



NEWSLETTER

METALLURGY DEPARTMENT

July 2018 to December 2018



METALLURGY

ABOUT THE INSTITUTE

Established in 2004, Government Engineering College, Gandhinagar (GEC-Gn) takes pride in its highly motivated students. Our students are life-long assets that help this institute to continuously evolve and work towards its Vision. Approved by AICTE. The College is administrated by Directorate of Technical Education, Gujarat State, Gandhinagar. GEC-Gn is affiliated to Gujarat Technological University. GEC-Gn offers its students a wide range of courses like Biomedical, Computer, Electronics & Communication, Instrumentation & Control, Information Technology and Metallurgy.

VISION OF THE INSTITUTE

To be a premier engineering institution, imparting quality education for innovative solutions relevant to society and environment.

MISION OF THE INSTITUTE

- To develop human potential to its fullest extent so that intellectual and innovative engineers can emerge in a wide range of professions.
- To advance knowledge and educate students in engineering and other areas of scholarship that will best serve the nation and the world in future.
- To produce quality engineers, entrepreneurs and leaders to meet the present and future needs of society as well as environment.

METALLURGY

ABOUT THE DEPARTMENT

The Metallurgy Department since its inception in 2008 is a backbone of GEC-Gandhinagar's events, research activities and initiatives. It is a unique initiative of Government of Gujarat in the present science and technology education and research scenario of India. At present, the department offers a four year undergraduate course in engineering. Faculty members are good blend of industrial/ academic research experienced, studied from national and state reputed institutes. Department has developed COQ (Centre for Quality) NDT which established under "Vibrant Gujarat-2019"- Financial MOU in collaboration with Gulfnde along with various well equipped metallurgical laboratories.

Currently, the focus of department activities are multi-directional with an emphasis on both research and education. Our collaborations with FCIPT, CFER, INDUS University, PUPU, IIM-Baroda Chapter, IIF- Ahmedabad Chapter, ASM International - Gujarat Chapter, IE-Gujarat Section, etc. Students are encouraged and supported to actively participate in various curricular and non-curricular activities at different level.

VISION OF THE DEPARTMENT

Developing excellence in Metallurgy Engineering education through research, development innovation and team work for the benefit of society and environment.

MISION OF THE DEPARTMENT

- To prepare competent metallurgy engineers who can apply metallurgical fundamentals to control and manage different metallurgical and materials processing operations to produce quality metals products in industries.
- To deliver information about current trends in the field of metallurgy and materials to the students.
- To encourage students to work on innovative projects related to metallurgy engineering for managing defects free, economical, energy efficient products, processes or devices to best serve the nation to fulfil the socio-economic, techno-commercial and environmental needs.

ACTIVITIES/TRAINING TAKEN BY FACULTY MEMBERS

Sr. No.	Name of the Faculty	Title of Activities / Training	Duration	Venue
1	Dr. I. B. Dave	STTP on “NBA Accreditation through outcome based Education”	23/7/18 - 27/7/18	NITTTR - Chandigarh
3	Prof. S. I. Patel	Induction Programme (Phase-II)	22/10/2018 to 02/11/2018	NITTTR- Bhopal
3	Prof. D. G. Sharma	STTP on “Advances in Nano-Technology”	09/07/18– 13/07/18	NITTTR - Ahmedabad Ext. Centre
4	Prof. S. I. Patel	“Electroforming and Corrosion”	24/09/18– 28/09/18	NIT-Rourkela

ACHIVEMENTS OF THE FACULTIES

Prof. P. K. Nanavati presented Research Paper in IIW 71st, Annual Assembly and Int. Conference in Bali Convention Center, Bali Indonesia.



Prof. P.K.Nanavati presented his research findings on Ferrite content & Ch-SCC in Duplex SS Welds presented in IIW organized National Welding Meet 2018 during 3-4 August 2018

Prof. P.K.Nanavati presented his research findings on Ch-SCC on Duplex SS Welds during 3rd-4th Oct 2018 in Two days Symposium on “Corrosion & Its Control SCIC 2018” organized by the M.S.University of Baroda.

GLIMPSES OF INTERNATIONAL EXPOSURE OF FACULTY

Prof. P.K.Nanavati presented Research Paper in IIW 71st, Annual Assembly and Int. Conference in Bali Convention Center, Bali Indonesia.



TABLET DISTRIBUTION TO 1ST YEAR STUDENTS



In accompaniment of Prof. D. G. Sharma and Prof. D. V. Mahant, Tablet distribution activity was organised at GU Convention Hall, Ahmedabad for 1st Year Students on 3/11/2018.

EXPERT LECTURES

Sr. No	Semester	Subject	Venue	Present Students
1	7th sem	Expert Talk on Sand Testing by Mr. Prakash Vaishnav	Divine Lab & CFER, Odhav, Ahmedabad	30
2	7th Sem	Plasma Technology by Dr. Mukesh Ranjan	FCIPT-IPR, Sec-25, Gandhinagar	40

Expert lecture on various topics like Plasma Technology and Sand Testing has been organized by Metallurgy department for the benefit of students. Reputed industry personals has delivered the expert lectures followed by visit of various departments at CFER Ahmedabad and PCIPT, Gandhinagar.

GLIMPSES OF VARIOUS “**EXPERT LECTURES**”



GLIMPSES OF “**INDUSTRIAL/LAB VISITS**”



GLIMPSES OF “**1ST YEAR ORIENTATION PROGRAMME**”



INDUSTRIAL VISITS

- 5th Semester 30 students have visited **Divine Lab & CFER, Odhav, Ahmedabad** along with Prof. M. S. Dani on 7/7/2018.
- 7th semester 40 students visited **FCIPT-IPR, Sec-25, Gandhinagar** along with Prof. B. R. Rana & Prof. D. G. Sharma) on 16/7/2018.
- 5th semester 43 students have visited **Shah Alloys Ltd, Santej Plant, Ahmedabad** accompanied by prof. S. I. Patel & Prof. P. K. Nanavati on 10/8/2018.



CFER, Odhav

Industrial Visit at Divine Lab & CFER, Odhav, Ahmedabad & Expert Talk on Sand Testing by Mr. Prakash Vaishnav (30 Students along with Prof. M. S. Dani)

Industrial Visit at FCIPT-IPR, Sec-25, Gandhinagar & Expert talk on Plasma Technology by Dr. Mukesh Ranjan (40 Students along with Prof. B. R. Rana & Prof. D. G. Sharma)



Visit of BE SEM 5th Metallurgy 43 students to Shah Alloys Ltd, Santej Plant, Ahmedabad. Accompanied by Prof. S. I. Patel and Prof. P. K. Nanavati



Shah Alloys Ltd.

INDUSTRIAL VISITS

- By, Prof D. G. Sharma, Asst. Prof. Metallurgy Department

Application of Titanium in aerospace industry

Titanium the fourth most abundant element in earth's crust has now become the widely used metal in the aerospace industry. The things that make it the strongest contender among other metal and alloys viz. Aluminum, Magnesium are:-

- Weight saving – it has a very high strength to weight ratio (about 16 times to that of aluminum)
- High fatigue strength as compared to aluminum which makes it best suited for highly loaded bulkheads and frames in fighter planes.
- High working temp range 200 - 500°C
- Excellent corrosion resistance
- Space saving – a landing gear made of Ti occupies less space than that of aluminum./ high density

Due to the above mentioned wonderful combinations of mechanical properties, it accounts for 42% of the total structural weight of new F-22 fighter plane and for Boeing 777 it is about 8.3%.



Typical characteristics of Ti:-

It has a great affinity for interstitial gases such as oxygen and nitrogen at elevated temperatures. Hence controlling these factors lead to increase in cost of production. It has a high reactivity with refractory lines vacuum induction furnaces; hence it is made by consumable vacuum arc melting. It is very difficult to machine because of its high reactivity, low thermal conductivity, relative low modulus, and high strength at elevated temp. In machining use slow speed, maintain high feed rates, use flood cooling, maintain sharp tools, and use rigid setups.

TECHNO RIDE

Various properties and application of Ti- alloys

Alpha alloys- they have good strength, toughness, creep resistance and is weldable also. Example =Ti-5Al-2.5Sn It is used in cryogenic applications because it retains ductility and fracture toughness down to cryogenic temp. Near alpha alloys-example Ti-6Al-2Sn-4Zr-2Mo-0.25Si It is mostly used for high temp applications (540 °C)

Alpha- beta alloys- have the best balance of mechanical properties and are the most widely used. The α - β alloy Ti-6Al-4V is by far and away the most utilized alloy (60%) in the aerospace industry. The alloy can be heat treated to moderate to high strengths levels. However its weldability is poor .about 80-90% of this alloy is used for making air frames

Beta alloys-it has better formability than near α and α - β alloy. Its biggest drawback is that it has higher density and reduced ductility on heat treatment to peak strength levels and some have limited weldability. Example: Ti-10V-2Fe-3Al –used for air frames and Ti-15V-3Al-3Cr – used for making springs because they have high tensile strength i.e. up to 200 ksi.



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GOLD



Metallurgy Department

