

A
Report of

One Week refresher on
“Refresher Course in Chemical Engineering and Technology”

Duration: 18th June 2019 to 22nd June 2019

Venue: Chemical Engineering Department, PadmabhooshanVasatraodada Patil Institute of Technology Budhgaon Sangli-MH

Organizing Institute and Department: *Jointly organized by*

1. Chemical Engineering Department, Dr. Babasaheb Ambedkar Technological University, Lonere, Raigand-MH.
2. Chemical Engineering Department, PadmabhooshanVasatraodada Patil Institute of Technology Budhgaon, Sangli-MH

Funding Agency: TEQIP-III, Under twinning program.

Coordinator:

1. Dr. Y.S.Mahajan, Professor, Department of Chemical Engineering, Dr. Babasaheb Ambedkar Technological University, Lonere, Raigand-MH
2. Prof. U.S.Patil, Associate Professor, Chemical Engineering Department, PadmabhooshanVasatraodada Patil Institute of Technology Budhgaon,Sangli-MH

Co- Coordinator:

1. Mr. P.B. Dhanke, Assistant Professor, Chemical Engineering Department, PadmabhooshanVasatraodadaPATil Institute of Technology, Budhgaon,Sangli-MH

Budget Sanctioned:

Honorarium	Rs. 60,000/-
Travel	Rs. 50,000/-
Food and Snacks	Rs. 40,000/-
Accommodation	Rs. 5,000/-
Course Material	Rs. 10,000/-
Miscellaneous	Rs. 5,000/-
TOTAL	Rs. 1,70,000/-

Sessions Conducted

Day 1: Tuesday (18/06/19)

Inauguration Function

The inauguration ceremony of one week workshop “Refresher Course in Chemical Engineering and Technology” was held on the first day of workshop in the morning. The eminent guest Dr. S.S.Bhagwat, Professor-Chemical Engineering, Dean, Internal Quality Assurance, Head, DBT-ICT Centre for Energy Biosciences Coordinator, ICT Mumbai was a chair person along with Honorable secretary Mr. AdinathMagdum, Secretary VPSSM Sangli. Dr. D.V.Ghewade, Principal PVPIT Sangli, Dr. Y.S.Mahajan, Head, Coordinator of workshop of Chemical Engineering department Dr. DBATU Lonere. Prof. U.S.Patil, Coordinator of workshop of Chemical Engineering department, PVPIT Sangli was present along with above mentioned guests. In this ceremony, Prof. U.S.Patil did welcomes to all the guest and participant of this workshop and Dr. Y.S.Mahajan has given brief introduction about the workshop on “Refresher Course in Chemical Engineering and Technology”. Felicitation of all the dignitaries on the dies was done by giving the Plants.



Session-I (Key note speaker)

Speaker: Dr. S.S. Bhagwat, Professor-Chemical Engineering, Dean, Internal Quality Assurance, Head, DBT-ICT Centre for Energy Biosciences Coordinator, ICT Mumbai.

Topic: Key Note address

In the key note address, Prof. S.S. Bhagwat started his lecture with History of Human Life. The history of human evolution is replete with examples of Mankind's victory over many things which posed difficulties. Next was Victory: Fire, Food, Metals and Wheel in that FIRE is one of the biggest worries for mankind and also aboon once controlled. Food is Organized farming changed the way human beings lived altogether. Iron and metal making allowed gadgets for which early man had to rely on stones alone. The wheel made several jobs easy for the man. That includes machines of all kind, transportation, etc.

Education seems to revolve around testing or examinations rather than learning Since outcome (marks) are used for judging, studying gets focused on 'what will be asked in exams' Since exams are a limited way of testing, learning adapts to what gets asked Instead of becoming more learned, studying focuses on achieving We end up producing unemployable engineering graduates than real engineers and so on Even a purpose of education towards employability is lower than the real, but better than the 'marks' as purpose Ask a student 'why he/she is studying' anything and thereply will invariably be about exams.

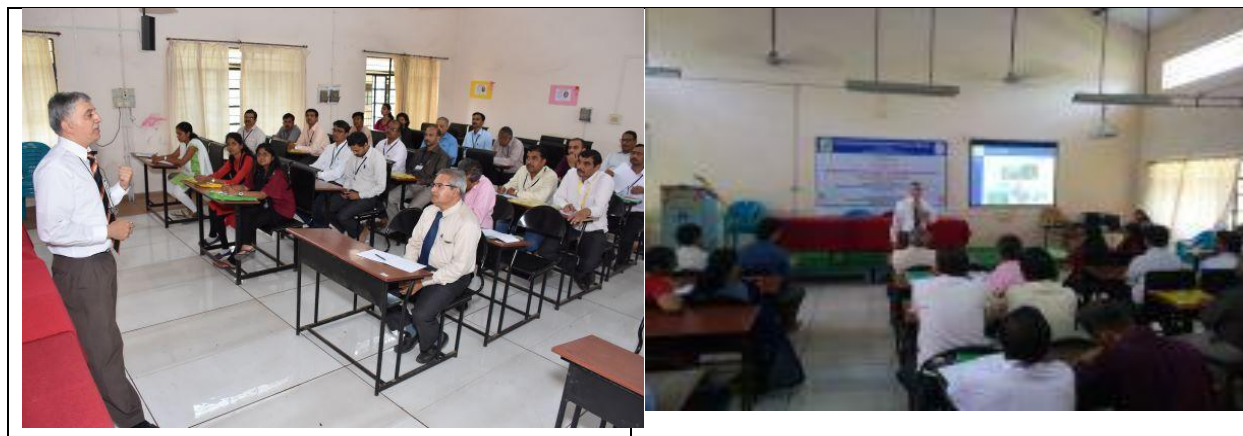


Session-II

Speaker: Dr. S.S. Bhagwat. Professor-Chemical Engineering, Dean, Internal Quality Assurance, Head, DBT-ICT Centre for Energy Biosciences Coordinator, ICT Mumbai.

Topic: Science, Society, Industry and You.

In this session, Prof. S.S. Bhagwat focuses on Needs of Human life : Food-Clothing-Shelter. Food: Organized farming – tools ,Increasing yield: synthetic fertilizers Better, varieties of crops. Cotton and wool are the primary natural resources for clothing. Synthetics: Nylon, polyester Dyes and colors Modern textiles. For the shelter we have come a long way from cave dwelling to modern buildings. Cement - concrete replaced stone and wood. Improvement in quality of life - Comforts and Luxuries – The main driving force behind most scientific developments. War - Security – Weapons Space Travel Research in these two areas has caused many of the inventions we use today. There was a time when India was dependent on import of food to feed its population. Food security is linked to fertilizers. The use of cement makes modern dwellings possible. Drugs, antibiotics, vaccines - Fight diseases! Life expectancy: average 30 to average 70 Paracetamol - a simple(!) fever reducing drug.



Day 2: Wednesday (19/06/19)

Session-I

Speaker: Dr. Y.S.Mahajan, Professor & Head, Chemical Engg. Dept. DBATU Lonere.

Topic: Reactive Distillation: Facts and Practice.

This lecture was focused on Reactive distillation. Reaction and Distillation in a single vessel Distillation is an integral part to almost each industry so RD is not much expensive though truly distillation itself is costly. Reactive Distillation employed due to which conversion increases. Transforming batch process into a continuous one, reduction of the number of distillation columns in the downstream processing. RD can be effectively provided: Reaction and Distillation Conditions allow so Care is taken to utilize system properties Economy is favorable.



Session-II

Speaker: Dr. S.V.Taralkar, Asso. Professor, Chem. Dept. MIT Alandi.

Topic: Recent Trends in Extraction of Active Ingredients from Medicinal Plants.

This session was focused on Extraction of Active Ingredients from Medicinal Plants. Dr. S.V.Taralkar explained about Extraction techniques, Soxhlet Extraction, Batch Extraction, Microwave Assisted Extraction, Ultrasound Assisted Extraction, Supercritical Fluid Extraction. An active ingredient (AI) is the ingredient in a pharmaceutical drug or pesticide that is biologically active. The similar terms active pharmaceutical ingredient (API) and bulk active are also used in medicine, and the term active substance may be used for natural products. Batch Extraction is extensively used in industry due to ease of operation and handles large capacity. MAE and UAE are advantageous as compared to traditional techniques but may not be suitable for large scale. Supercritical fluid extraction is good solution for extraction of active ingredients in moderate scale and doesn't require any purification step. Extraction followed by isolation is crucial task in herbal extraction.



Session-III

Speaker: Dr. Utkarsh Maheshwari, Associate Professor, Chem. Dept. DYP IEMR Pune.

Topic: Adsorption as an Opportunity for Wastewater treatment & Its Optimization.

In this session, Dr. Utkarsh Maheshwari reported low-cost materials have low adsorption capacity for metals removal. Few studies reported simultaneous removal of two metal ions. Few studies carried out the regeneration studies. Studies for removal of multiple metal ions using fixed-bed column are scarce. Very few adsorption studies reported for industrial effluent streams treatment. Only few researchers have carried out the parametric optimization studies. Need to develop a low-cost adsorbent from the naturally available waste material for the efficient removal of multiple metal ions. Required to optimize the activation conditions for the development of adsorbent. Exhaustive batch and continuous experiments are needed to be performed to evaluate the performance of developed adsorbent for metals removal. Mathematical Modeling like Adsorption Isotherm Models, Adsorption Kinetic Models, Mass Transfer Model, Conceptualization of the Model, Optimization was explained.



Day 3: Thursday (20/06/19)

Session-I

Speaker: Prof. S.A.Desai, Head, Chemical Engineering Department, TKIET Warananagar, Kolhapur.

Topic: Fluid Mechanics.

This session was focused on basic concept of Fluid Mechanics in Chemical Engineering. Mechanics: The oldest physical science that deals with both stationary and moving bodies under the influence of forces. Statics: The branch of mechanics that deals with bodies at rest. Dynamics: The branch that deals with bodies in motion. Fluid mechanics: The science that deals with the behavior of fluids at rest (fluid statics) or in motion (fluid dynamics) and the interaction of fluids with solids or other fluids at the boundaries. Fluid dynamics: Fluid mechanics is also referred to as fluid dynamics by considering fluids at rest as a special case of motion with zero velocity. A fluid is a substance in the gaseous or liquid form. Distinction between solid and fluid? Solid: can resist an applied shear by deforming. Stress is proportional to strain. Fluid: deforms continuously under applied shear. Stress is proportional to strain rate.



Session-II

Speaker: Mr. Jaydeep Katti, Additional General Manager, Berger Nippon Paint, Pune.

Topic: Energy and Environment.

People learned to use the chemical energy stored in materials like wood to cook and heat their homes. Energy use has changed a great deal since people relied solely on the sun, their own strong bodies or beasts of burden as energy resources. In the water transportation, people learned how to use water power to turn paddle wheels and wind power for transportation and irrigation. But machines and technologies introduced during the Industrial Revolution of the late 18th century required the use of other energy resources, especially fossil fuels.



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As an Environment point of view, recycle, reduce and reuse concept should be implemented. Chemical Process changes, Distillation, Cement, Tire and paints were carried in industry. Segregation of by products or waste, Product life cycle and Existing Solutions to reuse waste. In Energy conservation concept required highest point of swing, Maximum kinetic energy and maximum potential energy. Existing Solutions is required reuse waste, Smart City.

Day 4: Friday (21/06/19)

Session-I

Speaker: Dr. Satchidanand Satpute, Associate Professor, Chem. Dept. VIT Pune.

Topic: Flipped Classroom an effective way of teaching.

In this topic, Problems of students is on Lack of focus, Distraction, Disinterest. In Flipped Classroom, Example of Chemical Technology is the Requirement of Make your own video give in to student to see Discuss and do detailed analysis in class. The basic flowsheet with video description is given to students a day before. Asking students to do basic calculations for profit per year, how much difference you can make with saving 1 paisa per kg for the sulfuric acid production. Asking students to make flowsheet for absorber + converter + heat exchanger.



Session-II

Speaker: Dr. Somnath S. Nandi, Associate Professor, Dept. of Technology, Savitribai Phule Pune University

Topic: Modeling Simulation and Optimization in Chemical Engineering.

The benefits of optimization are the set of inputs which leads to desired / best output is obtained. Many times there might be several such solutions. It provides opportunity to decide on which operating condition to be followed. Reduces hit and miss strategy of experiments. The optimal solutions need to be verified experimentally and Optimization requires model inversion hence Modeling is the first step. This session explained the Need of modeling and its classification. Beauty of simulation is importance of error analysis. In some classical models complex phenomena i.e. cracking of hydrocarbons. In the Synthesize ideal nanomaterial with desired property is required Design of Experiments. The Application of nanomaterials to harness best benefits is Optimization requirement, Complexity of the process and Data based Model.



Session-III

Speaker:Dr. D.S.Bhatkhande, Professor, Chemical Engineering Dept, VIT Pune.

Topic:Water Treatment Technologies.

Water Usage and Demand in India of the total water usage is 92% - Agriculture, 5% - Domestic, 3% - Industrial. The overall water demand is supposed to increase from 552 BCM to 1050 BCM by 2025. Average urban water usage: 135 lit/person/day Demand from the industrial and domestic sectors is expected to increase with the growing population, urbanization and industrialization. 86% of population has access to improved water use Only 33% of population has access to improved sanitation. Aerobic bioprocesses are commonly used as the treatment is cheaper Many industrial organic chemicals are refractory – e.g. phenol. Specific micro-organisms are needed – culture is to be incubated and added to the recycled sludge. The waste may contain peroxide; pharmaceutical Industry waste may contain antibiotics – may be harmful to bioprocesses and needs to be treated prior to bioprocesses.



Day 5: Saturday (22/06/19)

Session-I

Speaker: Prof. U.S.Patil, Associate Professor & Head-Chemical Engineering Dept., PVPIT, Sangli

Topic: Understanding of Heat Transfer and Its Applications

Heat is the movement of thermal energy from a substance at a higher temperature to another at a lower temperature which is actually an energy. The amount of thermal energy that is transferred when two objects are brought into contact depends on the difference in temperature between the objects. Boilers and condensers in thermal power plants are examples of large industrial heat exchangers. Heat exchangers in our automobiles in the form of radiators and oil coolers. Heat exchangers are also abundant in chemical and process industries.



Session-II

Speaker: Dr. Aditya S. Abhyankar, HOD & Professor, Dept. of Technology, Savitribai Phule Pune University

Topic: Why research and Innovations.

This lecture was focused on A lot of innovation programs have naturally grown out of research and development groups, but most true innovation is a departure from what's come before so what role does the "research" in "research and development" play in innovation?. Research is an intrinsic aspect of the idea development process. Research helps guide numerous decisions that turn an idea into an innovation. There are some of the crucial points in the idea lifecycle when we have to perform quality research? Innovation is the most effective way of increasing the well-being of people. When countries and businesses invest in innovative products and services, people's wealth increase, the quality of their lives improve, and they can target their efforts towards bigger problems.



Session-III (Valedictory Function)

Speaker/Guest:

1. Dr.S.B.Devsarkar, Coordinator TEQIP-III, Dr. Babasaheb Ambedkar Technological University, Lonere, Raigad-MH.
2. Dr. V.S.Sathe, Professor, Controller of Examination, Dr. Babasaheb Ambedkar Technological University, Lonere, Raigad-MH.

In the valedictory session, Dr.S.B.Devsarkar, Coordinator TEQIP-III, Dr. Babasaheb Ambedkar Technological University, Lonere, Raigad-MH has given the concluding speech on “Refresher Course in Chemical Engineering and Technology”. In this speech, he informed about the importance of refresher course for new young Teachers/Professor in the field of teaching. Along with this Dr.S.B.Devsarkar explained about the role and importance of TEQIP-III in the field of Engineering and Technology.

The certificates were presented to all the participants of this workshop in hands of Dr.S.B.Devsarkar, Coordinator TEQIP-III and Dr. V.S.Sathe.



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