

# Department of Chemistry, St. John's College Anchal

## Certificate Course: "Analytical tools for industrial processes"

The Department of Chemistry, St. John's College Anchal is offering a 50-hour certificate course in "Analytical tools for industrial processes". This certificate course is industry and research-oriented programme to attract more chemistry-based industries in to our college for campus placements.

### Eligibility requirement

Undergraduates with Chemistry as major or optional subject.

**Course Start Date: 02<sup>nd</sup> May 2022**

### Course Content

- ⚡ *Chromatographic methods for purification of organic compounds*
- ⚡ *Spectroscopic methods for organic compound analysis*
- ⚡ *Electrochemical analysis for sensing, hydrogen evolution and corrosion analysis*
- ⚡ *Analysis of pesticides, soaps, detergents and fertilizers*
- ⚡ *Systematic Food analysis*
- ⚡ *Pharmaceutical compounds analysis*

### Hands own practice on

HPLC, TLC, GC, Impedance analysis, Tafel analysis, Cyclic Voltametric analysis, Chronoamperometric analysis, LSV analysis and UV spectroscopic analysis.

Data processing of XPS, TEM, XRD, BET, Electrochemical analysis etc.

### Infrastructural Facilities

Worldclass research lab

Classroom with multimedia projection

24x7 wi-fi facilities

Researchlab with HPLC, GC, Electrochemical workstation, AAS, UV –Visible spectroscopy, PH meter, Turbidity meter, Conductimeter, Potentiometer etc.

Central library and INFLIBNET services

## **Academic Excellence**

Experienced and highly qualified teachers

Well equipped laboratories

Ph.D. programmes

## **Other Facility**

Student placement Cell

Student association

## **Campus placement**

Department of Chemistry is interacting to provide placements after successful completion of the course in reputed industries and research organizations

## **Application and Admission**

The application form can download from the college website and filled application is submitted to email [chemistry@stjohns.ac.in](mailto:chemistry@stjohns.ac.in).

For any queries please contact Course coordinator:9995767819



## COURSE SUMMARY REPORT 2022-2023

Name of Course	Certificate Course on Analytical tools for industrial processes (CHE-CLI-22-001)
Course Duration	50 Hours
Department offering the Course	Department of Chemistry
Faculty In Charge	Arun P. S.
Number of Students Enrolled	13
Start Date & End Date	02/05/2022 to 05/11/2022

The certificate course on course on **Analytical tools for industrial processes (CHE-CLI-22-001)** has been coordinated by the Department of Chemistry, St John's College, Anchal. The course was specially designed to provide the theoretical and hands-on training on course on **Analytical tools for industrial processes**. The course had a well-defined syllabus and was approved by the IQAC. The certificate course was coordinated by Dr P. S. Arun, Assistant Professor, Department of Chemistry. The course was properly planned and organised to provide maximum support to students during their learning and hands on practice process. The course duration was 50 hours. Thirteen students enrolled for the program. The course started on 02.05.2022 and ended on 05.11.2022. During the end of course, a practical and theory examination was conducted. All students appeared for the examination. Final assessment was done based on the marks secured by them during the written and practical examination. All students passed in the examination. Certificates were also provided to them after the successful completion of the course.

  
Course Coordinator

  
Principal

St. John's College  
Anchal 691 306





**ST. JOHN'S**  
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Recognition for UG College by CBSE Govt. of India

LET THERE BE  
LIGHT  
FOR ALL MEN

## Analytical tools for industrial processes

Programme Code	:	CHE-CLI-22-001
Course level	:	Level 1
Department	:	Chemistry
Duration	:	50 hours (Under graduate from physics, chemistry and Biology)
College	:	St. John's College Anchal

### Description of the programme

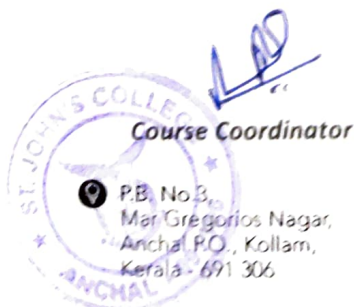
This programme produces highly qualified technicians in the key area of chemical laboratory analysis and instrumentation methods. Graduates will be specialized in the use of modern instrumental techniques to carry out chemical, pharmaceutical, drug, food and environmental analysis. It also constructs and improves on the students' knowledge of Laboratory analysis, instrumentation methods and Laboratory Management. This course provides a well-balanced qualification required by industries in the Pharmaceutical, Food and Environmental Industries. Areas of expertise include Chemical Analysis, Environmental Monitoring, and Pharmaceutical Formulation & Quality Management & Control for all laboratory roles. There is an equal emphasis on academic learning and practical hands-on experience, vital for immediate participation in a working environment. The major project component included in this course provides key skills to allow the graduate to participate in Research and Development.

### **Syllabus**

*The course components are treated in lectures, exercises, mandatory laboratory sessions and reports.*

### Modules:

1. **Chromatographic methods for purification of organic compounds:** TLC, TLC plate preparation and sample analysis, HPTLC, Ion exchange, Ion chromatography (Working Applications in separation, purification and identification) HPLC, Gas Chromatography (types of columns, packed columns, Capillary columns, Sillanization, Bonded phase columns, Advanced applications)



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2. **Spectroscopic and microscopic methods:** Infrared spectroscopy, advantages of Fourier Transform (FTIR), NMR, Mossbauer, ESR, UV-Visible, mass spectroscopy, AAS, X-ray analysis and electron spectroscopy (surface analysis): EDAX, SEM, TEM, XPS.
3. **Chemical & Instrumental Analysis:** Electroanalytical Measurements Voltage, Impedance, OCP, Tafel analysis, Cyclic voltametric analysis, Potentiometric titrations of fruit juices, Conductometric titrations of fruit juices/food samples.

### Special Topics:

#### 1. Analysis of pesticides, soaps and detergents, fertilizers

Classification of pesticides. Analysis of different pesticides by classical and instrumental methods. Classification of soaps and detergents with suitable examples. Characterization of soaps and detergents. Types of fertilizers and analysis of different elements like, nitrogen, phosphates, calcium, sodium, potassium and ammonia.

#### 2. Food Analysis

Introduction to food analysis, Adulteration of fats and oils; milk and milk products. regulations and international standards related to food analysis, nutritional labeling, sample and sample preparation. Compositional analysis of foods for moisture, proteins, fat, fiber, ash, vitamins and minerals.

#### 3. Pharmaceutical Compound Analysis

Introduction to softwares for Drug Designing, Instrumental and titrimetric assays for anti-diabetic, anti-cancer, anti-tuberculosis, anti-malarial, anti-hypertensive and anti-HIV drugs based on USP/BP/IP. Heavy metal ion, Dissolution, Loss on drying and Karl fisher analysis in pharmaceuticals. Importance of UV-Visible spectrophotometry, IR spectroscopy and HPLC with UV, fluorescence and photodiode array detection in pharmaceutical industry.

### Opportunities

This is valuable bridge course between academics and industry it will help the students to get job in industries as QC Analyst, Analytical Chemist, Laboratory Manager also improve research skills.

  
Course Coordinator

  
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SHINE BEFORE  
MEN

## Module 4(8hours)

### Online resources for research

Introduction to online chemical database search, Searching and downloading research papers using keywords in Scopus, Libgen, semanticscholar, , Microsoft Academic Research and google scholar, reaction search, product search, reactant search, structure search, search using Sci-finder,web of science. Introduction Plagiarism

## Module 5 (8 hours)

### Reference managing softwares/Introduction to Citation Management

Mendeley- Introduction, download and installation process. Insertion of references and bibliographies into Microsoft Word documents using Mendeley Cite, Mendeley desktop. . Creation of Mendeley Library Adding references Searching and organizing references Reading and annotating documents Importing content from the web, Generating citations and bibliographies, Syncing, Exporting references, Sharing references

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**Principal**

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