

Government of Pakistan

National Vocational and Technical Training Commission

Prime Minister's Hunarmand Pakistan Program

"Skill for All"



Course Contents / Lesson Plan

Course Title: Certificate in CAD, CAE & Digital Manufacturing for Product Design

Duration: 6 Months

Course Details / Description & Preliminaries

Course Title	CAD, CAE & Digital Manufacturing for Product Design
Instructor Name	
Objective of Course	Employable skills and hands on practice for Artificial Intelligence and Robotics Today's dominant technology trends—cloud computing, mobile technology, social connection, and collaboration—are driving businesses and consumers alike to explore profoundly different ways to design, make, and use things. This kind of industry transformation has happened before, but the pace of change is now much faster. In today's competitive landscape, anyone can be an innovator—and it's all about who innovates first. The future of making things lies with digital manufacturing—a process that radically changes how things are made. Digital manufacturing drives collaboration and the exchange of data across the entire product lifecycle from design, testing, and manufacture to the sourcing of materials, distribution, and customer use. This course covers of computer aided design and computer aided engineering with software to analyze and design the product in virtual environment. It aims at inculcating wide array of skill-set range in the students so that they can become contributor to the indigenous design and development of solutions by designing all the major systems, starting from basics of designing to analysis, with relevance of national and international industry needs. This course primarily aimed at equipping the trainees to perform commercially in a market space in independent capacity or as a member of a team. The course therefore is designed to impart not only technical skills but also soft skills (i.e. interpersonal/communication skills; personal grooming of the trainees etc.) as well as entrepreneurial skills (i.e. marketing skills; free lancing etc.). The course also seeks to inculcate work ethics to foster better citizenship in general and improve the image of Pakistani work force in particular. The primary objective of this course is to build capacity of trainees in following core areas of CAD/ CAE for digital manufacturing. These include: 1. Apply CAD and CAE software tools to engineering design and analysis. 2. Create 2D sketches. 3. Model basic and detailed 3D parts. 4. Document and generate technical drawings and views for manufacturing. 5. Create simulation studies to analyze the structural integrity of a design before it is manufactured. 6. Calculate design optimization parameters.

Main Expectations:

In short, the course under reference should be delivered by professional instructors in such a robust hands- on manner that the trainees are comfortably able to employ their skills for earning money (through wage/self-employment) at its conclusion.

This course thus clearly goes beyond the domain of the traditional training practices in vogue and underscores an expectation that a market centric approach will be adopted as the main driving force while delivering it. The instructors should therefore be experienced enough to be able to identify the training needs for the possible market roles available out there. Moreover, they should also know the strengths and weaknesses of each individual trainee to prepare them for such market roles during/after the training.

- i. Specially designed practical tasks to be performed by the trainees have been included in the Annexure-I to this document. The record of all tasks performed individually or in groups must be preserved by the management of the training Institute clearly labeling name, trade, session etc so that these are ready to be physically inspected/verified through monitoring visits from time to time. The weekly distribution of tasks has also been indicated in the weekly lesson plan given in this document.
- ii. In order to materialize the main expectations, a special module on Job Search & Entrepreneurial Skills has been included in the later part of this course (5th & 6th month) through which, the trainees will be made aware of the Job search techniques in the local as well as international job markets (Gulf countries). Awareness around the visa process and immigration laws of the most favoured labour destination countries also forms a part of this module. Moreover, the trainees would also be encouraged to venture into self-employment and exposed to the main requirements in this regard. It is also expected that a sense of civic duties/roles and responsibilities will also be inculcated in the trainees to make them responsible citizens of the country.
- iii. A module on Work Place Ethics has also been included to highlight the importance of good and positive behavior at work place in the line with the best practices elsewhere in the world. An outline of such qualities has been given in the Appendix to this document. Its importance should be conveyed in a format that is attractive and interesting for the trainees such as through PPT slides +short video documentaries. Needless to say that if the training provider puts his heart and soul into these otherwise non-technical components, the image of Pakistani workforce would undergo a positive transformation in the local as well as international job markets.

In order to maintain interest and motivation of the trainees throughout the course, modern techniques such as:

- Motivational Lectures
- Success Stories
- Case Studies

These techniques would be employed as an additional training tool wherever possible (these are explained in the subsequent section on Training Methodology).

Lastly, evaluation of the competencies acquired by the trainees will be done objectively at various stages of the training and proper record of the same will be maintained. Suffice to say that for such evaluations, practical tasks would be designed by the training providers to gauge the problem solving abilities of the trainees.

(i) Motivational Lectures

The proposed methodology for the training under reference employs motivation as a tool. Hence besides the purely technical content, a trainer is required to include elements of motivation in his/her lecture. To inspire the trainees to utilize the training opportunity to the full and strive towards professional excellence. Motivational lectures may also include general topics such as the importance of moral values and civic role & responsibilities as a Pakistani. A motivational lecture should be delivered with enough zeal to produce a deep impact on the trainees. It may comprise of the following:

- Clear Purpose to convey message to trainees effectively.
- Personal Story to quote as an example to follow.
- Trainees Fit so that the situation is actionable by trainees and not represent a just idealism.
- Ending Points to persuade the trainees on changing themselves.

A good motivational lecture should help drive creativity, curiosity and spark the desire needed for trainees to want to learn more.

Impact of a successful motivational strategy is amongst others commonly visible in increased class participation ratios. It increases the trainees' willingness to be engaged on the practical tasks for longer time without boredom and loss of interest because they can clearly see in their mind's eye where their hard work would take them in short (1-3 years); medium (3 -10 years) and long term (more than 10 years).

As this tool is expected that the training providers would make arrangements for regular well planned motivational lectures as part of a coordinated strategy interspersed throughout the training period as suggested in the weekly lesson plans in this document.

(ii) Success Stories

Another effective way of motivating the trainees is by means of Success Stories. Its inclusion in the weekly lesson plan at regular intervals has been recommended till the end of the training.

A success story may be disseminated orally, through a presentation or by means of a video/documentary of someone that has risen to fortune, acclaim, or brilliant achievement. A success story shows how a person achieved his goal through hard work, dedication and devotion. An inspiring success story contains compelling and significant facts articulated clearly and easily comprehensible words. Moreover, it is

	helpful if it is assumed that the reader/listener knows nothing of what is being revealed. Optimum impact is created when the story is revealed in the form of:- • Directly in person (At least 2-3 cases must be arranged by the training institute) • Through an audio/ videotaped message (2-3 high quality videos must be arranged by the training institute) It is expected that the training provider would collect relevant high quality success stories for inclusion in the training as suggested in the weekly lesson plan given in this document. Suggestive structure and sequence of a sample success story and its various shapes can be seen at annexure III. (iii) Case Studies Where a situation allows, case studies can also be presented to the trainees to widen their understanding of the real life specific problem/situation and to explore the solutions. In simple terms, the case study method of teaching uses a real life case example/a typical case to demonstrate a phenomenon in action and explain theoretical as well as practical aspects of the knowledge related to the same. It is an effective way to help the trainees comprehend in depth both the theoretical and practical aspects of the complex phenomenon in depth with ease. Case teaching can also stimulate the trainees to participate in discussions and thereby boost their confidence. It also makes class room atmosphere interesting thus maintaining the trainee interest in training till the end of the course. Depending on suitability to the trade, the weekly lesson plan in this document may suggest case studies to be presented to the trainees. The trainer may adopt a power point presentation or video format for such case studies whichever is deemed suitable but it's important that only those cases are selected that are relevant and of a learning value. The Trainees should be required and supervised to carefully analyze the cases. For the purpose they must be encouraged to inquire and collect specific information / data, actively participate in the discussions and intended solutions of the problem / situation. Case studies can be implemented in the following ways: - A good quality trade specific documentary (At least 2-3 documentaries must be arranged by the training institute) Health & Safety case studies (2 cases regarding safety and industrial accidents must be arranged by the training institute) Field visits(At least one visit to a trade specific major industry/ site must be arranged by the training institute)
Entry level of trainees	Since intake level is Intermediate (Pre-Engineering) and so expectations from the trainees are: • To have knowledge of basic computer system

	• To understand the use of internet and browsing. • To have knowledge of using social media platforms. • To have the knowledge of emailing. • To have the knowledge basic mathematical algebra. • To have the knowledge of basic physics concepts.
Learning Outcome of the Course	Upon completion of this course, the trainees will be able to: 1. Ability to understand Design intent in product, for applying in Manufacturing. 2. Hands on experience to develop Solid Modeling and techniques. 3. Capable to apply concepts of parametric modeling with 3D surfacing and Understand geometric constrains. 4. Capable to apply concepts to develop drawings and techniques to apply GD&T (Geometric Dimensioning and Tolerances). 5. Able to understand and make Template drawings, Dimensioning methodology, 2D Orthographic Projections, Section and Auxiliary Views 6. Manufacturing methodology of product. 7. Ability to generate cutting tool path and G&M codes file.
Course Execution Plan	Total Duration of Course: 6 Months (26 Weeks)
	Class Hours: 4 Hours per day
	Theory: 20% Practical: 80%
	Weekly Hours: 24 Hours Per week
	Total Contact Hours: 600 Hours
Companies offering Jobs in the respective trade	1. Honda 2. Toyota 3. TUSDEC 4. GTDMC 5. KTDMC 6. BOSS 7. NDC (National Development Complex) 8. KotSteel Pvt Ltd 9. ZNJ hygienic 10. Pak Fan 11. AMTC 12. Super Asia 13. UAE CNC Industries 14. Magna Ind., 15. Alba Engineering Company 16. Anwar Khawaja Composites 17. Azeem Engineering 18. Boss Plastic 19. Fatima Fertilizer 20. Chenab Eng works & foundry 21. Qadbros Engineering (pvt) Ltd. 22. Panther Tyres & Tubes 23. F.T.M.M 24. Green Land Engineering 25. PAEC 26. Pak Fan (Wahid Ind) 27. KSA CNC Industries

	28. OGDCL 29. Darson Industries (Pvt) Ltd. 30. Diamond Engineering Works 31. Gondal Precasting Industries 32. K.B. International 33. Master Poly Plastic 34. Mughal Engineering, Gujranwala 35. Tariq Engineering Products 36. Tetra Link Technologies 37. Indus Plastic 38. Packages Intl 39. Manan Shahid Co. 40. Climax 41. Qatar CNC Industries 42. SNGPL 43. HMC 44. SABRO Islamabad 45. Shahsons Pakistan (Pvt) Ltd. 46. Services Industries Ltd 47. Spell Lahore 48. Slandered Engineering 49. Syed Engineering 50. Faisal Sanitary 51. KotSteel Pvt Ltd 52. Tetra Link Technologies 53. Omar Jibran Co., 54. FICO Co., 55. Oman CNC Industries 56. Pakistan Railways
Job Opportunities	In recent decades, computer-aided design (CAD) has permeated the design and engineering fields following are the opportunities you can go after completing this course: • Product Designer • Mechanical Drafter • Commercial and Industrial Designers • Product developer • CAD/ CAE Designer • Digital Product Analyzer
No of Students	25
Learning Place	Classroom / Lab
Instructional Resources	• CAD CAE TUTORIALS • GrabCAD

WEEKLY SCHEDULE OF TRAINING

Scheduled Week	Module Title	Learning units	Remarks
Week 1	Introduction	• Motivational lecture (<i>For further detail please see Page No:64</i>) • Course introduction • Success stories • Job market • Course applications • Institute/work ethics • Introduction to product designing • Design Innovation Practices • Foundational Concepts • Introduction to Finite element analysis (FEA) • Introduction to Computational fluid dynamics (CFD) • Introduction to multi-disciplinary design optimization (MDO)) • Introduction to 3D and 2D design. • Workplace ethics (<i>See details at annexure II</i>)	• Home Assignment
Week 2	Introduction to Engineering Drawing	• Introduction to Basic Engineering Drawing • Basic Measurements (scales) • Difference between Absolute and Increment System • Isometric Drawings, Pictorial Drawing, Orthographic Views • First Angle of Projection and Third Angle of Projection, Sectioning and Dimensioning • Isometric Drawings, Pictorial Drawing, Orthographic Views	• Task 1 • Task 2
Week 3	Design and Software Interface References and Parameterization	• Introduction of CAD/CAE and digital manufacturing for product design • Introduction of CAD/CAE software's • Principles and Elements of a Design. • Getting familiar with user interface of CAD/CAE software.	• Task 3 • Home Assignment
		• Introduction to Datum (Lines, Planes, points etc.) • Coordinate systems. • Parametric modeling and Associativity. • Understand the basics of sketcher environment. • Create sketch geometry.	• Task 4 • Task 5 • Home Assignment
Week 4	Sketch Geometry	• Analyze sketch geometry. • Edit existing profiles. • Dimension sketch geometry and modify it with constraints. • Introduction of parametric solid modeling • Create and manage a solid model.	• Task 6 • Home Assignment

		• Modify the solid models. • Transform the solid model.	
Week 5	Constraint	• Dressing up the solid model • Constraint management.	• Task 7 • Home Assignment
Week 6	Drafting	• Generate drawings from part model. • Ballooning and Bill of material generation • GD&T in drawing. • Symbol understanding like surface finish etc.	• Task 8 • Home Assignment
Week7	Surface and Solid Modeling	• Manage sketches within a 3D environment. • Difference between solid and surface modeling. • Create and manage a surface model.	• Task 9 • Home Assignment
Week 8	Surface Management	• Dressing up the surface model. • Modify the surface models.	• Task 10 • Home Assignment
Week 9	Wireframes Geometry	• Creating the wireframes. • Transform the surface model. • Constraint management.	• Task 11 • Home Assignment
Week 10	Jig an Fixtures	• Introduction to tooling development • (Dies, Molds, Jigs and fixture) through assembly module. • Design parts in the context of product manufacturing	• Task 12 • Home Assignment
Week 11	Introduction to Assembly	• Introduction to assembly and its constrains • Top-Down and Bottom-Up Assemblies. • Degrees of freedom.	• Task 13 • Home Assignment
Week 12	Geometric Dimensioning and Tolerances	• GD&T for assembly. • Re-use existing data to complete assemblies. • Manage relationships between assembled parts	• Task 14 • Home Assignment
Week 13	Visualization and Rendering	• Analyze and annotate your design. • Visualization techniques	• Task 15 • Home Assignment
Week 14	Introduction to Engineering Drawing	• Introduction to Basic Engineering Drawing • Basic Measurements (scales) • Difference between Absolute and Increment System • Isometric Drawings, Pictorial Drawing, Orthographic Views • First Angle of Projection and Third Angle of Projection, Sectioning and Dimensioning • Isometric Drawings, Pictorial Drawing, Orthographic Views	• Task 16 • Task 17 • Task 18 • Task 19 • Task19 • Task 20 • Task 21 • Task 22 • Task 23 • Task 24 • Home Assignment
Week 15	Mid-Term Assignment/Exam		

Week 16	Computational Fluid Dynamics (CFD)	- Fundamentals of CFD - Meshing of CFD - CFD Analysis - Types of CFD analysis - Incompressible flow analysis	Task 25 Home Assignment
Week 17			Task 26 Home Assignment
Week 18			Task 27 Home Assignment
Week 19	Finite Element Analysis for Structural Mechanics (FEA)	- Fundamentals of FEA - Meshing of FEA	Task 28 Home Assignment
Week 20		- FEA Analysis - Types of FEA analysis	Task 29 Home Assignment
Week 21	Employable Project/Assignment (6 weeks (i.e. 21-26) in addition of regular classes.	- Guidelines to the Trainees for selection of students' employable project like final year project (FYP) - Assign Independent project to each Trainee - A project based on trainee's aptitude and acquired skills. - Designed by keeping in view the emerging trends in the local market as well as across the globe. - The project idea may be based on Entrepreneur. - Leading to the successful employment. - The duration of the project will be 6 weeks - Ideas may be generated via different sites such as: https://1000projects.org/ https://nevonprojects.com/ https://www.freestudentprojects.com/ https://technofizi.net/best-computer-science-and-engineering-cse-project-topics-ideas-for-students/ - Project can be picked from the following list: - Rocker Boogie - Solar Panel Cleaning System Using Raspberry Pi - Real Time Object Detection System Using Pi - Arduino Color Sorter - Home Automation System - Intelligent Line Following Robot - Intelligent Obstacle Avoiding Robot - Soccer Bot - Artificial Intelligence Voice Controlled Robot - AI Based Pick and Place Robotic Arm - AI Based Self-Balancing Bot - Smart Traffic Light Management System Based on Vehicle Density Using Raspberry Pi - Smart Energy Meter for Power Theft Detection Using Raspberry Pi	

		○ Color Tracking Robot ○ AI Based Personal Assistant Board Using Pi ○ Quad Copter ○ Raspberry Pi Temperature & Humidity Network Monitor ○ Weather Condition and Forecasting Using Weather Cloud Using Raspberry Pi ○ Plant Watering System Based on Soil Moisture Using Raspberry Pi ○ GPS Based Location Detection Using Raspberry Pi ● Final viva/assessment will be conducted on project assignments. ● At the end of session, the project will be presented in skills competition ● The skill competition will be conducted on zonal, regional and National level. ● The project will be presented in front of Industrialists for commercialization ● The best business idea will be placed in NAVTTC business incubation center for commercialization. ----- OR On job training for 2 weeks: ● Aims to provide 2 weeks industrial training to the Trainees as part of overall training program ● Ideal for the manufacturing trades ● As an alternate to the projects that involve expensive equipment ● Focuses on increasing Trainee's motivation, productivity, efficiency and quick learning approach.	
Week 22	Finite Element Analysis for Structural Mechanics (FEA)	● Linear static Analysis ● Thermal Analysis	● Task 113
Week 23	Simulation Analysis	● Applying blank/work piece to required CAD drawings ● Preprocessing of tool path ● Parameters setting ● Step over, depth of cut, feed rate, RPM, selection of tool diameter and types etc. ● Parameter Settings of non-cutting moves ● Setting of Rapid moves and tool engage method. ● Basic Practical Training	● Task 114
Week 24	Simulation modal frequencies	● Simulating tool path in software ● Collision detection, gouge checking	● Home assignment

Week 25	Design Optimization	• Create simulation studies to analyze the structural integrity of a design before it is manufactured	• Home assignment
Week 26	Entrepreneurship and Final Assessment in project	• Job Market Searching • Self-employment • Freelancing sites • Introduction • Fundamentals of Business Development • Entrepreneurship • Startup Funding • Business Incubation and Acceleration • Business Value Statement • Business Model Canvas • Sales and Marketing Strategies • How to Reach Customers and Engage CxOs • Stakeholders Power Grid • RACI Model, SWOT Analysis, PEST Analysis • SMART Objectives • OKRs • Cost Management (OPEX, CAPEX, ROCE etc.) • Final Assessment • Success story (<i>For further detail please see Page No: 5 and Annexure-III at the end</i>).	• Home assignment

1.1 List of Machinery / Equipment

SNo.	Name of item as per curriculum	Quantity physically available at the training location
1.	Desktop Computers	25
2.	Measuring Tools	30
3.	Laser Printer	30

1.2 Software List

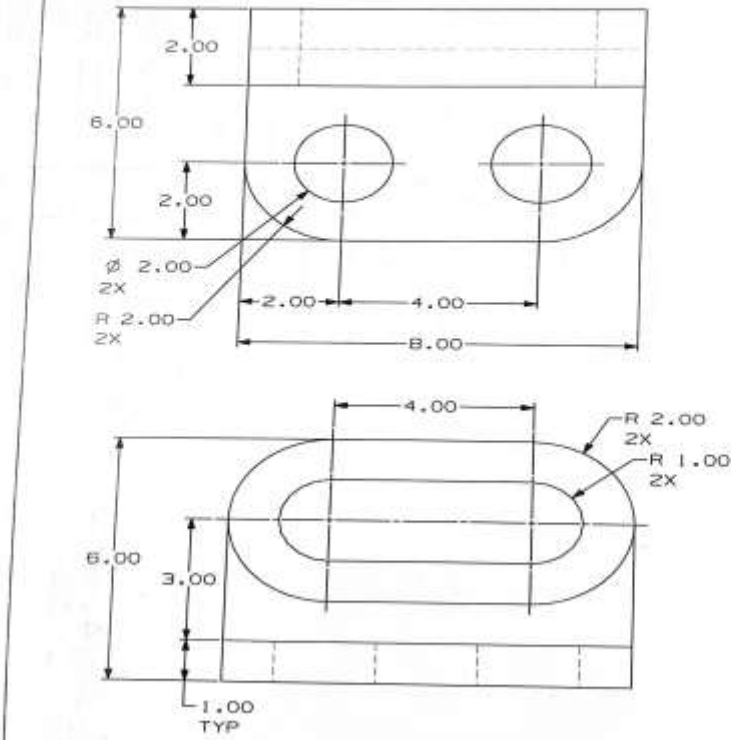
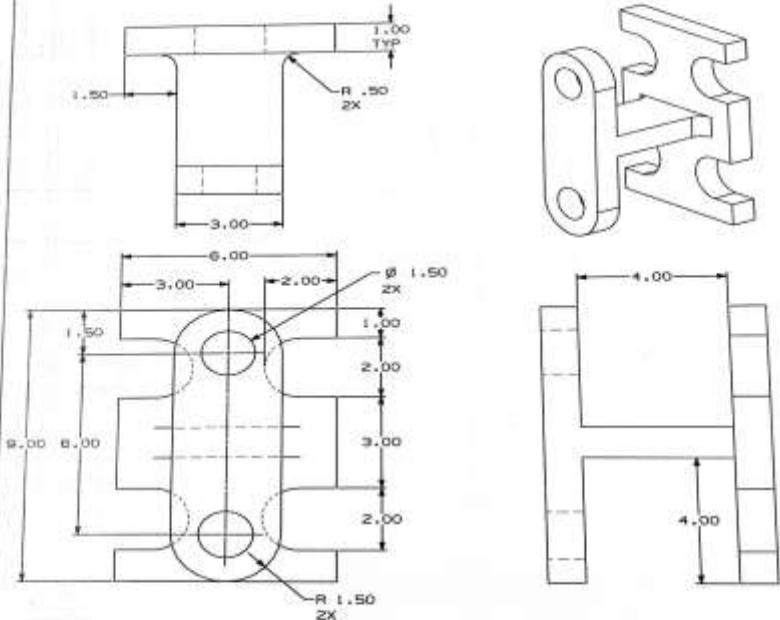
SNo.	Software Name
1.	Solidoworks
2.	ANSYS

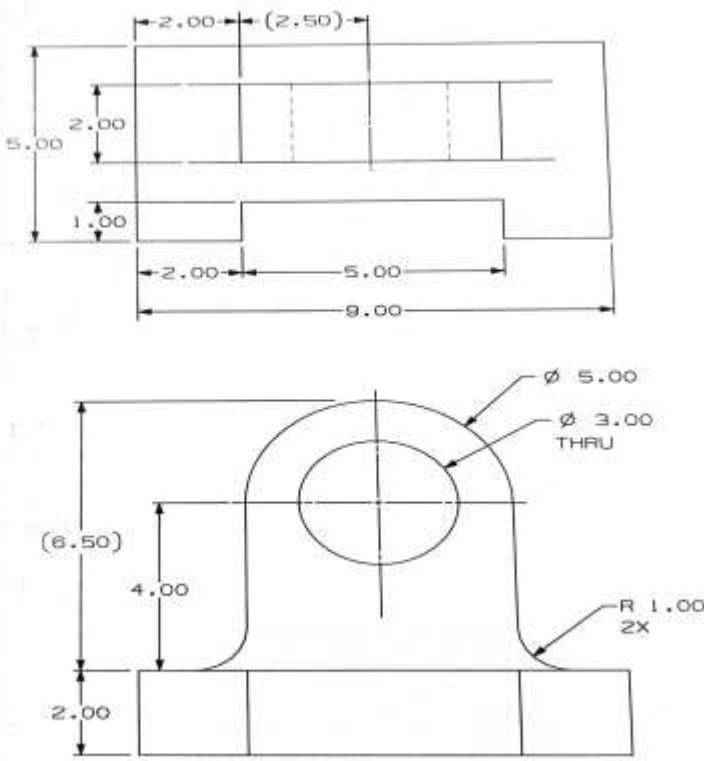
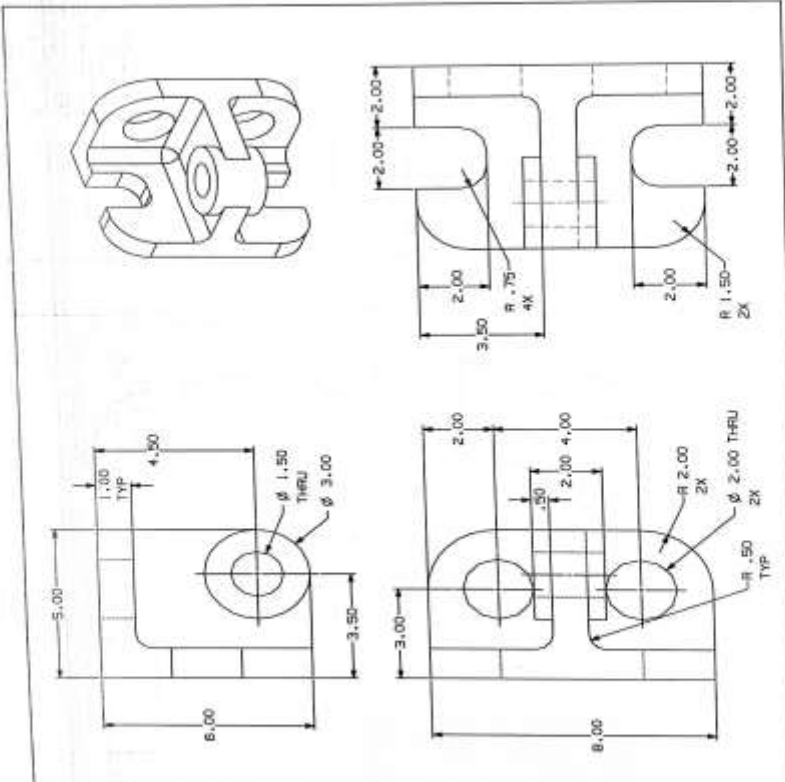
Annexure-I:

Tasks For Certificate in Artificial Intelligence for Robotics

Task No.	Task	Description	Week
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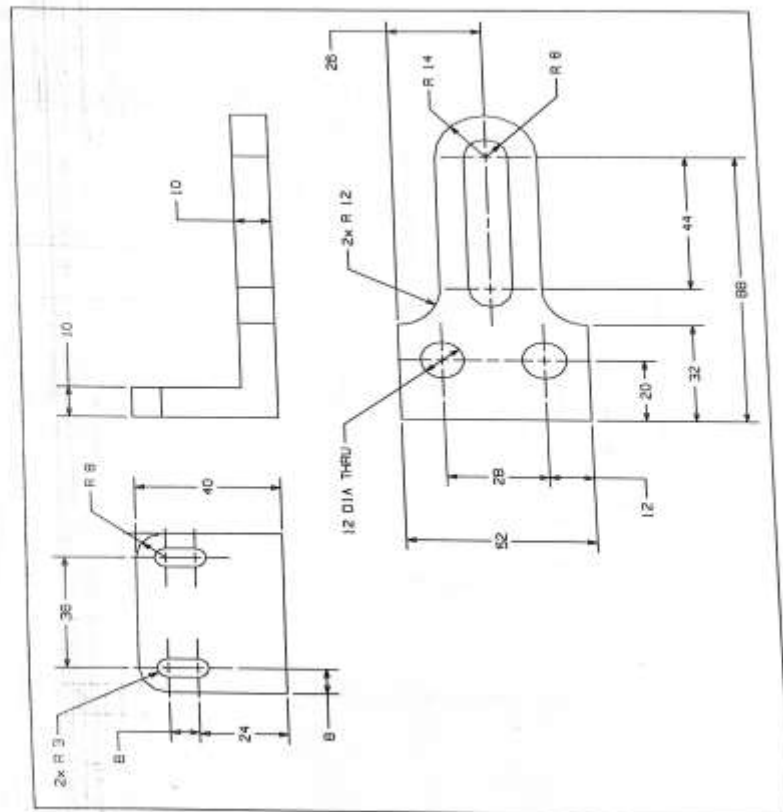
3.	Draw the object according to the given drawing		
4.	Draw the object according to the given drawing		Week -2

5.	Draw the object according to the given drawing		Week -3
6.	Draw the object according to the given drawing		Week -4

7.	Draw the object according to the given drawing		Week -5
8.	Draw the object according to the given drawing		Week -6

9.

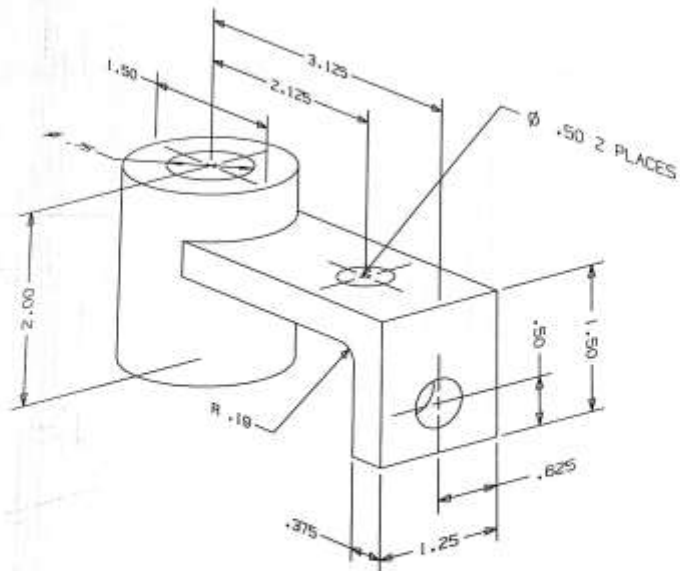
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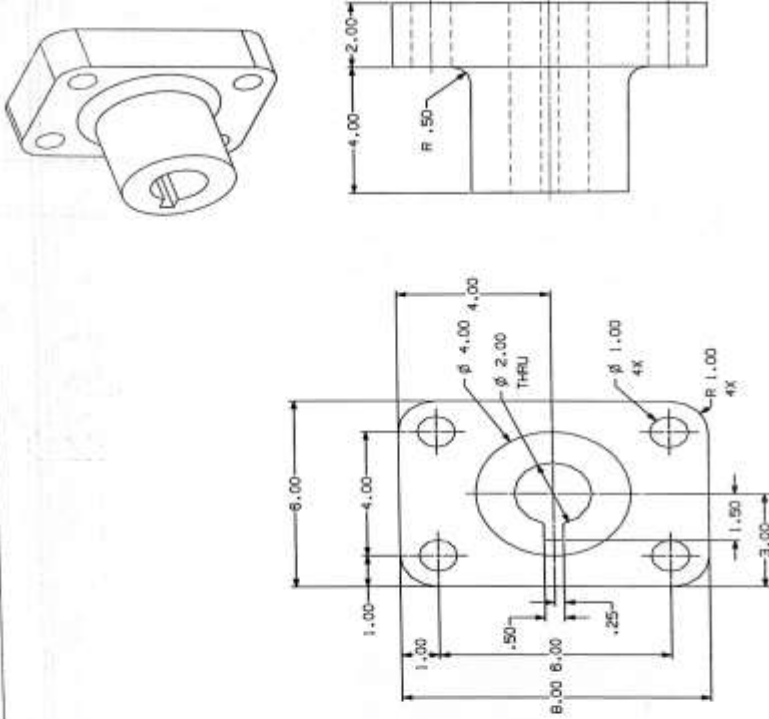
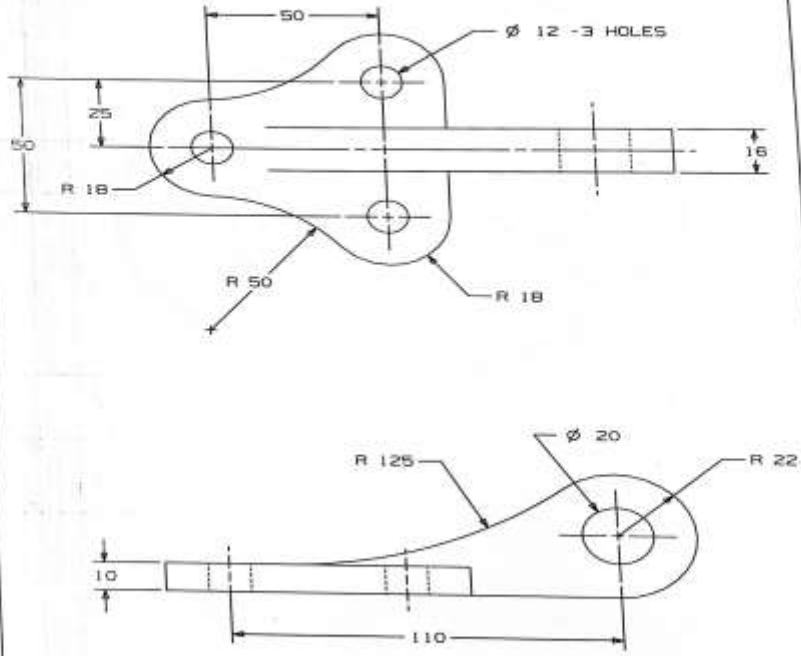
Week -7

10.

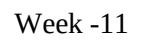
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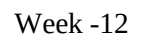
Week -8

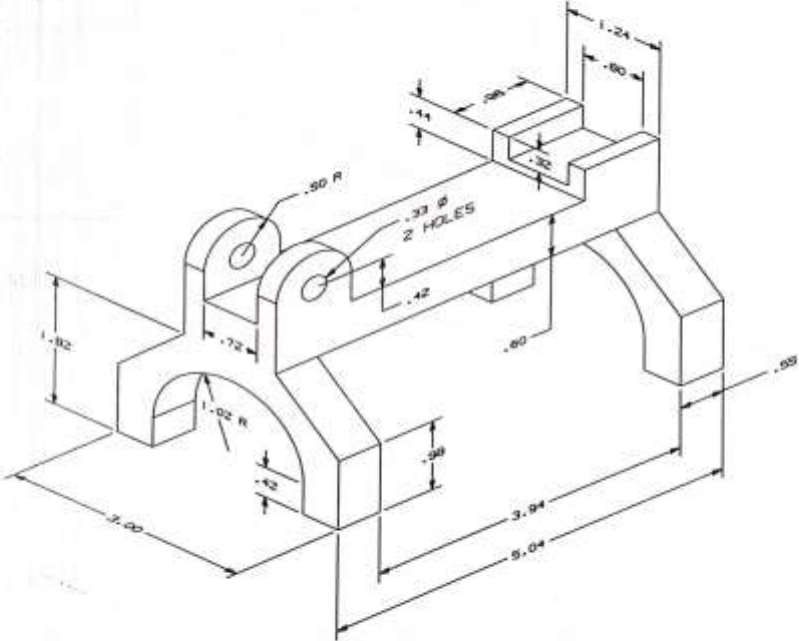
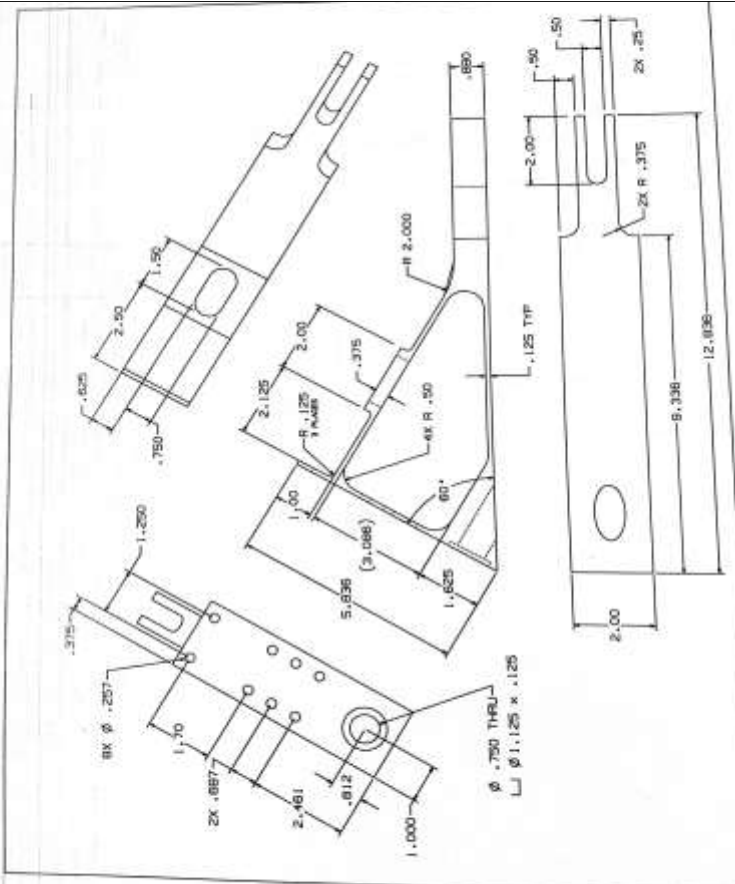
11.	Draw the object according to the given drawing		Week -10
12.	Draw the object according to the given drawing		Week -10

Draw the object according to the given drawing

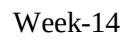


Draw the object according to the given drawing



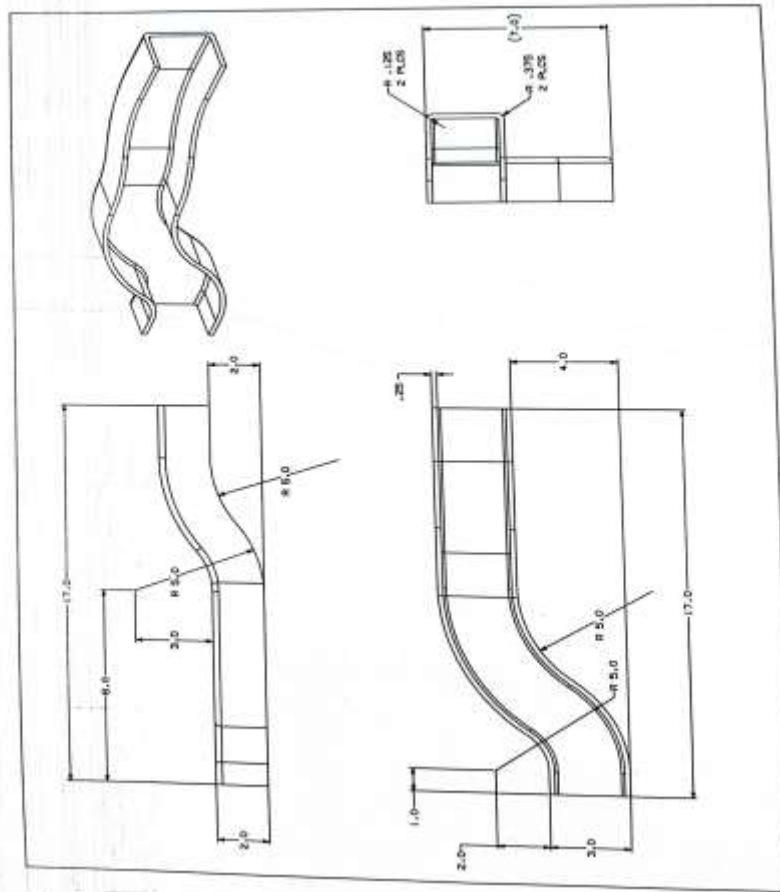
15.	Draw the object according to the given drawing		Week -13
16.	Draw the object according to the given drawing		Week -14

Draw the object according to the given drawing



18.

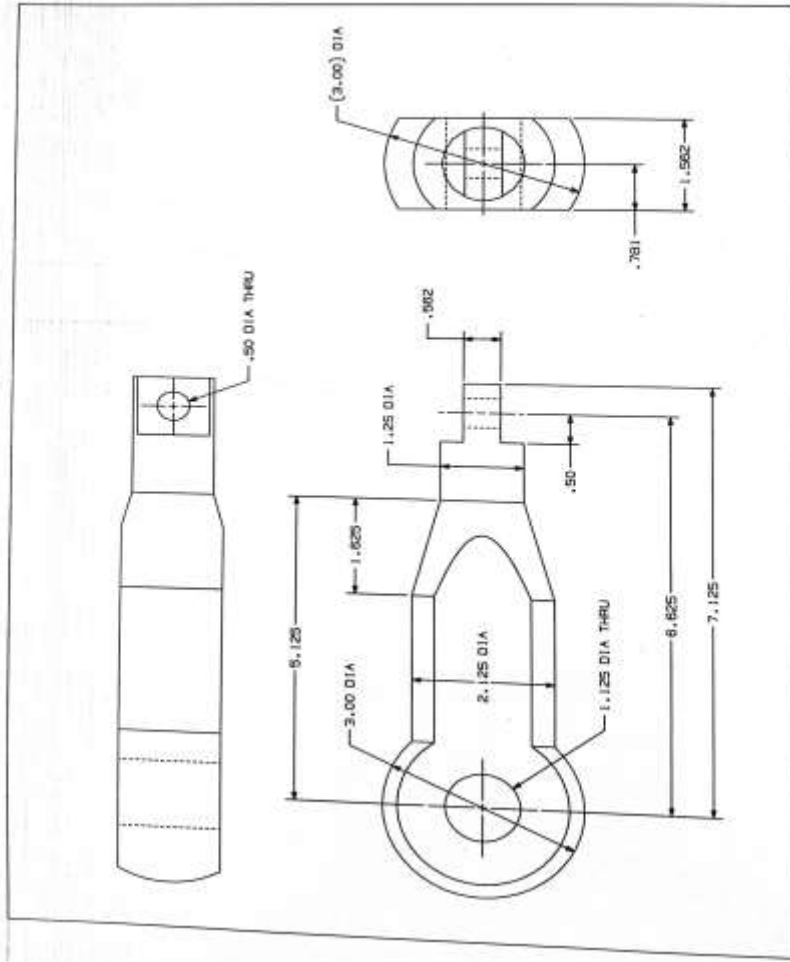
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Week-14

19.

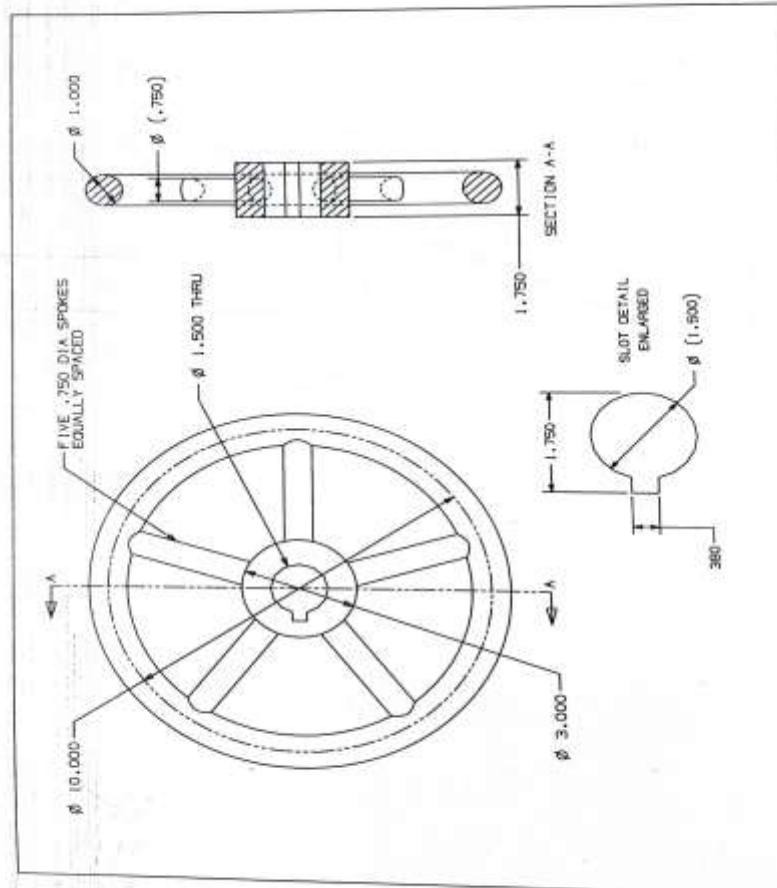
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Week-14

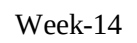
20.

Draw the object according to the given drawing



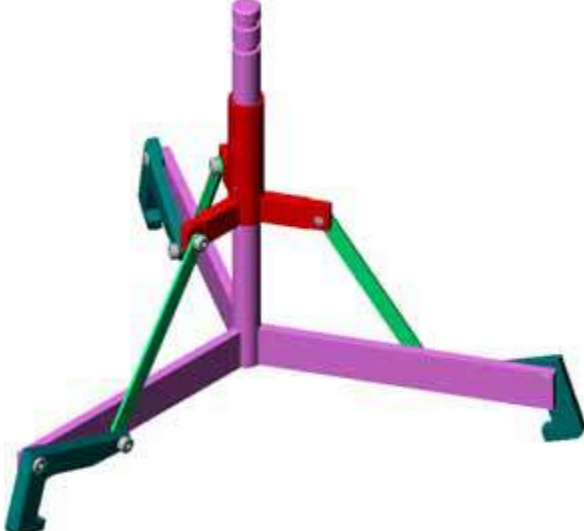
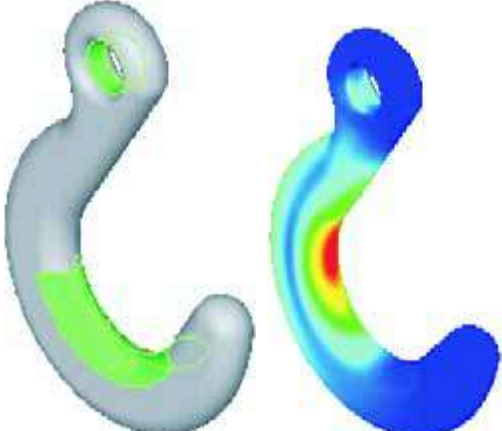
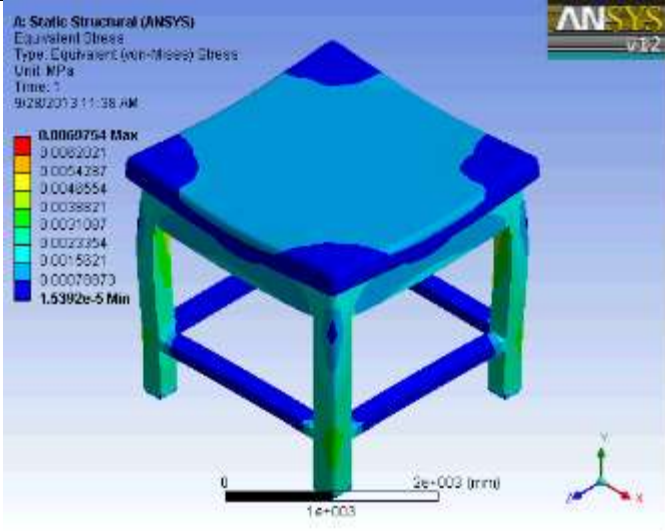
Week-14

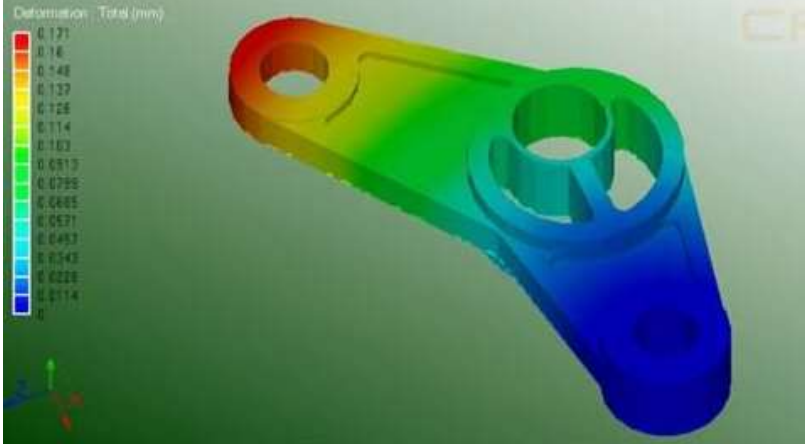
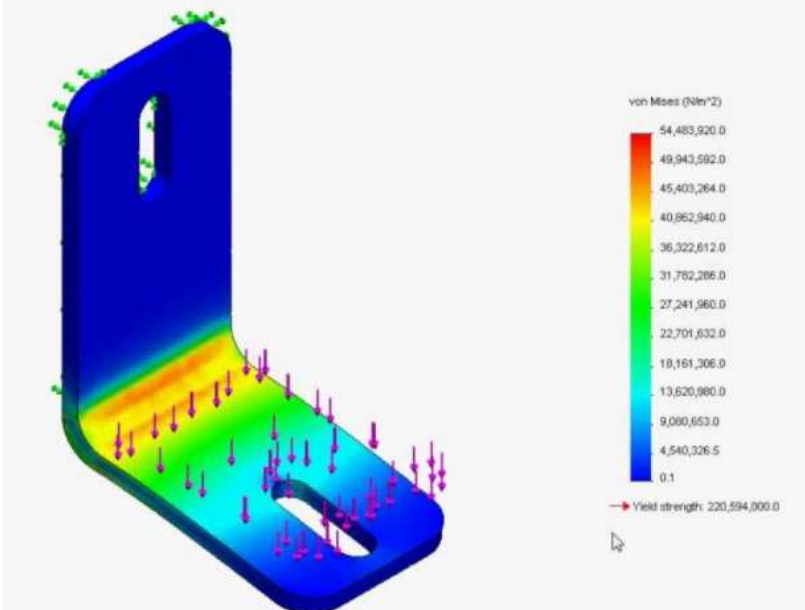
Draw the object according to the given drawing



Draw the object according to the given drawing



25.	Creating an animation of the Claw-Mechanism		Week-16
26.	Analyze a Hook		Week-17
27.	Analyze the table	 ANSYS v12.1 A: Static Structural (ANSYS) Equivalent Stress Type: Equivalent (von-Mises) Stress Unit: MPa Time: 1 9/28/2013 11:38 AM 0.0060754 Max 0.00602021 0.0054287 0.0048554 0.0038821 0.0021007 0.0023354 0.0015521 0.00070073 1.5392e-5 Min 0 1e+003 2e+003 (mm)	Week-18

28.	Stress analysis of the object	 Deformation - Total (mm) 0.121 0.116 0.114 0.112 0.110 0.108 0.106 0.104 0.102 0.100 0.098 0.096 0.094 0.092 0.090 0.088 0.086 0.084 0.082 0.080 0.078 0.076 0.074 0.072 0.070 0.068 0.066 0.064 0.062 0.060 0.058 0.056 0.054 0.052 0.050 0.048 0.046 0.044 0.042 0.040 0.038 0.036 0.034 0.032 0.030 0.028 0.026 0.024 0.022 0.020 0.018 0.016 0.014 0.012 0.010 0.008 0.006 0.004 0.002 0.000	Week-19
29.	Stress analysis of the object	 von Mises (N/mm²) 54,483,920.0 49,943,582.0 45,403,264.0 40,862,946.0 36,322,612.0 31,782,286.0 27,241,960.0 22,701,632.0 18,161,306.0 13,620,980.0 9,080,653.0 4,540,326.5 0.1 → Yield strength: 220,594,000.0	Week-20

Suggestive Format and Sequence Order of Motivational Lectures

Mentor

Mentors are provided an observation checklist form to evaluate and share their observational feedback on how students within each team engage and collaborate in a learning environment. The checklist is provided at two different points: Once towards the end of the course. The checklists are an opportunity for mentors to share their unique perspective on group dynamics based on various team activities, gameplay sessions, pitch preparation, and other sessions, giving insights on the nature of communication and teamwork taking place and how both learning outcomes and the student experience can be improved in the future.

Session- 1 (Communication):

Please find below an overview of the activities taking place Session plan that will support your delivery and an overview of this session's activity.

Session- 1 OVERVIEW
<i>Aims and Objectives:</i>
- To introduce the communication skills and how it will work - Get to know mentor and team - build rapport and develop a strong sense of a team - Provide an introduction to communication skills - Team to collaborate on an activity sheet developing their communication, teamwork, and problem-solving - Gain an understanding of participants' own communication skills rating at the start of the program

Activity:	Participant Time	Teacher Time	Mentor Time
Intro Attend and contribute to the scheduled.			
Understand good communication skills and how it works.			
Understand what good communication skills mean			
Understand what skills are important for good communication skills			
Key learning outcomes:	Resources:		Enterprise skills developed:

• Understand the communication skills and how it works. • Understand what communication skills mean • Understand what skills are important for communication skills	• Podium • Projector • Computer • Flip Chart • Marker	• Communication • Self Confidence • Teamwork
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Schedule	Mentor Should do
Welcome: 5 min	Short welcome and ask the Mentor to introduce him/herself. Provide a brief welcome to the qualification for the class. Note for Instructor: Throughout this session, please monitor the session to ensure nothing inappropriate is being happened.
Icebreaker: 10 min	Start your session by delivering an icebreaker, this will enable you and your team to start to build rapport and create a team presentation for the tasks ahead. The icebreaker below should work well at introductions and encouraging communication, but feel free to use others if you think they are more appropriate. It is important to encourage young people to get to know each other and build strong team links during the first hour; this will help to increase their motivation and communication throughout the sessions.
Introduction & Onboarding: 20mins	Provide a brief introduction of the qualification to the class and play the “Onboarding Video or Presentation”. In your introduction cover the following: 1. Explanation of the program and structure. (Kamyab jawan Program) 2. How you will use your communication skills in your professional life. 3. Key contacts and key information – e.g. role of teacher, mentor, and SEED. Policies and procedures (user agreements and “contact us” section). Everyone to go to the Group Rules tab at the top of their screen, read out the rules, and ask everyone to verbally agree. Ensure that the consequences are clear for using the platform outside of hours. (9am-8pm) 4. What is up next for the next 2 weeks ahead so young people know what to expect (see pages 5-7 for an overview of the challenge). Allow young people to ask any questions about the session topic.
Team Activity Planning: 30 minutes	MENTOR: Explain to the whole team that you will now be planning how to collaborate for the first and second

	collaborative Team Activities that will take place outside of the session. There will not be another session until the next session so this step is required because communicating and making decisions outside of a session requires a different strategy that must be agreed upon so that everyone knows what they are doing for this activity and how. • “IDENTIFY ENTREPRENEURS” TEAM ACTIVITY • “BRAINSTORMING SOCIAL PROBLEMS” TEAM ACTIVITY” <i>As a team, collaborate on a creative brainstorm on social problems in your community. Vote on the areas you feel most passionate about as a team, then write down what change you would like to see happen.</i> Make sure the teams have the opportunity to talk about how they want to work as a team through the activities e.g. when they want to complete the activities, how to communicate, the role of the project manager, etc. Make sure you allocate each young person a specific week that they are the project manager for the weekly activities and make a note of this. Type up notes for their strategy if this is helpful - it can be included underneath the Team Contract.
Session Close: 5 minutes	MENTOR: Close the session with the opportunity for anyone to ask any remaining questions. Instructor: Facilitate the wrap-up of the session. A quick reminder of what is coming up next and when the next session will be.

Motivational Lectures Links

Topic	Speaker	Link
How to face problems in life	Qasim Ali Shah	https://www.youtube.com/watch?v=OrQte08MI90
Just control your emotions	Qasim Ali Shah	https://www.youtube.com/watch?v=JzFs_yJt-w
How to communicate effectively	Qasim Ali Shah	https://www.youtube.com/watch?v=PhHAQEGehKc
Your attitude is everything	Tony Robbins Les Brown David Goggins Jocko Willink Wayne Dyer Eckart Tolle	https://www.youtube.com/watch?v=5fS3rj6eIFg
Control your emotions	Jim Rohn Les Brown TD Jakes Tony Robbins	https://www.youtube.com/watch?v=chn86sH0O5U
Defeat fear, build confidence	Shaykh Atif Ahmed	https://www.youtube.com/watch?v=s10dzfbozd4
Wisdom of the eagle	Learn Kurooji	https://www.youtube.com/watch?v=bEU7V5rJTtw
The power of attitude	Titan Man	https://www.youtube.com/watch?v=r8LJ5X2ejqU
Stop wasting time	Arnold Schwarzenegger	https://www.youtube.com/watch?v=kzSBrJmXqdg
Risk of success	Denzel Washington	https://www.youtube.com/watch?v=tbnzAVRZ9Xc

Success Story

S. No	Key Information	Detail/Description
1.	Self & Family background	Prof. Dr. Zeeshan Ali, belongs to the a small village called Hala near Hyderabad, is an example of how hard work and perseverance can reap rich rewards. He completed his graduation from UET Peshawar then he moved to UK for higher studies in the field of mechatronics. He is not a traditional professor but a fitness trainer and also industry consultant, health and safety inspector last but not the least expert and practical based approach industrial consultant which links students directly to the industry. Dr. Zee has achieved lots of academic awards, and national and international research papers on his fields, which make him on the top of its mates. He always stays ahead of his time. He has had to work hard to differentiate himself and stay true to his goal. His renowned achievement includes development of design the robust solution for Rolls Royce jet plane, electric vehicle design, vertical axis wind turbine model for efficient energy production system, Autonomous submarine, and many more.. His expertise in Solid works, CREO/PRO E, and ANSYS, specially all mechanical and complex structures design and analysis modelling and designing of control systems to solve the real world problems. His famous saying is: If you work harder, you can change the odds of success.
2.	How he came on board NAVTTC Training/ or got trained through any other source	-

3.	Post-training activities	Dr. zee's area of expertise is in mechatronics. In his first start of research he found so much difficulty in this because the gap of education in PAKISTAN as compare to UK. Then he started working hard and achieved what he aimed for. After coming from UK he trained thousands of students for the same purpose and helped them to develop the skills in core field of mechatronics.
4.	Message to others (under training)	Take the training opportunity seriously Impose self-discipline and ensure regularity Make Hard work pays in the end so be always ready for the same.

Note: Success story is a source of motivation for the trainees and can be presented in several ways/forms in a NAVTTC skill development course as under: -

1. To call a passed out successful trainee of the institute. He will narrate his success story to the trainees in his own words and meet trainees as well.
2. To see and listen to a recorded video/clip (5 to 7 minutes) showing a successful trainee Audio-video recording that has to cover the above-mentioned points.*
3. The teacher displays the picture of a successful trainee (name, trade, institute, organization, job, earning, etc) and narrates his/her story in the teacher's own motivational words.

** The online success stories of renowned professional can also be obtained from **Annex-II***

Workplace/Institute Ethics Guide

Work ethic is a standard of conduct and values for job performance. The modern definition of what constitutes good work ethics often varies. Different businesses have different expectations. Work ethic is a belief that hard work and diligence have a moral benefit and an inherent ability, virtue, or value to strengthen character and individual abilities. It is a set of values-centered on the importance of work and manifested by determination or desire to work hard.

The following ten work ethics are defined as essential for student success:

1. Attendance:

Be at work every day possible, plan your absences don't abuse leave time. Be punctual every day.

2. Character:

Honesty is the single most important factor having a direct bearing on the final success of an individual, corporation, or product. Complete assigned tasks correctly and promptly. Look to improve your skills.

3. Team Work:

The ability to get along with others including those you don't necessarily like. The ability to carry your weight and help others who are struggling. Recognize when to speak up with an idea and when to compromise by blend ideas together.

4. Appearance:

Dress for success set your best foot forward, personal hygiene, good manner, remember that the first impression of who you are can last a lifetime

5. Attitude:

Listen to suggestions and be positive, accept responsibility. If you make a mistake, admit it. Values workplace safety rules and precautions for personal and co-worker safety. Avoids unnecessary risks. Willing to learn new processes, systems, and procedures in light of changing responsibilities.

6. Productivity:

Do the work correctly, quality and timelines are prized. Get along with fellows, cooperation

is the key to productivity. Help out whenever asked, do extra without being asked. Take pride in your work, do things the best you know-how. Eagerly focuses energy on accomplishing tasks, also referred to as demonstrating ownership. Takes pride in work.

7. Organizational Skills:

Make an effort to improve, learn ways to better yourself. Time management; utilize time and resources to get the most out of both. Take an appropriate approach to social interactions at work. Maintains focus on work responsibilities.

8. Communication:

Written communication, being able to correctly write reports and memos.
Verbal communications, being able to communicate one on one or to a group.

9. Cooperation:

Follow institute rules and regulations, learn and follow expectations. Get along with fellows, cooperation is the key to productivity. Able to welcome and adapt to changing work situations and the application of new or different skills.

10. Respect:

Work hard, work to the best of your ability. Carry out orders, do what's asked the first time. Show respect, accept, and acknowledge an individual's talents and knowledge. Respects diversity in the workplace, including showing due respect for different perspectives, opinions, and suggestions.