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h-index (Scopus):

8

Citations (Scopus):

160

Supervised MSc Theses

#	Thesis title	By	Date
1	Analysis and investigation of residual stresses in parts produced by 3D printing	Saeed Cheraghsahar Kiasaraee & Eslam Ranjbarnoodeh	August 2021
2	Reduction of Welding Induced Distortion Using Adaptive Control of Parameters	Mahdi Negahban & Eslam Ranjbarnoodeh	July 2021
3	predicting the quantity and type of intermetallic phases in joining of aluminum alloy to steel by using an interlayer	Emad Cheraghi Rizi & Eslam Ranjbarnoodeh	January 2021
4	Finite element modeling of residual stress in dissimilar welds of high strength steels	Amirreza Yaghoobi & Eslam Ranjbarnoodeh	February 2020
5	Investigation of microstructure and mechanical properties in dissimilar joint of aluminum alloys to austenitic stainless steels and Nickel base superalloy	Saeed Mohammadi & Eslam Ranjbarnoodeh	January 2020
6	Finite element modeling of heat transfer during resistance spot welding of haynes 230	Mohammad Ebadi Fallah & Eslam Ranjbarnoodeh	January 2020
7	Evaluation of the Effect of the repair welding on mechanical and microstructural properties of AISI 4140 Steel	Seyyed Ali Shahcheraghi & Eslam Ranjbarnoodeh	June 2019
8	Study on the effect of Repair Welding on microstructure and Mechanical Properties of 30ChN2MA Steel.	Reza Zarei & Eslam Ranjbarnoodeh	September 2018
9	Experimental investigation and finite element simulation of laser beam joining of metal to polymer	Reza Ghanavati & Eslam Ranjbarnoodeh	September 2018

10	Numerical analysis of stress corrosion cracking in Aluminum plates with pitting corrosion	Maghsdoud Soltani & Eslam Ranjbarnoodeh	June 2018
11	Optimization of welding sequence in Aluminum AA5083-H321 stiffened panel to reduce welding-induced deformation using finite element method.	Ali Shojaei & Eslam Ranjbarnoodeh	June 2018
12	Evaluation of cold hydrogen cracking resistance in Electrode E11018 by using the G-BOP test.	Arash Dehghan & Eslam Ranjbarnoodeh	February 2018
13	Finite element simulation of the effect of preheat on hydrogen induced cracking in welding of A517 steel	Siavash Shabani & Eslam Ranjbarnoodeh	February 2018
14	Finite element simulation of welding induced deformation in large structure using inherent deformation	Amirhossein Sadeghian & Eslam Ranjbarnoodeh	February 2018
15	Investigation stress-corrosion cracking of welded Aluminum plate with Friction Stir Welding	Fariba Soltani & Eslam Ranjbarnoodeh	February 2018
16	repair welding of hadfield Gx120Mn12 steel using SMAW process	Mahdi Sahranavard & Eslam Ranjbarnoodeh	January 2018
17	effect of process parameters on microstructural and mechanical properties in friction stir welding of dissimilar aluminum alloys	Gelare Fereyduni & Eslam Ranjbarnoodeh	January 2018
18	investigation of the effect of welding parameters and thickness on occurrence of cold crack in welding of A517 steel	Payam Khoshzaban & Eslam Ranjbarnoodeh	October 2017
19	Failure analysis of ethoxylate reactors coils of and proposing a solution for the problem	Sadegh Borjali & Eslam Ranjbarnoodeh	July 2017
20	finite element simulation of the effect of phase transformation induced plasticity on welding residual stress	Atefeh Neisi & Eslam Ranjbarnoodeh	February 2017
21	Finite Element Simulation of Material Flow during Friction Stir Welding	Amir Reza Talebzadeh & Eslam Ranjbarnoodeh	February 2017
22	Investigation of the effect of preheat, diameter and type of electrode on the microstructure and mechanical properties of SMAW welded X70 pipeline	Masoud Bastani & Eslam Ranjbarnoodeh	February 2017
23	Finite Element Simulation and Experimental Test of HAZ Softening during Welding of Aluminum alloy 7075	Mohammad Javad Pirbarjasteh & Eslam Ranjbarnoodeh	February 2017
24	Effect of Intensive Trailing Cooler on Prevention of Hot Cracking in Alluminum Welding	Abbas Mansoobi Amlashi & Eslam Ranjbarnoodeh	February 2017
25	simulation of effect of trailing heat sink on welding induced distortion in the dissimilar weld between carbon steel and stainless steel	Rahim Barati & Eslam Ranjbarnoodeh	December 2016
26	Designed for optimum welding respectively, to reduce the distortion of alloy Aluminium	Mohammad Sadegh Emadi & Eslam Ranjbarnoodeh	October 2016
27	Minimizatio of welding induced distortion using optimum operation sequence	Saeed Shadkam & Eslam Ranjbarnoodeh	October 2016
28	investigation of the effect of pin geometry on fatigue life of friction stir butt welded dissimilar AL alloys	Akbar Andarz & Eslam Ranjbarnoodeh	September 2016
29	Finite element simulation of heat transfer during G.T.A.W of high strength low alloy steel	Ali Moniri Pour & Eslam Ranjbarnoodeh	July 2016
30	Finite element simulation of in-service repair welding residual stresses	Moein Hoseinpoor & Eslam Ranjbarnoodeh	July 2016

31	finite element modeling of the effect of trailing heat sink on HAZ softening and welding induced distortion during TIG welding of AA 5083	Mohammadjavad Seifizade & Eslam Ranjbarnoodeh	July 2016
32	Finite element modeling of the effect of HAZ softening during TIG welding of AA5083 on welding distortion	Amin Haji Mohammadi & Eslam Ranjbarnoodeh	July 2016
33	Study on Mechanical Properties and Microstructural Analysis of Friction Stir Welded Joint of Titanium to Stainless Steel 304	Mostafa Mousazadeh & Eslam Ranjbarnoodeh	June 2016
34	Investigation on microstructure and mechanical properties of friction stir welding lap joints of aluminum and magnesium alloys	Ahmad Ghiasvand & Eslam Ranjbarnoodeh	January 2016
35	Heat transfer analysis of pulsed Nd:YAG laser welding of bimetallic low carbon steel and stainless steel	Zohreh Tajbakhshjou & Eslam Ranjbarnoodeh	December 2015
36	The effect of pin geometry on mechanical properties of St37 Steel friction stir welds	Mahdi Faragi & Eslam Ranjbarnoodeh	October 2015
37	prediction and mitigation of distortion in Ship panels	Amin Rezaei Estabraq & Eslam Ranjbarnoodeh	October 2015
38	Study of effect of weld volume on weld distortion in fillet joint	Cyrus Ansari Pour & Eslam Ranjbarnoodeh	August 2015
39	Finite element modeling of solidification cracking in welding in welding of Al-Si alloy	Pedram Tofighi & Eslam Ranjbarnoodeh	October 2014
40	Friction Stir Spot Welding of Advance High Strength Steels (AHSS	Omid Abedini & Eslam Ranjbarnoodeh	October 2014
41	Finite element modeling of the effect of trailing heat sink on welding distortion	Farshad Jafari & Eslam Ranjbarnoodeh	October 2014
42	Finite element modeling of the effect of trailing heat sink on the welding residual stress in plain carbon steel	Gholamreza Sadri Azad & Eslam Ranjbarnoodeh	September 2014
43	Finite element simulation of heat transfer in friction stir welding of steel St37	Mohammad Naghi Karimi & Eslam Ranjbarnoodeh	July 2014
44	Finite element simulation of heat transfer in electroslag welding process	Ali Goldar & Eslam Ranjbarnoodeh	May 2014
45	finite element modeling and experimental investigation of the effect of hydrostatic test on residual stress in boiler tubes weld	Daryoush Danyali & Eslam Ranjbarnoodeh	March 2014

Books

#	Title	Author(s)	Publisher country	publication date	version
Portal Records					
1	Welding deformation and residual stress prevention	Eslam Ranjbarnoodeh, Milad Mohammadi	Iran (Islamic Republic of)	March 2021	1
2	ANSYS for Welding Engineers	Eslam Ranjbarnoodeh	Iran (Islamic Republic of)	December 2017	1
3	Welding and Distortion Control	Eslam Ranjbarnoodeh,	Iran (Islamic Republic of)	August 2018	1

Journal Papers

Portal Records

- 1 Saleh Alaeibehmand, Eslam Ranjbarnoodeh, Seyed Ehsan Mirsalehi, "Joining mechanism in pinless FSSW of aluminum-steel with or without Zn and brass interlayer", MATERIALS CHARACTERIZATION, August 2021 Vol. 180, Num. 111400, Page 1-10, August 2021,
- 2 Saleh Alaeibehmand, Seyed Ehsan Mirsalehi, Eslam Ranjbarnoodeh, "Pinless FSSW of DP600/Zn/AA6061 dissimilar joints", Journal of Materials Research and Technology, August 2021 Vol. 15, Num. 0, Page 996-1006, August 2021,
- 3 Reza Ghanavati, Eslam Ranjbarnoodeh, Reza Shoja-Razavi, Gholamreza Pircheraghi, "Experimental and numerical investigation of the effect of laser input energy on the mechanical behavior of stainless steel and polyamide joint in the LAMP joining method", INTERNATIONAL JOURNAL OF ADVANCED MANUFACTURING TECHNOLOGY, March 2021 Vol. 113, Num. 11, Page 3585-3597, March 2021,
- 4 Masoud Alizadeh Shamsabadi, Pirooz Marashi, Eslam Ranjbarnoodeh, Reza Shoja-Razavi, "Laser cladding of Inconel 718 powder on a non-weldable substrate: Clad bead geometry-solidification cracking relationship", Journal of Manufacturing Processes, August 2020 Vol. 56, Num. 0, Page 54-62, August 2020,
- 5 Masoud Alizadeh Shamsabadi, Pirooz Marashi, Eslam Ranjbarnoodeh, Reza Shoja-Razavi, Jo?O Pedro Oliveira, "Prediction of solidification cracking by an empirical-statistical analysis for laser cladding of Inconel 718 powder on a non-weldable substrate", OPTICS AND LASER TECHNOLOGY, August 2020 Vol. 128, Num. 106244, Page 106244-106244, August 2020,
- 6 Masoud Alizadeh Shamsabadi, Pirooz Marashi, Eslam Ranjbarnoodeh, Reza Shoja Razavi, J. P. Oliveira, "Dissimilar laser cladding of Inconel 718 powder on A-286 substrate: Microstructural evolution", JOURNAL OF LASER APPLICATIONS, May 2020 Vol. 32, Num. 0, Page 1-9, May 2020,
- 7 Saeed Shadkam, Eslam Ranjbarnoodeh, Mehdi Iranmanesh, "Minimizing distortion caused by welding, by sequencing optimization in a large steel panel", Journal of Welding Science and Technology of Iran, February 2020 Vol. 5, Num. 2, Page 13-25, February 2020,
- 8 Omid Abedini, Mohsen Behroozi, Pirooz Marashi, Eslam Ranjbarnoodeh, Majid Pournavari, "Intercritical Heat Treatment Temperature Dependence of Mechanical Properties and Corrosion Resistance of Dual Phase Steel", MATERIALS RESEARCH-IBERO-AMERICAN JOURNAL OF MATERIALS, January 2019 Vol. 22, Num. 1, Page 1-10, January 2019,
- 9 Mirjavad Mirnajd Gerami, Eslam Ranjbarnoodeh, Mehdi Frajpour, "Simulation of Heat Transfer and Recrystallization in Aluminum Alloy AA 6070 by TIG Welding Method", Journal of Advanced Materials and Processing, October 2018 Vol. 5, Num. 4, Page 34-42, October 2018,
- 10 Ali Talebi Hanzaei, Pirooz Marashi, Eslam Ranjbarnoodeh, A. Hamdollahzadeh, "The Effect of Hydrogen Content and Welding Conditions on the Hydrogen Induced Cracking of the API X70 steel weld", , August 2018 Vol. 4, Num. 1, Page 29-41, August 2018,
- 11 Saeed Shadkam, Eslam Ranjbarnoodeh, Mehdi Iranmanesh, "Effect of sequence and stiffener shape on welding distortion of stiffened panel", JOURNAL OF CONSTRUCTIONAL STEEL RESEARCH, July 2018 Vol. 149, Num. 0, Page 41-52, July 2018,
- 12 Mehdi Farajpour, Eslam Ranjbarnoodeh, "Finite Element Simulation of Welding Distortion in Dissimilar Joint by Inherent Deformation Method", SOLDAGEM & INSPECAO, June 2018 Vol. 23, Num. 1, Page 60-72, June 2018,
- 13 Amin Rezaei Estabraq, Eslam Ranjbarnoodeh, Mehdi Iranmanesh, "Comparison of full 3D, shell/3D and inherent deformation numerical methods for prediction of out-of-plane welding-induced distortion", JOURNAL OF THE BRAZILIAN SOCIETY OF MECHANICAL SCIENCES AND ENGINEERING, May 2018 Vol. 0, Num. 0, Page 287-310, May 2018,
- 14 Ali Talebi Hanzaei, Pirooz Marashi, Eslam Ranjbarnoodeh, "The effect of hydrogen content and welding conditions on the hydrogen induced cracking of the API X70 steel weld", INTERNATIONAL JOURNAL OF HYDROGEN ENERGY, April 2018 Vol. 43, Num. 19, Page 9399-9407, April 2018,

- 15 Omid Abedini, Eslam Ranjbarnoodeh, Pirooz Marashi, "Effect of tool geometry and welding parameters on the microstructure and static strength of the friction stir welded DP780 dual phase steels", MATERIALI IN TEHNOLOGIJE, August 2017 Vol. 51, Num. 4, Page 687-694, August 2017,
- 16 Ali Reza Keshavarz, Eslam Ranjbarnoodeh, Manouchehr Fadavie, Mehdi Saeed Kiasat, "Investigation of the thickness effect on fatigue life calculation in a single bevel butt weld in A36 steel using experiment and its comparison with simulation results", , August 2017 Vol. 3, Num. 1, Page 62-75, August 2017,
- 17 Eslam Ranjbarnoodeh, Y.G. Anzabi, H. Sabet, "FINITE ELEMENT MODELING OF THE EFFECT OF WELDING PARAMETERS ON SOLIDIFICATION CRACKING OF AUSTENITIC STAINLESS STEEL 310", Metallurgical & Materials Engineering, January 2017 Vol. 22, Num. 4, Page 237-250, January 2017,
- 18 Cyrus Ansari Pour, Eslam Ranjbarnoodeh, Mehdi Iranmanesh, "Effect of geometrical variable and welding sequence on residual stresses and deformation in a 5083-H321 aluminum T joint", , December 2016 Vol. 2, Num. 2, Page 15-26, December 2016,
- 19 Daryoush Danyali, Eslam Ranjbarnoodeh, "NUMERICAL AND EXPERIMENTAL INVESTIGATION OF THE EFFECT OF HYDROSTATIC PRESSURE ON THE RESIDUAL STRESS IN BOILER-TUBE WELDS", MATERIALI IN TEHNOLOGIJE, October 2016 Vol. 50, Num. 5, Page 775-782, October 2016,
- 20 Amin Rezaei Estabraq, Eslam Ranjbarnoodeh, Mehdi Iranmanesh, "Finite element simulation of welding distortion in large structure", , January 2016 Vol. 1, Num. 1, Page 76-90, January 2016,
- 21 Eslam Ranjbarnoodeh, Majid Pouranvari, Mehdi Farajpour, "FINITE-ELEMENT MINIMIZATION OF THE WELDING DISTORTION OF DISSIMILAR JOINTS OF CARBON STEEL AND STAINLESS STEEL", MATERIALI IN TEHNOLOGIJE, March 2015 Vol. 49, Num. 2, Page 259-265, March 2015,
- 22 D. Danyali, Eslam Ranjbarnoodeh, "Numerical and experimental investigation of the residual stress distribution in shell-tube pressure vessels weld joint", , February 2015 Vol. 17, Num. 56, Page 28-38, February 2015,
- 23 Eslam Ranjbarnoodeh, Siamak Serajzadeh, Amir Hossein Kokabi, Alfons Fischer, "GRAIN SIZE DISTRIBUTION AFTER SIMILAR AND DISSIMILAR GAS TUNGSTEN ARC WELDING OF A FERRITIC STAINLESS STEEL", JOURNAL OF MINING AND METALLURGY SECTION B-METALLURGY, January 2015 Vol. 51, Num. 1, Page 61-66, January 2015,

Conference Papers











Portal Records

- 1 Ali Shojaei, Eslam Ranjbarnoodeh, Shahram Aalipour, "Optimization of the welding sequence in Al 5083-H321 stiffened panel to reduce the welding induced distortion using finite element method ", 3rd international conference on Mechanical and Aerospace Engineering, May 2018
- 2 Saeed Shadkam, Eslam Ranjbarnoodeh, Mehdi Iranmanesh, "Finite element modeling of the effect of various stiffeners to decrease distortion in SM490 Steel plate ", 18th National conference of welding and inspection and 7 th National conference of NDT, February 2018
- 3 Farshad Jafari, Eslam Ranjbarnoodeh, Seyed Ehsan Mirsalehi, Saeed Shadkam, "The finite element Simulation of effects of the trailing heat sink on the distortion caused by aluminum welding 3105 ", 18th National conference of welding and inspection and 7 th National conference of NDT, February 2018
- 4 Atefeh Neisi, Eslam Ranjbarnoodeh, Mehdi Iranmanesh, "Finite element modeling of the effect of metallurgical phase change , preheat on residual stress distribution in X70 steel weld ", 18th National conference of welding and inspection and 7 th National conference of NDT, February 2018
- 5 Sina Khadem Masjedi, Eslam Ranjbarnoodeh, Atefeh Neisi, "Investigation of hardness distribution structure of haz of A517 Steel in TIG welding ", 18th National conference of welding and inspection and 7 th National conference of NDT, February 2018
- 6 Eslam Ranjbarnoodeh, Amirhossein Sadeghian, Seyed Ehsan Mirsalehi, "Prediction of welding induced distortion in stiffened plate Al 5083 using inherent deformation method ", The international conference on Electrical, Computer and Mechanical Engineering of Iran, February 2018

- 7 Gelare Fereyduni, Ahmad Rahbar Ranji, Eslam Ranjbarnoodeh, "Investigating ", 19 th Marine conference, December 2017
- 8 Gelare Fereyduni, Ahmad Rahbar Ranji, Eslam Ranjbarnoodeh, "Review of ", 7th international offshore industries conference, May 2017
- 9 Amir Reza Talebzadeh, Mehdi Saeed Kiasat, Eslam Ranjbarnoodeh, S.Hosien Mousavizadegan, "Simulation of material flow in friction stir welding of AA6061 ", 2nd International Conference on Welding and Non Destructive Testing(ICWNDT 2016), December 2016
- 10 Masoud Bastani, Eslam Ranjbarnoodeh, Pirooz Marashi, Mohammad Abdolvand, "Investigation of the effect of E8010, E8018 electrodes, Size and Preheat on substructures and mechanical properties of SMAW welded X70 pipeline ", 5th international conference on materials engineering&metallurgy, November 2016
- 11 Mahdi Faragi, Mesbah Sayehbani, Eslam Ranjbarnoodeh, "Influence of tool travers speed on microstructural and mechanical properties of friction stir welded carbon steel. ", (The 18th Marine Industries Conference (MIC2016, October 2016
- 12 Moein Hoseinpoor, Eslam Ranjbarnoodeh, Seyed Ehsan Mirsalehi, "Numerical investigation of cold cracking in service welding ", International conference on researches in science and engineering, July 2016
- 13 Dariush Danyali, Eslam Ranjbarnoodeh, "Measuring the amount and distribution of heat in the welding of boiler tube connection using thermography as nondestructive test method ", 3RD Iranian international NDT conference, February 2016
- 14 Daryoush Danyali, Eslam Ranjbarnoodeh, "Numerical and experimental calculation of residual stress in welded tube boiler fire tube using stress relieving ", 16th National conference on welding and inspection, December 2015
- 15 Cyrus Ansari Pour, Eslam Ranjbarnoodeh, Mehdi Iranmanesh, "Finite element simulation of the effect of fillet weld surface geometry on welding residual stress and distortion in Aluminum 5083 stiffened plates ", 16th National conference on welding and inspection, December 2015
- 16 Zohreh Tajbakshjou, Eslam Ranjbarnoodeh, Ali Farzadi, Pirooz Marashi, "Finite element simulation of heat transfer during pulsed laser welding of dissimilar joint of low carbon steel to stainless steel ", 16th National conference on welding and inspection, December 2015
- 17 Pedram Tofighi, Eslam Ranjbarnoodeh, "Finite element simulation of solidification cracking in welding of aluminum alloy 6061 ", 16th National conference on welding and inspection, December 2015
- 18 Vahid Mansouri, Eslam Ranjbarnoodeh, Ahmad Rahbar Ranji, Kianoosh Zarrinnaghsh, "Investigation of hydrogen cracking susceptibility in microstructure of welded low alloy quenched and tempered steel A517 by controlling the preheat temperature ", 16th National conference on welding and inspection, December 2015
- 19 Ahmad Ghiasvand, Seyed Ehsan Mirsalehi, Eslam Ranjbarnoodeh, "Investigation of Single-pass and double-pass friction stir welding lap joints of aluminum and magnesium alloys ", 16th National conference on welding and inspection, December 2015
- 20 Amin Rezaei Estabraq, Eslam Ranjbarnoodeh, Esmaeel Masoudi, "finite element prediction of welding induced distortion and reducing the analysis time ", 17th marine industries conference, December 2015
- 21 Amin Rezaei Estabraq, Eslam Ranjbarnoodeh, "Prediction of out of plane distortion induced by welding in large structure using inherent deformation method ", 16th National conference on welding and inspection, December 2015
- 22 Mahdi Faragi, Eslam Ranjbarnoodeh, Mesbah Sayehbani, "Investigation of the effects of travel speed and pin geometry on mechanical properties and microstructure of steel st37-2 welded by friction stir welding ", 16th National conference on welding and inspection, December 2015
- 23 Eslam Ranjbarnoodeh, Mehdi Barazandeh Maovaghar, Kahlil Gheisari, "Finite element simulation of the effect of welding parameters on HAZ softening during welding of AA3105-H14 ", 4th international engineering material & metallurgy conference, November 2015
- 24 Ahmad Ghiasvand, Seyed Ehsan Mirsalehi, Eslam Ranjbarnoodeh, "Friction stir welding lap joint of 5754 aluminum alloy and AZ31 magnesium alloy ", 4th International Engineering Materials & Metallurgy Conference, November 2015
- 25 Daryoush Danyali, Eslam Ranjbarnoodeh, "The effect of hydro test on residual stresses in welding of fired boiler tubes ", 4th international engineering material & metallurgy conference, November 2015

- 26 Vahid Mansouri, Eslam Ranjbarnoodeh, Ahmad Rahbar Ranji, Kianoush Zarrin Naghsh, "investigation of the effect of preheating on the tension required for cold cracks in welded sections of quenched and tempered low alloy steel A517 ", 4th international engineering material & metallurgy conference, November 2015
- 27 Cyrus Ansari Pour, Eslam Ranjbarnoodeh, Mehdi Iranmanesh, "Investigation of welding sequence on residual stress and distortion in stiffened plate of Aluminum 5083 ", 4th international engineering material & metallurgy conference, November 2015
- 28 Eslam Ranjbarnoodeh, Daryoush Danyali, "Numerical and experimental investigation of residual stress in tube-shell weld ", 3RD International Engineering Materials & Metallurgy Conference, November 2014
- 29 Mohammad Shakooryan Fard, Eslam Ranjbarnoodeh, Mesbah Sayehbani, Mohmmad Ali Mirzaie, "EFFECTIVE FACTORS ON WELDING OF PLAIN CARBON STEELS USING FRICTION STIR WELDING ", symposium steel 1392, February 2014

Taught Courses

#	Course title	Description	Headlines	Date
1	Mechanics of Materials	Familiarity with types of stress, strain and Ability to apply fundamental equations to determine strength of engineering materials under different loads		Fall 2021
2	Introduction to Manufacturing Processes	Introduction to Manufacturing Processes		Fall 2021
3	Mechanics of Materials	Familiarity with types of stress, strain and Ability to apply fundamental equations to determine strength of engineering materials under different loads		Fall 2021
4	Introduction to Manufacturing Processes	Introduction to Manufacturing Processes		Spring 2021
5	Errors in Materials Measurement & Research	Errors in Materials Measurement & Research		Spring 2021
6	Welding Quality Control	Inspection of welded structures- Quality Control in Welding		Spring 2021
7	Introduction to Manufacturing Processes	Introduction to Manufacturing Processes		Fall 2020
8	Errors in Materials Measurement & Research	Errors in Materials Measurement & Research		Fall 2020
9	Mechanics of Solids & Material Science	Familiarity with types of stress, strain and Ability to apply fundamental equations to determine strength of engineering materials under different loads		Fall 2020
10	Mechanics of Materials	Familiarity with types of stress, strain and Ability to apply fundamental equations to determine strength of engineering materials under different loads		Fall 2020

