

Principal cum Chairman	:	Prof. S P Shahi
IQAC coordinator	:	Dr. Arun Kumar
Program Co-ordinator	:	Prof. Preety Sinha
Convener	:	Prof. TriptiGangwar
Co Convener	:	Dr. Sheerin Masroor Dr. Amrita Chakraborty Dr. Nisha Kumari

#### Organizing Committee

Dr. Ajay Kumar  
Dr. Seema Sharma  
Shri. Jyotish Kumar  
Sri Abhishek Kumar

Dr. Nupur Bose  
Dr. Ratna Amrit  
Dr. Nisha Kumari

Email Contact : [sinhapreety29@gmail.com](mailto:sinhapreety29@gmail.com)  
[triptigangwar312@gmail.com](mailto:triptigangwar312@gmail.com)

Whatsapp Contact no : +91-7739312008  
+91-9472239091

#### INTRODUCTION

The Chem Collective virtual lab is an online simulation of a chemistry lab. It is designed to help students link chemical computations with authentic laboratory chemistry. The lab allows students to select from hundreds of standard reagents (aqueous) and manipulate them in a manner resembling a real lab. Chem Collective virtual labs are part of National Science Digital Library (NSDL). Simulation-based exercises offer new ways to promote learning and motivation. Interactive exercises can allow students to explore and reinforce fundamental concepts that are increasingly complex, realistic and engaging.

- ❖ Self explanatory: uses simple language
- ❖ Audio-video: uses multi sensory approach
- ❖ Small duration: has been retention
- ❖ Learner-centered: learn at your own pace
- ❖ Simultaneous-based exercises offer new ways to promote learning and motivation.
- ❖ Interactive exercises can allow students to explore and reinforce fundamental concepts.



## A.N.College, Patna

(Patliputra University, Patna, Bihar)  
CPE Status by U.G.C.



spoken-tutorial.org

Accredited Grade "A" (3rd Cycle) by NAAC with C.G.P.A 3.27/4

### IQAC, A.N.College, Patna

Organizes

## Fifteen Day Student Development Programme

In Association with

Indian Institute of Technology, Bombay through Spoken Tutorial, Remote Learning (An Initiative of National Mission on Education through ICT, MHRD, Govt. of India)

On  
**Chem Collective Virtual Labs**

July 08 to July 22 ,2020

Registration Free of Cost.  
Registration link

<https://forms.gle/Gsku2TpMhmRYbzP8A>

Last Date of Registration :  
July 07,2020 till 11PM

E-Participation Certificate will be provided to the students by Spoken Tutorial, IIT, Bombay after conduction of evaluation test.

website : [www.ancpatna.ac.in](http://www.ancpatna.ac.in)

- ❖ Dilutions and pH measurements: Change in pH for solutions of acid and base on dilutions. Variation in pH by common ion effect for weak acid and bases. Use contextual menu to copy, paste and rename glassware.
- ❖ Density of solid and liquids: Measure densities of silver, rhodium and platinum using Archimedes principle. Measure densities of liquids with unknown concentration.
- ❖ Effect of temperature on solubility: Effect of temperature on solubility of salts. Check if solubility is exothermic or endothermic. Study the relationship between solubility and heat transfer. Use of foam cup.
- ❖ Acid-Base titrations: Standardization of the following solutions using titration methods, Strong Acid (HCl) with Strong Base (NaOH) and Strong Acid (HCl) with Weak Base (NH<sub>3</sub>).
- ❖ Buffer Solutions: To prepare 0.5 M acetate buffer of pH 3.6. Test the buffering action with small amounts of acid and base.
- ❖ Heat of Reaction: Determine heat change for neutralization reaction of sodium hydroxide (NaOH) and Hydrochloric acid (HCl).
- ❖ Metal Displacement Reactions: Perform experiments using VLabs to arrange the elements Cu, Mg, Zn, Pb and Ag from strongest to weakest reducing agents.
- ❖ Determination of Equilibrium Constant: Determine equilibrium constant for cobalt chloride reaction. Effect of temperature and concentration on equilibrium. Application of LeChatelier's Principle on the equilibrium.
- ❖ Determination of Solubility Product: Determine solubility of salts. Calculate solubility product of various sparingly soluble salts.
- ❖ Evaluation Test

- ❖ It helps students learn basic laboratory techniques without wastage of chemicals and breakage of apparatus.
- ❖ Students can review and learn chemistry concepts using virtual labs.
- ❖ They are useful where experiments involve risks to the health and physical integrity of learners.
- ❖ Virtual labs are cheaper, faster, less risky and more affordable than the real process.
- ❖ Empowerment: learn a new FOSS

#### WHO CAN APPLY:

Under Graduate students of Chemistry Honours and students of Botany, Physics, Mathematics and Zoology Honours having Chemistry as one of the subsidiary subjects.

### SCHEDULE OF PROGRAMME

ChemCollective Virtual Lab SDP contains a total of twelve tutorials, which will be completed in a span of 15 days. Language: English

## Part I

### Sharing of Videos, Study Material and Assignments

- ❖ Overview of Chem Collective VLabs.
- ❖ About Chem Collective VLabs software, Chem Collective VLabs offline interface features, menu bar, stockroom explorer, glassware menu, workbench and theme. Download and Installation of VLabs
- ❖ Preparation of standard solution: Prepare standard solution of 1 molar sodium chloride. Homework using ChemCollective VLabs. Use of glassware from default lab setup. Calculate molarity.