

A Proposal for Food Chemistry Lab

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I. Objectives of the Virtual Lab

To study the analytical procedures for characterizing the properties of foods constituents and their interactions that affects the quality and stability of foods

II. List of experiments

1. Analysis of water for potable and food purposes
2. Moisture content in foods in relation to their stability
3. Non-enzymatic browning reactions and its determination
4. Determination of rate/ extent of hydrolysis of sucrose/starch
5. Determination of free fatty acid content in fats and oils
6. Detection and estimation of oxidative rancidity in fats/oils
7. Determination of heat stability of vitamin C
8. Study of some reactions of proteins
9. Study of some processing changes in proteins
10. Study of some functional properties of proteins

III. Target group of users

- UG (1st Year/ 2nd Year) [highest priority for development]
- UG (3rd Year/ 4th Year) [next higher priority for development]

IV. Mapping of proposed lab with AICTE courses as per [attached list](#) of potential labs

- Food Chemistry and KFT 402

V. Mapping of proposed lab with universities (minimum 3 universities)

- AKTU, Lucknow; KFT452; B. Tech. Food Technology
- HBTU, Kanpur; TFT357; B. Tech. Food Technology
- Tezpur University, Aasam; FE 205; B. Tech. Food Technology
- Anand Agricultural University; FQA 112; B. Tech. Food Technology
- CFTRI Mysore; FT 001; B. Tech. Food Technology
- NIFTEM, Haryana; FST 211; B. Tech Food Science & Technology
- Sant Longowal Institute of Engineering & Technology, Longowal, Punjab; PCFT-515; B.E. Food Engg & Technology
- Guru Jambheshwar University of Science and Technology, Hisar; FT201-P; B. Tech: Food Technology

- Guru Nanak Dev University, Amritsar; FST-205; B. Tech: Food Technology
- Islamic University of Science & Technology, Pulwama, Jammu & Kashmir; DFT191C; B. Tech: Food Technology

VI. Expected timelines

Presentation of proposal to domain experts' committee – 31st March 2022

Demo of First 3 Expts and Review – 30th June 2022

Demo of 5-6 Expts and review – 31st August 2022

Demo of 7-10 Expts and review – 31st October 2022

Final demo of 7-10 Expts – 15th November 2022

Hosting of lab (7-10 Expts) – 30th November 2022

Note 1: The [LDC](#) will coordinate the [reviews](#) and [hosting](#)

Note 2: The lab is supposed to be developed and hosted within 6 - 9 months from the date of approval

VII. Budget (Max. Rs 2 Lakhs per experiment with a ceiling of Rs 20 Lakhs per Lab)

Table I. Budget for <Food Chemistry Lab>

S. No.	Equipment/Activity	Budget # (In Rupees)
1	Laptop / Machine(computer/laptop)	2.70
2	Manpower(project engineer/scientist)	4.80
3	Consumables (various materials including Autoclave, Oven, PH Meter, Chromatography assembly/ analyzer, Refractometer, Moisture Analyzer, Titration assembly etc)	4.00
4	Contingency (Standardization of DCPIP Dye solution, Orbital Shaker for gentle and intensive mixing of biological and chemical compounds, spectrometric analysis of the given samples etc)	4.00
5	Honorarium for Lab Developer (Rs 20k per experiment; Ceiling of Rs 2 Lakhs per lab)	2.50
6	Miscellaneous	2.00
TOTAL		20 Lakhs

To be released based on the recommendation of the review committee

Note: Institute overheads not to be included in the budget

VIII. Justification of the budget requirements

- Details of Laptop/Machine
[A laptop/computer will be required for data-keeping.](#)
- Details of Manpower (number, cost per man-months etc.)

- i. Total man-months required
project staff
- ii. No. of project staff, cost per man-months
project engineer/scientist (~Rs. 40k per month)
- iii. Honoraria for other staff associated with the project
 - i. Honoraria for Faculty developing the Virtual Lab: (A maximum of Rs. 2 lakhs honorarium for the developers & Rs. 25k for reviews)
 - ii. Honoraria for Other staff associated with the project
Rs. 25k honorarium for the associated staff

(c) Details of Consumables

Procurement of various materials including Autoclave is a large pressure cooker, it is a moist sterilization unit, Hot air Oven, PH Meter, Chromatography assembly/ analyzer, Refractometer, Moisture Analyzer, Titration assembly etc

(d) Details of Miscellaneous cost

- i. Internal Review (Optional, Rs 1000 per experiment)
- ii. Field Trials - N.A.-
- iii. Others - N.A.-

IX. Student Feedback and Learning

- How will you collect feedback and use them?
 - i. We will collect feedback through feedback (online/offline) form and workshops
 - ii. There is also an associated email id for providing feedback
 - iii. An expansion or additional explanation will be added if the need arises
- What is the actual learning component provided by the Virtual Lab?

The learning component includes that student will study the analytical procedures for characterizing the properties of foods constituents and their interactions that affect the quality and stability of foods
- After the Virtual Lab experience, would the student be able to perform the experiment in the real lab?

Yes, after the Virtual Lab experience, the student can perform the experiment in the real lab

ANNEXURE-I

Important information for the development of Virtual Labs

(A Virtual Lab consists of 7-10 experiments)

X. Link to some sample virtual labs

<https://python-iitk.vlabs.ac.in/> <https://cs-iitd.vlabs.ac.in/> <https://plchla-coep.vlabs.ac.in/>

XI. Technology Used

- We will use HTML, CSS and Java Script for front-end design (free and open source)
- For Back-end we will use JSON (Free and open-source Software)

XII. Required Components for virtual experiments

- Step by step procedure similar to a physical lab will be drafted for the virtual lab
- Online manual with aim/objective and underlying theory
- Pre-test for understanding current status of user
- Simulator for learning the concept of food technology
- Post-test questions to check the understanding of student after using virtual lab
- Related resources (web & NPTEL lectures)
- Additional help/feedback