

## **An Analysis of Careers in building industry in Asia and the Curriculum of Bachelor's Degree in Civil Engineering**

**<sup>1</sup>BV Mathew and <sup>2</sup>Dr. V Thanikachalam**

<sup>1</sup>Research Scholar, National Institute of Technical Teachers Training and Research (NITTTR), Taramani, Chennai

<sup>2</sup>Professor & Head, Correspondence Course Department, NITTTR, Taramani, Chennai

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### **Abstract**

India has emerged as a human capital supplier to Asia. A large number of the civil engineering students are employed in the Middle Eastern countries. This study is an attempt to analyze the various career options for civil engineers in the fast growing building industry in Asia, the competencies required for them and the curriculum of Bachelor's degree in civil engineering that prepares them for the profession. It reveals the gaps in competencies of the graduates to meet the needs of the building industry. Overall the curriculum was found to be very much lacking in focus as far as the computer oriented methods required for various building industry occupations, application of modern construction machinery, project management, financial management, planning of industrial and residential complexes, analysis of buildings due to earth quake forces and advances in construction technology. Hence, it is suggested to redesign the Civil Engineering programme as an updated programme in "Building Technology" and include courses which will provide appropriate key competencies for the graduates to serve the building industry not only in India but also in other Asian countries.

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## **Influence of Longitudinal Reinforcement on the Behavior of SFRC Members under Pure Torsion**

**Dr. TD Gunneswara Rao**

Associate Professor, Department of Civil Engineering, National Institute of Technology, Warangal; tdgtdg@gmail.com

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### **Abstract**

Steel fiber reinforced concrete (SFRC) is a versatile construction material possessing comparable tensile strength and the best energy absorbing characteristics over conventional concrete. Significant research on this material has been carried out by several researchers on the behavioral aspects of SFRC subjected to different loading conditions. Many researchers have reported the beneficial aspects of SFRC and reinforced SFRC under different loading conditions viz., flexure, axial compression, shear and their combinations. Limited studies on the torsional strength and behaviour of reinforced SFRC members were reported. Perhaps it may be due to the reason that the pure torsion rarely occurs in structures, yet the studies on the torsional performance of the SFRC members cannot be discarded. The present paper deals with the effect of steel fibers on the behaviour of SFRC members containing different proportions of longitudinal reinforcement. Pure torsion tests on the 15 reinforced SFRC beams revealed that, certain minimum amount of longitudinal reinforcement is necessary to improve the torsional strength of the reinforced SFRC members. Fiber inclusion has increased the torsional toughness of the member.

Key words: Torsional strength – Steel fibers – Toughness – Cracking torque – over reinforced members.

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## Simulation and Optimization of Positioning of different Billets in Forging Operation of an Automobile Component

<sup>1</sup>Er. Piyush Gulati and <sup>2</sup>Er. Rajesh Kanda

<sup>1</sup>Assistant Professor, Mechanical Engineering, Lovely Professional University, Jalandhar, Punjab, India

<sup>2</sup>Assistant Professor, Mechanical Engineering, PEC University of Technology, Chandigarh; [piyushgulati@gmail.com](mailto:piyushgulati@gmail.com)

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### Abstract

Forging is an important industrial process used to make a variety of high-strength components for automotive, aerospace and other applications. The billets (raw material) used for forging process are of different shapes like cylindrical, cubical and cuboid. This paper presents the analysis of positioning of the above defined shapes to be kept on the bottom die during forging process, using DEFORM 3D software. The aim is to get a particular range for positioning the billets of different shapes which will result in defect free forging component. After a number of simulations, a range for positioning of the billets have been proposed and it is found that if the billets are kept beyond that limit, it showed the defects of underfilling. The research is conducted on a ST 52/3 steel End plate used in automobiles. This research would be beneficial in reducing the defective forging components.

**Keywords:** Billets, DEFORM 3D, ST 52/3 Steel, Dies, End Plate.

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## Modal Testing of a Cantilever Beam Structure

<sup>1</sup>Er. Shankar Sehgal and <sup>2</sup>Dr. Harmesh Kumar

<sup>1</sup>Assistant Professor, University Institute of Engg. & Technology, Panjab University, Chandigarh; [shankarsehgal@yahoo.com](mailto:shankarsehgal@yahoo.com)

<sup>2</sup>Associate Professor, University Institute of Engg. & Technology, Panjab University, Chandigarh; [shaarut@yahoo.com](mailto:shaarut@yahoo.com)

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### Abstract

In this paper experimental work related to modal testing of a cantilever beam structure has been presented. Impulse hammer based modal testing procedure has been adopted in the present research work. Experimentally obtained frequency response functions are processed to extract modal parameters such as natural frequencies and damping ratios of the beam structure. The experimentally observed natural frequencies are then compared with their finite element counterparts to evaluate the errors in prediction. Reasons of such errors are also identified and the need of finite element model updating is highlighted. Also, it was demonstrated that properly planned testing can be performed successfully even with some limited facilities, such as only one accelerometer, an impulse hammer, FFT analyzer and a computer terminal.

**Keywords:** Modal testing, finite element analysis.

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## Prediction of Hole Radius and Material Removal Rate due to Single Pulse Laser Beam Drilling using Finite Element Method

<sup>1</sup>Sanjay Mishra, <sup>2</sup>Dr. Vinod Yadava

<sup>1</sup>Research Scholar, Mechanical Engineering Department, Motilal Nehru National Institute of Technology, Allahabad

<sup>2</sup>Professor, Mechanical Engg. Department Motilal Nehru National Institute of Technology, Allahabad; [vinody@mnnit.ac.in](mailto:vinody@mnnit.ac.in)

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### Abstract

2-D axisymmetric Finite Element Method (FEM) based thermal model has been developed for the determination of the transient temperature distribution in difficult to drill thin aluminium sheet due to single pulse Laser Beam Drilling (LBD). Simulation results showing the effect of input parameters such as pulse width, pulse frequency and average power of laser on hole radius at top and bottom surface of target material as well as on material removal rate has been presented using the developed mathematical model. It was observed that pulse frequency has more prominent role in defining the shape of hole whereas material removal rate is more affected by pulse width when LBD was performed at fixed average power of laser.

**Keywords:** axisymmetric thermal model, finite element method, phase change, single pulse laser beam drilling.

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## Experimental Evaluation of Surface Roughness for Turning of UD-GFRP Composites Material using Regression Modeling

<sup>1</sup>Surinder Kumar, <sup>2</sup>Dr. Meenu, <sup>3</sup>Dr. PS Satsangi, <sup>4</sup>Sushil Kumar and <sup>5</sup>Dr. HK Sardana

<sup>1</sup>Research Scholar, Mechanical Engineering, National Institute of Technology, Kurukshetra

<sup>2</sup>Associate Professor, Mechanical Engineering, National Institute of Technology, Kurukshetra

<sup>3</sup>Associate Professor, Mechanical Engineering, PEC University of Technology, Chandigarh

<sup>4</sup>Associate Professor, Mechanical Engineering, Indo-Global College of Engineering, Mohali

<sup>5</sup>Scientist G & Head, Computational Instrumentation, Central Scientific Instruments Organization, Chandigarh

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### Abstract

This paper presents a study on the effects of process parameters on the surface roughness in turning process. Regression modeling is employed to model surface roughness in terms of machining parameters such as cutting speed, depth of cut, cutting environment (dry & wet) and feed rate. The experiments are conducted on UD-GFRP by polycrystalline diamond tool using NH22, HMT Lathe machine and surface roughness is measured using Tokyo Seimitsu Surfcom 130A. The interaction effect of the machining parameter with surface roughness is also analysed. Regression modeling is applied to predict surface roughness. Percentage error of predicted regression modeling is found to be less than 13.78%.

**Keywords:** ANOVA, Polycrystalline Diamond Tool, Regression Modeling, Surface Roughness, Turning, Unidirectional Glass Fiber Reinforced Plastics (UD-GFRP).

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## A study of Education and Research Opportunities for Electronics Engineering Professionals

<sup>1</sup>Vijay Nehra and <sup>2</sup>Sandeep Dahiya

<sup>1&2</sup>Department of Electronics & Communication Engg., School of Engg. & Sciences, Bhagat Phool Singh Mahila Vishwavidyalaya, Khanpur-Kalan, Sonapat, India; [nehra\\_vijay@yahoo.com](mailto:nehra_vijay@yahoo.com) and [sandy\\_dahiya2001@yahoo.com](mailto:sandy_dahiya2001@yahoo.com)

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### Abstract

Since the last decade of the twentieth century, there has been a phenomenal growth in the number of institutions offering engineering education. It has witnessed an assorted increase in intake capacity of Electronics Engineering (EE) and related disciplines. The phenomenal growth during the past couple of decades and further momentum during 11<sup>th</sup> year plan demands EE professional with research degree to support educational and research sector for the technological development of the nation. Specialized qualified skilled professional is one of the essential inputs for a successful academic reform. The present paper provides a study of career opportunities in educational and research sector from Indian perspective. It is also useful for the EE professionals to plan and progress the career.

**Keywords:** Electronics Engineering, Education, Research, Undergraduates, Postgraduates, Doctoral.

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