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| logo  College: Engineering Department: Civil Engineering  Course Title: **Structural Analysis 1**  Course No: **-**0901306  Credit Hours: 3 C.H.  Semester : Second - 2020/2021  **About The Course**  Course Title: **Structural Analysis 1**  Class : A  Course No: **-**0901306  Credit Hours: 3 C.H. Lecture Room: 409  Obligatory/ Optional : Obligatory  Text Book: 1. *Structural analysis, Russell Hibbeler , 8th edition, Prentice Hall.*  *2. Structural analysis, Aslam Kasamili, 4theitition. Cengage learning,*  *international. Cengage.com/region 2011, ISBN-13-978-0-495- 29567- 9.*  ISBN-10: 0-495-29567-1  **The Instructor**  Name : Dr. Shehdeh Mohammad Ghannam Title : C. E. Department Member  Office Tel :  Office No : 309 Office Hours: 9:30-11 Sunday &Tuesday and 11-12.30,  E. mail : sh.ghanam @ jpu.edu.jo ; E. mail : shehdeh\_ghannam @yahoo.com |

**Course Description**

*Introduction to the subject of structural analysis, classification of structures, loads types, analysis of statically determinate structures, determinacy and stability of planar structures, member forces in truss, internal loading in structures, shear and moment diagrams for beams and frames, influence lines for determinate structures, deflections , cables , frames, beam deflections .*

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| **Course Objectives** |

*Develop the skills to analyze the behavior and response of structures to various loads and constraints. To introduce civil engineering students to structural systems of determinate structures, emphasis is made on analysis of statically determinate structures, and to be able to determine internal forces in trusses, beams and frames. To enhance the students with knowledge of drawing shear force and bending moment diagrams and influence lines. Establish foundation knowledge and skills to different method of deflection calculations.*

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| **Learning Outcome** |

Making students aware of how language works to convey meaning as its basic function

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| **Course Outline and Time schedule** |

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| **Course Outline** | **Week** |
| Determinacy and Stability  Chapter 3.1 | 1st Week  ( 1/3- 4/3) |
| Determinacy and Stability  Chapter 3.2 | 2ed week  ( 8/3- 11/3) |
| Arches , cables and frames , Plane trusses  Chapter 3.5 and Chapter 3.8 | 3ed week  ( 15/3- 18/3) |
| Shear force diagram and B.M.D. for beams and frames  Chapter 4.5, 5.2 and 5.6 | 4th week  ( 22/3- 25/3) |
| **Exam 1** –Chapter 3 and Chapter 4 and Chapter 5 | 5th week  ( 29/3- 1/4) |
| Influence lines for beams and frames  Chapter 8.1 | 6th week  ( 5/4- 8/4) |
| Influence lines for beams and frames  Chapter 8.2 and 8.3 | 7th week  ( 12/4- 15/4) |
| Deflection of beams and frames by Integration method  Chapter 6.2 | 8th week  ( 19/4- 22/4) |
| Deflection of beams and frames by moment area method  Chapter 6.3 and 6.4 | 9th week  (26/4- 29 /4 ) |
| Deflection of beams by conjugate beam method  Chapter 6.5 and 6.6 | 10th week  ( 3/5 - 6/5 ) |
| **Exam 2** –Chapter 6 and Chapter 8 | 11th week  ( 10/5 – 13 /5 ) |
| Deflection of beams by virtual work method (least work)  Chapter 7.2 | 12th week  ( 17/5 - 20/5 ) |
| Deflection of beams by virtual work method (unit load)  Chapter 7.2 | 13th week  (24/5 - 27/5 ) |
| Final Exam | 14th week  ( 31/5 - 4/5 ) |
|  | 15thWeek  ( 7/6 - 10/6 ) |

**Presentation methods and techniques**

Methods of teaching varied according to the type of text, student and situation. The following techniques are usually used:

1. Lecturing with active participations.

Involve the civil engineering students in asking some questions related to the target topic of the course.

1. Problem solving.

Encourage the students to solve the given assignments and submit them at the definite time,

1. Cooperative learning.

By enhancing the students studying in groups .

1. Discussion.

To discuss the results and the answers of the target problems.

1. Learning by activities.

To encourage the students to some group activity.

1. Connecting students with different sources of information.

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| Sources of information and Instructional Aids |

* Computer soft wear … power point
* Using white board.

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| **Assessment Strategy and its tools** |

The assigned syllabus is assessed and evaluated

Through: feed back and the skills that are acquired by the students

The tools:

1. Formal (stage) evaluation

a) Class Participation 10%

b) Ist Exam 20%

c) 2nd Exam 20%

d) Group activity and Quizzes 10%

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| **Tool & Evaluation** |

Tests and quizzes are permanent tools & assessment, in addition to the activity file which contains curricular and the co-curricular activities, research, report papers and the active participation of the student in the lecture.

The following table clarifies the organization of the assessment schedule:

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| **Grade** | **Date** | **Test** |
| 20 | 22/3/2020 | First Exam |
| 20 | 26/4/2020 | 2nd Exam |
| 20 | Students should be notified about their marks | Activities & Participation  And Quizzes |
| 40 | 31/5 - 10/6/2019 | Final Exam |

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| **Activities and Instructional Assignment** |

1. Practical assignments to achieve the syllabus objectives.
2. Group Activity and demonstrations.

**Regulations to maintain the teaching-Learning Process in the Lecture:**

1- Regular attendance.

2- Respect of commencement and ending of the lecture time.

3- Positive relationship between student and teacher.

4- Commitment to present assignments on time.

5- High commitment during the lecture to avoid any kind of disturbance and distortion.

1. Allowed Absence percentages is ( 15%).

**References :**

* + - 1. *Theory of Structures, Timoshenko, S. P., and Young, D. H. 2nd Ed. McGraw-Hill New York, 1965.*
      2. *Structural analysis, Aslam Kasimali, 4theitition. Cengage learning, international*

*Cengage.com/region 2011, ISBN-13-978-0-495-29567-9. ISBN-10: 0-495-29567-1.*

*3. Structural Analysis, Mc-Cormac, J.C., Elling, R.E., Harber and Row, New York, 1988.*

*4. Elementary Structural Analysis, Norris, C.H. Wilbur, J.B., Utku S., 4th Ed.*

*McGraw-Hill New York, 1991.*

**Syllabus Classification**

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| **Objectives** | ***Learning outcome*** | ***Assessment tools*** |
| * ***Introduction*** *to the subject of structural analysis, Classification of structures, load types Free body diagrams, reactions..* | *To produce student in civil engineering to be familiar with different types of structures.* | *By using solved problems.*  *Power point and weight board.* |
| * ***Analysis of statically determinate structures****, determinacy and stability of planar structures Internal forces for determinate structures.* | *To develop the students skills in order to differentiate between structures related with determinacy and stability. By* | *By using solved problems.* |
| * ***Determination of the following features:*** * *Axial forces in Trusses.* * *Shear forces in Beams and Frames.* * *Bending in Beams, Frames and Arches.* * *Tension Cables .* | *To make the student to have capability in determining :*   * *Axial forces in Trusses.* * *Shear forces in Beams and Frames.* * *Bending in Beams, Frames and Arches.* * *Tension Cables .* | *Power point and weight board.* |
| * ***Influence Lines*** *for: Beams and Trusses.* | *To teach the student how to draw the Influence Lines for: Beams and Trusses.* | *By using solved problems.* |
| * ***Deflection*** *in Determinate Structures.* * *Virtual work method.* * *Strain Energy Method.* * *Double Integration Method.* * *Moment-Area Method.* * *Conjugate Beam Method* | *To improve the ability of the student to determine the Deflection in Determinate Structures.*   * *Virtual work method.* * *Strain Energy Method.* * *Double Integration Method.* * *Moment-Area Method.*   *Conjugate Beam Method* | *Power point and weight board.* |



***JARASH UNIVERSITY***

***CIVIL ENGINEERING DEPARTMENTCIVIL***

***1st semester 2018-2019***

***Course Syllabus***

***Structural Analysis 1*** *- 0901306(3 credit hours)*

***Description:*** *introduction to the subject of structural analysis, classification of structures, loads types, analysis of*

*statically determinate structures, determinacy and stability of planar structures, member forces in truss, internal*

*loading in structures, shear and moment diagrams for beams and frames, influence lines for determinate*

*structures, deflections , cables , frames, beam deflections .*

***Prerequisites:*** *Strength of Materials 0901205.*

***Text book:*** *"Structural Analysis: "8th Edition, by R.C. Hibbeler , ISBN 978-981-06-8713-7.*

***References:***

*Theory of Structures, Timoshenko, S. P., and Young, D. H. 2nd Ed. McGraw-Hill New York, 1965.*

*Structural analysis, Aslam Kasamili, 4theitition. Cengage learning, international. Cengage.com/region 2011, ISBN-13-978-0-495-29567-9. ISBN-10: 0-495-29567-1.*

*Structural Analysis, Mc-Cormac, J.C., Elling, R.E., Harber and Row, New York, 1988.*

*Elmentary Structural Analysis, Norris, C.H. Wilbur, J.B., Utku S., 4th Ed. McGraw-Hill New York, 1991.*

***Coordinator:*** *Dr. Shehdeh Ghannam.*

***Course Objectives:***

*Develop the skills to analyze the behavior and response of structures to various loads and constraints.*

*To introduce civil engineering students to structural systems of determinate structures, emphasis is made on*

*analysis of statically determinate structures, and to be able to determine internal forces in trusses, beams and*

*frames. To enhance the students with knowledge of drawing shear force and bending moment diagrams and*

*influence lines. Establish foundation knowledge and skills to different method of deflection calculations.*

***Topics Covered :***

* ***Introduction*** *to the subject of structural analysis, Classification of structures, load types Free body diagrams, reactions.*
* ***Analysis of statically determinate structures****, determinacy and stability of planar structures Internal forces*

*for determinate structures.*

* *Axial forces in Trusses.*
* *Shear forces in Beams and Frames.*
* *Bending in Beams, Frames and Arches.*
* *Tension Cables .*
* ***Influence Lines*** *for: Beams and Trusses.*
* ***Deflection*** *in Determinate Structures.*
* *Virtual work method.*
* *Strain Energy Method.*
* *Double Integration Method.*
* *Moment-Area Method.*
* *Conjugate Beam Method.*

***Class:*** *Two………minutes lectures per week on ……………….., (…………….).*

***How assessed:*** *- Home works, quizzes and class contribution………… 20%*

*- Tow-monthly class examinations (20% + 20%)……………………….. 30%*

*- Final Examination ………………………………….…………………...… 50%*