

'a School of Industry Oriented
Engineering & Solutions'

offers program available in offline and online modes

TECHNICAL PROFILE BUILDING FOR MS ABROAD

A Highly Practical Course in **Design Engineering**
Domain with Hands-on Experience as per
International Industry Standards

DURATION: 12 WEEKS

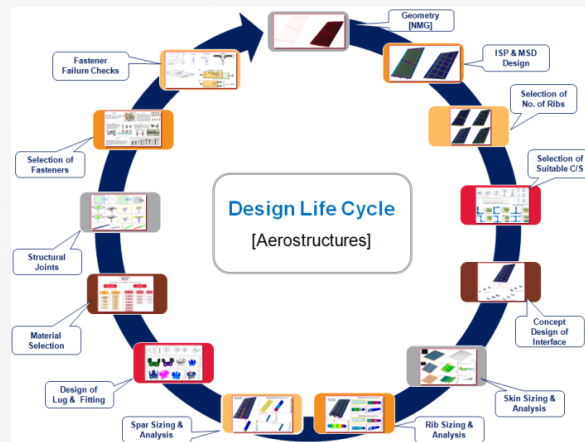
WHO CAN ATTEND?

Ongoing Students and Graduates of
Mechanical & Aerospace domain aspiring
for Masters in abroad universities

COURSE CONTENT

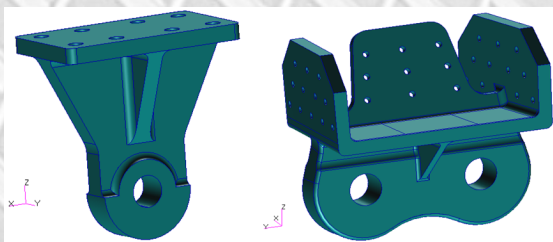
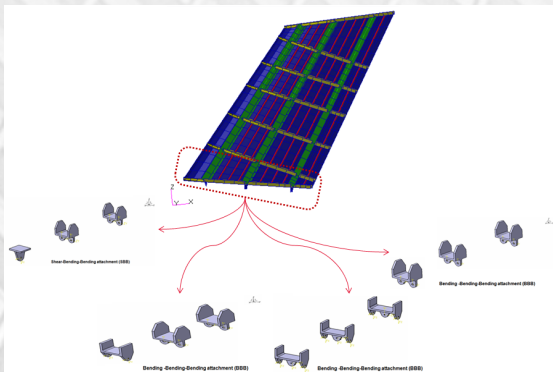
01 General Topics

- Factors Driving Engineering Industry
- Product Development Cycle & Design Life Cycle
- Role of Advanced Materials in Present & Future Engineering Applications
- Role of Engineering Knowledge in Long Term Employment
- Roles & Responsibilities of an Engineer
- Global Customer Requirements & Opportunities
- Resume Building & Interview Preparation Techniques



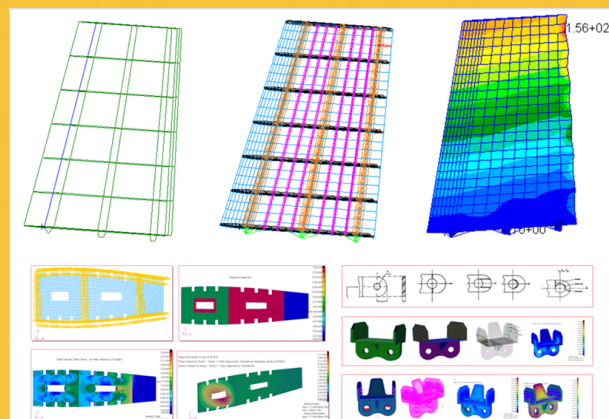
02 Engineering Design

- Design and Validation of Structural Beam & Industrial Frame Structure
- Selection of Suitable Cross-Sections Based on the Design Requirements
- Design Methodology & Considerations of Primary & Secondary Structures
- Concept study and design of Semi-monocoque Structures
- Concept Design & Detail Design, Structural Configurations, Structural Joints
- Sheet Metal & Machined Component Design Criteria
- Conceptual Design of Vertical Tail to Rear Fuselage Interface
- MBD and GD&T



03 Engineering Analysis

- Role of FEM & FEA in Aerospace & Mechanical Engineering Domain
- Structural Idealisation Techniques
- Validation of FEM as per Global Industry Standards
- Deep insight about 1D, 2D & 3D analysis with meaningful examples
- Hands-on Experience on Linear Static & Buckling Analysis
- Analysis of Structures using Metallic & Composite Materials
- Local Analysis with Cut-outs & Reinforcements
- Sizing and analysis techniques as per global industry requirements



04 Stress Calculations

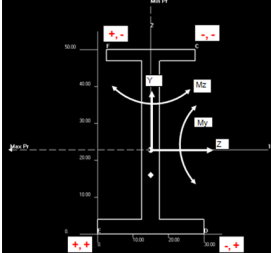
- Computation of Section Properties in Structured Approach
- Significance of Shear Force & Bending Moment and Free-Body Diagrams
- Computation of Equilibrium Forces & Moments
- Computation of Different Types of Stresses
- Sizing and Verification of Secondary Brackets
- Design and Analysis of Industrial Frame Structure
- Sizing of Lug using ESDU procedure & Design of Interface Fitting from Concept to Detail Design Phase
- Bolt Group Analysis, Free-Body-Diagram & Estimation of Bolt Forces
- Fastener Failure Checks
- Sizing of Stringers, Flat & Curved Panels using Roark & ESDU Methods
- Approved Global Engineering Methods like Michael NIU, Bruhn, ESDU, Roark, MMPDS etc.

$$\sigma_{@C} = \left\{ \left(\frac{M_y}{I_y} * z \right) * -1 \right\} + \left\{ \left(\frac{M_z}{I_z} * y \right) * -1 \right\}$$

$$\sigma_{@C} = \left\{ \left(\frac{300000}{13354.17} * 12.5 \right) * -1 \right\} + \left\{ \left(\frac{-1240000}{136364.7} * 27.17 \right) * -1 \right\}$$

$$\sigma_{@C} = [-280.81] + [247.06]$$

$$\sigma_{@C} = -33.7 \text{ N/mm}^2$$



$$\sigma_{@D} = \left\{ \left(\frac{M_y}{I_y} * z \right) * -1 \right\} + \left\{ \left(\frac{M_z}{I_z} * y \right) * 1 \right\}$$

$$\sigma_{@D} = \left\{ \left(\frac{300000}{13354.17} * 15 \right) * -1 \right\} + \left\{ \left(\frac{-1240000}{136364.7} * 22.83 \right) * 1 \right\}$$

$$\sigma_{@D} = [-336.97] + [-207.60]$$

$$\sigma_{@D} = -544.6 \text{ N/mm}^2$$

$$\sigma_{@F} = \left\{ \left(\frac{M_y}{I_y} * z \right) * 1 \right\} + \left\{ \left(\frac{M_z}{I_z} * y \right) * -1 \right\}$$

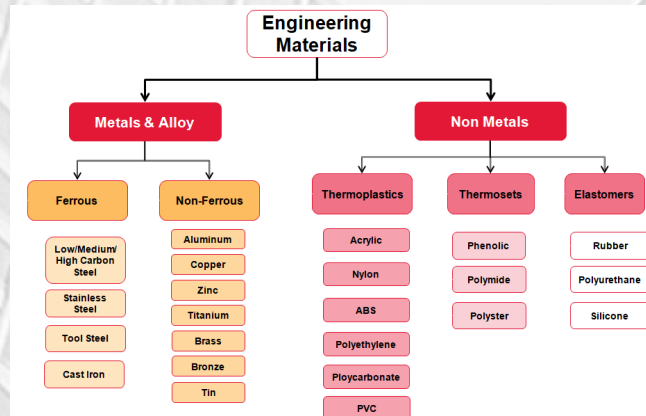
$$\sigma_{@F} = \left\{ \left(\frac{300000}{13354.17} * 15 \right) * 1 \right\} + \left\{ \left(\frac{-1240000}{136364.7} * 27.17 \right) * -1 \right\}$$

$$\sigma_{@F} = [280.81] + [247.06]$$

$$\sigma_{@F} = 527.9 \text{ N/mm}^2$$

05 Engineering Materials

- Introduction to Ferrous & Non-Ferrous Alloys
- Detail Study of Non-Ferrous Alloys
- Next Gen. Aluminum Alloys & Their Benefits
- Material Selection Criteria as per FAR Guidelines
- Form of Materials & Material Failure Theories



06 Composite Materials & Composite Design

- Introduction to Composite Materials
- Mechanical Properties of Composites & its Benefits
- Stacking Sequence Formation Guidelines as per Global Industry Standards
- Verifying Compliance with Guidelines
- Sizing of Composite Flat Panels
- Simulation of Composite Structures
- Composite Ply Drop Techniques
- Technical Challenges & Concerns of Composite Materials
- Design Considerations of Composite Structures
- Composite Failure Modes & Failure Theories
- Introduction to Manufacturing Methods of Composite Structures

FREQUENTLY ASKED QUESTIONS

Q: I am really interested to build career in Design domain. However, my CGPA/Aggregate is not good (<8.0). Is my academic performance going to affect my career chances?

A: The recent trends suggest that Engineering domain in our nation has been witnessing a significant shift in hiring approach, where who you are (relevant knowledge & appropriate skills) matters more than what your marks are. Even with lower CGPA, if you have strong profile/resume, you have much better chances of hiring by the companies for the core engineering jobs.

Q: What does strong profile/resume mean?

A: A strong profile is one where the candidate is able to display the knowledge gained during his academic pursuit and which is solidified by good internships and good projects in the area of his/her field of interest.

Q: What do you mean by long term career/employment?

A: Long-term career/employment means, the Engineer is able to sustain his/her job in their organization/domain, or able to shift domains with ease during tough times in their career/ job market for long-term at least up to 50+ years. It's been witnessed that, professionals who are just having experience on software tools are finding difficult to sustain long-term employment and are in the threat of losing their jobs at the age of 30-35.

Q: I wish to pursue Masters abroad in Aerospace/Mechanical domain. How is the course beneficial for me?

A: The long-term program 'Core Design Engineering' contains a vast range of topics and subjects which are essential for someone who wishes to become a real-time design engineer. With this Point-of-View, the course shall aid the participants in building a strong profile which displays the right knowledge and skill-sets of the candidates, along with relevant industry standard projects. A strong profile always helps in landing admission at a reputed university and opt for the right internships during Master studies.

Q: The course content/examples seem to be oriented more towards Aerospace Industry. Any specific reason?

A: Aerospace Industry is one of the very few Industries where the best Engineering methodologies and practices exist. When a participant has exposure with the best engineering, he/she shall be confident to apply for jobs in related domains in Design Engineering like Automobile, Rail, and Heavy Engineering etc.

Q: I am an Engineering recent graduate. Will I be able to follow and understand the content of the program during the course period?

A: The course structure has been framed by our team of Industry Experts from different verticals of Design background, who have put forward the best learnings during their professional career into this mentorship program. The program follows a unique methodology of transforming a Fresher to a Beginner. This methodology ensures the program participants are able to grasp the technical content and become confident to defend their learnings during brainstorming sessions of the program.

PROGRAM TAKEAWAYS

- Primary focus on Engineering Concepts considering the Physics of the problems and Real-time simulation techniques.
- Program focuses not just on employment based skills; also provides relevant core engineering knowledge which ensures participants stand unique with increased confidence, and thus enable to sustain long-term employment.
- Makes them to seek employment in Engineering Serious Companies such as Captive Centers, MNCs, MROs, R & D centers, Design Organizations and Start-Ups.
- Mentoring as per Global Industry Requirements & Standards.
- Highest emphasis on understanding concepts rather than just learning few theories.
- Interactive sessions encourages for proactive discussions from participants which enhances their self confidence to face interviews.
- Get clear understanding on how to approach for Higher Studies in technical domain.
- Gain insights on job requirements in OEMs and Core Engineering Industry.
- *Program is highly recommended for the students, graduates and working professionals who wish to pursue Masters in Abroad Universities OR who has an ambition to work in Core Engineering Domain and has passion to contribute to Engineering Community.*



Have questions???

Reach us today....

CONTACT US @



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WANT TO KNOW MORE ABOUT US???



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