | al engineering<br>priate analysis  | g problems us<br>s conditions fo                 | ing g  | eneral-purpo<br>blems.   | -                               | ering b   | y utilizing ge  | eneral-pu                           | irpose software.         |  |
| Rubric   |  |  |  |  |                                 |   |   |                                     | 1                        |  |
|  |  | Excellent  |  | Good   |                                 | Acceptable  |   |                                     | Not acceptable           |  |
| Achievement 1  | enginee<br>and exp<br>contents   | nd explain their                                 |  | Solve problems in<br>mechanical engineering<br>by using general-purpose<br>programs. |                                 | Solve simple problems in<br>mechanical engineering<br>by using general-purpose<br>programs. |   | eering                              | Not reached to the left. |  |
| Achievement 2  |  | and explain it                                   |  | Be able to se<br>appropriate<br>conditions fo<br>problem.                            | nalysis approp<br>the condition |   | le to select<br>priate analysis<br>ions for the<br>em with advice |                                     | Not reached to the left. |  |
| Achievement 3 necessa  |  | lain them  | btain the<br>y information<br>analysis results<br>ain them |  | ılts                            | Able to obtain simple information from the analysis results.                                |   |                                     | Not reached to the left. |  |
| Assigned Departr   | nent Obiec   | tives  |  |  |                                 |   |   |                                     | ·                        |  |
| Teaching Method  |  |  |  |  |                                 |   |   |                                     |                          |  |
| reaching riceitea  |  | Specialized · Si                                 | necia  | lized  |                                 |   |   |                                     |                          |  |
|  | General or Specialized : Specialized   |  |  |  |                                 |   |   |                                     |                          |  |
|  | Field of learning : Material, Design and Manufacturing   |  |  |  |                                 |   |   |                                     |                          |  |
|  | Required, Elective, etc. : Elective must complete subjects   |  |  |  |                                 |   |   |                                     |                          |  |
|  | Foundational academic disciplines : Engineering/Mechanical engineering   |  |  |  |                                 |   |   |                                     |                          |  |
| Outline  | Relationship with Educational Objectives : This class is equivalent to "(3) Acquire deep foundation knowledge of the major subject area".  |  |  |  |                                 |   |   |                                     |                          |  |
|  | Relationship with JABEE programs : The main goals of learning / education in this class are "(A), A-2", also "D-1" and "F-2" is involved.  |  |  |  |                                 |   |   |                                     |                          |  |
|  | Course outline : Basic problems of mechanical engineering are analyzed by using CAD or general analysis software.  |  |  |  |                                 |   |   |                                     |                          |  |
| Style  | Course method : The class is conducted using PC, projector and blackboard. Students are required to analyze their own work using general-purpose software. Students are required to submit a report, and they may be required to take an oral examination to confirm their understanding of the subject. |  |  |  |                                 |   |   |                                     |                          |  |
|  | Grade evaluation method : Grading will be based on the average of the scores of each report. All reports must be submitted, and no credit will be given if there is one report not submitted.  |  |  |  |                                 |   |   |                                     |                          |  |
| Notice   | Precautions on the enrollment : This is a "class that requires study outside of class hours". Classes are offered for 15 hours per credit, but 30 credit hours are required in addition to this. Follow the instructions of your instructor for these studies.   |  |  |  |                                 |   |   |                                     |                          |  |
|  | Course advice : Students learn how to solve basic mechanical engineering problems using different tools. Students are required to have a basic knowledge of the original discipline in order to read the data necessary for design from the analysis results.  |  |  |  |                                 |   |   |                                     |                          |  |
|  | Foundational subjects :<br>Introduction to CAD (2nd year), Machine Design and Drawing I (2nd), Materials Technology(2nd), Design of<br>Machine Elements I (3rd), Strength of Materials I (3rd), Machine Design and Drawing II (3rd)  |  |  |  |                                 |   |   |                                     |                          |  |
|  | Related subjects : Design of Machine Elements II (4th year), Strength of Materials II (4th), Graduation Thesis(5th)  |  |  |  |                                 |   |   |                                     |                          |  |
|  | Attendance advice : It is essential to understand the basic knowledge of the original discipline in order to read the data necessary for design from analysis results. Students are encouraged to review CAD and other tools on their own to familiarize themselves with their use.                      |  |  |  |                                 |   |   |                                     |                          |  |
|  |  | -  |  |  |                                 |   |   |                                     |                          |  |
| Course Plan  |  |  |  |  |                                 |   |   |                                     |                          |  |

| 1st       | precauti+C3:C17c  | ons, etc.]   | of material  | Understand the and deformation   | definitions and o<br>1.  | concepts of stress   |  |  |
|-----------|---|--|--|--|--|--|--|--|
| 2nd       | Confirmation of th mechanics  | e fundamentals   | of material  | Understand the definitions and concepts of stress and deformation.   |  |  |  |  |
| 3rd       | Basic operation of  | 3D-CAD   |  | To understand the basic functions of a CAD system.   |  |  |  |  |
| 4th       | How to draw a sin structure.  | nple bar and ana   | lyze its   | CAD system.  |  |  |  |  |
| 5th       | Structural analysis drawing)  | s of a simple bar  | (3D-CAD  | To understand the role and basic functions of a CAD system   |  |  |  |  |
| 6th       | Structural analysis drawing and analy   | s of a simple bar<br>/sis procedure)   | (3D-CAD  | To understand the role and basic functions of a CAD system.  |  |  |  |  |
| 7th       | Structural analysis meaning of the ar   | s of a simple bar<br>alysis results)   | (display and   | To understand the role and basic functions of a CAD system.  |  |  |  |  |
| 8th       | Comparison with (<br>(mechanics of ma   | mechanical engin<br>terials)   | eering   | To understand the role and basic functions of a CAD system. To understand the meaning of allowable stresses and stress concentrations.   |  |  |  |  |
| 9th       | Data organization   | and reporting  |  | To understand the meaning of allowable stresses and stress concentrations.   |  |  |  |  |
| 10th      | Drawing of a bear   | n with complex s   | hapes  | To understand the role and basic functions of a CAD system.  |  |  |  |  |
| 11th      | Drawing of a bear   | n with complex s   | hapes  | To understand the role and basic functions of a CAD system.  |  |  |  |  |
| 12th      | Structural analysis   | s of complexly sh  | aped beams   | To understand the role and basic functions of a CAD system.  |  |  |  |  |
| 13th      | Display and discus  | ssion of analysis  | results  | To understand the meaning of allowable stress, safety factor, and stress concentration.  |  |  |  |  |
| 14th      |   |  | eering   | To understand the meaning of allowable stress, safety factor, and stress concentration.  |  |  |  |  |
| 15th      | Data organization   | and reporting  |  | To understand the meaning of allowable stresses, safety factor, and stress concentration.  |  |  |  |  |
| 16th      | Report generation   | l  |  | To understand the meaning of allowable stresses, safety factor, and stress concentration.  |  |  |  |  |
| hod and \ | Weight (%)  |  |  |  |  |  |  |  |
|           | Presentation  | Mutual<br>Evaluations<br>between<br>students   | Behavior   | Portfolio  | Other  | Total  |  |  |
| 00        | 0   | 0  | 0  | 0  | 0  | 100  |  |  |
|           | 0   | 0  | 0  | 0  | 0  | 0  |  |  |
| 00        | 0   | 0  | 0  | 0  | 0  | 100  |  |  |
|           | 0   | 0  | 0  | 0  | 0  | 0  |  |  |
| (         | 2nd<br>3rd<br>4th<br>5th<br>6th<br>7th<br>8th<br>9th<br>10th<br>11th<br>12th<br>13th<br>14th<br>15th<br>16th<br>thod and V<br>eport<br>00 | 1st precauti+C3:C17c   2nd Confirmation of the mechanics   3rd Basic operation of   4th How to draw a sinstructure.   5th Structural analysis drawing)   6th Structural analysis drawing and analysis drawing of the arrestructure.   7th Structural analysis drawing and analysis drawing of the arrestructure.   8th Comparison with function of the arrestructure.   9th Data organization   10th Drawing of a bear   11th Drawing of a bear   12th Structural analysis   13th Display and discus   14th Comparison with functions of main   15th Data organization   16th Report generation   16th Report generation   00 0   00 0 | 2nd Confirmation of the fundamentals of mechanics   3rd Basic operation of 3D-CAD   4th How to draw a simple bar and ana structure.   5th Structural analysis of a simple bar drawing)   6th Structural analysis of a simple bar drawing and analysis procedure)   7th Structural analysis of a simple bar meaning of the analysis results)   8th Comparison with mechanical engin (mechanics of materials)   9th Data organization and reporting   10th Drawing of a beam with complex st   11th Drawing of a beam with complex st   12th Structural analysis of complexly sh   13th Display and discussion of analysis of analysis of materials)   15th Data organization and reporting   16th Report generation   therethanics of materials) 15th   16th Report generation   chool and Weight (%) Mutual Evaluations between students   00 0 0   00 0 0 | 1st precauti + C3:C17ons, etc.]<br>Confirmation of the fundamentals of material<br>mechanics   2nd Confirmation of the fundamentals of material<br>mechanics   3rd Basic operation of 3D-CAD   4th How to draw a simple bar and analyze its<br>structure.   5th Structural analysis of a simple bar (3D-CAD<br>drawing)   6th Structural analysis of a simple bar (3D-CAD<br>drawing and analysis procedure)   7th Structural analysis of a simple bar (display and<br>meaning of the analysis results)   8th Comparison with mechanical engineering<br>(mechanics of materials)   9th Data organization and reporting   10th Drawing of a beam with complex shapes   11th Drawing of a beam with complex shapes   12th Structural analysis of complexly shaped beams   13th Display and discussion of analysis results   14th Comparison with mechanical engineering<br>(mechanics of materials)   15th Data organization and reporting   16th Report generation   thod and Weight (%) Mutual<br>Evaluations<br>between<br>students   00 0 0   00 0 0 | 1stprecauti+C3:C17ons, etc.]<br>Confirmation of the fundamentals of material<br>mechanicsUnderstand the<br>and deformation2ndConfirmation of the fundamentals of material<br>mechanicsUnderstand the<br>and deformation3rdBasic operation of 3D-CADTo understand the<br>system.4thHow to draw a simple bar and analyze its<br>structure.To understand the<br>drawing)6thStructural analysis of a simple bar (3D-CAD<br>drawing)To understand the<br>CAD system.6thStructural analysis of a simple bar (3D-CAD<br>drawing)To understand the<br>CAD system.7thStructural analysis of a simple bar (3D-CAD<br>drawing and analysis procedure)To understand the<br>CAD system.7thStructural analysis of a simple bar (display and<br>meaning of the analysis results)To understand the<br>CAD system.8thComparison with mechanical engineering<br>(mechanics of materials)To understand the<br>CAD system.9thData organization and reportingTo understand the<br>CAD system.10thDrawing of a beam with complex shapesTo understand the<br>CAD system.11thDrawing of a beam with complex shapesTo understand the<br>CAD system.12thStructural analysis of complexly shaped beamsTo understand the<br>cand strestand tractor, ar<br>To understand the<br>safety factor, ar14thComparison with mechanical engineering<br>(mechanics of materials)To understand the<br>and strestand the<br>safety factor, ar15thData organization and reportingTo understand the<br>safety factor, ar16thReport generationT | 1st precauti+C3:C17ons, etc.]<br>Confirmation of the fundamentals of material<br>mechanics Understand the definitions and i<br>and deformation.   2nd Confirmation of the fundamentals of material<br>mechanics Understand the definitions and i<br>and deformation.   3rd Basic operation of 3D-CAD To understand the basic functio<br>system.   4th How to draw a simple bar and analyze its<br>structure. To understand the role and basi<br>CAD system.   5th Structural analysis of a simple bar (3D-CAD To understand the role and basi<br>CAD system.   6th Structural analysis of a simple bar (3D-CAD To understand the role and basi<br>CAD system.   7th Structural analysis of a simple bar (display and<br>meaning of the analysis procedure) To understand the role and basi<br>CAD system.   8th Comparison with mechanical engineering<br>(mechanics of materials) To understand the role and basi<br>CAD system.   10th Drawing of a beam with complex shapes To understand the role and basi<br>CAD system.   11th Drawing of a beam with complex shapes To understand the role and basi<br>CAD system.   12th Structural analysis of complexly shaped beams To understand the role and basi<br>CAD system.   12th Display and discussion of analysis results To understand the meaning of a<br>safety factor, and stress concent<br>and stress concent<br>concent |  |  |