INNOVATIVE TEACHING METHODOLOGIES

Department of Biotechnology
Ramaiah Institute of Technology
Bengaluru-560054

In accordance with the institutional policy of the Ramaiah Institute of technology (RIT), the department of biotechnology has adopted the outcome-based education (OBE) for teaching learning process. The OBE model ensures well defined articulated, and validated learner centric approaches where course outcomes have been developed for every topic they learn and eventually the course outcomes are mapped to Program outcomes (Pos).

Innovative teaching methodologies as listed below have been implemented for effective teaching learning process

1. **STUDENT CENTRIC LEARNING**
   - ➤ Design of OBE based curriculum
   - ➤ Continuous internal evaluation (CIE)

2. **PEDEGOGY FOR INNOVATIVE TEACHING AND LEARNING**
- ➤ Demonstration based learning
- ➤ Project based learning
- ➤ Experiential and participative learning
- ➤ ICT support system for teaching and learning
- ➤ Reproducibility / reusability & Peer review process

3. **EFFICIENT FEEDBACK SYSTEM**
4. **SUPPORT SYSTEM FOR SLOW AND FAST LEARNER**

1. STUDENT CENTRIC LEARNING:

Student centric innovative learning is primarily aimed to implement effective teaching learning processes for efficient implementation of outcome-based education (OBE).

Various strategies have been adopted for development, assessment, and validation of student centric activities such as:

➢ **Design of OBE based curriculum**

➢ **Continuous internal evaluation (CIE)**

The curriculum is developed in accordance with reputed universities/ institutions (VTU/AICTE/ UGC etc). Feedback on curriculum is also obtained from suitable stakeholders (Industry/ alumni/ domain experts) as illustrated in **Fig.No-1**.

The curriculum is reviewed periodically by board of study members (BOS) and they provide critical input. The respective faculty implement these changes by following formal formats (MSRIT-F700B) as shown in **Fig.No-2.**
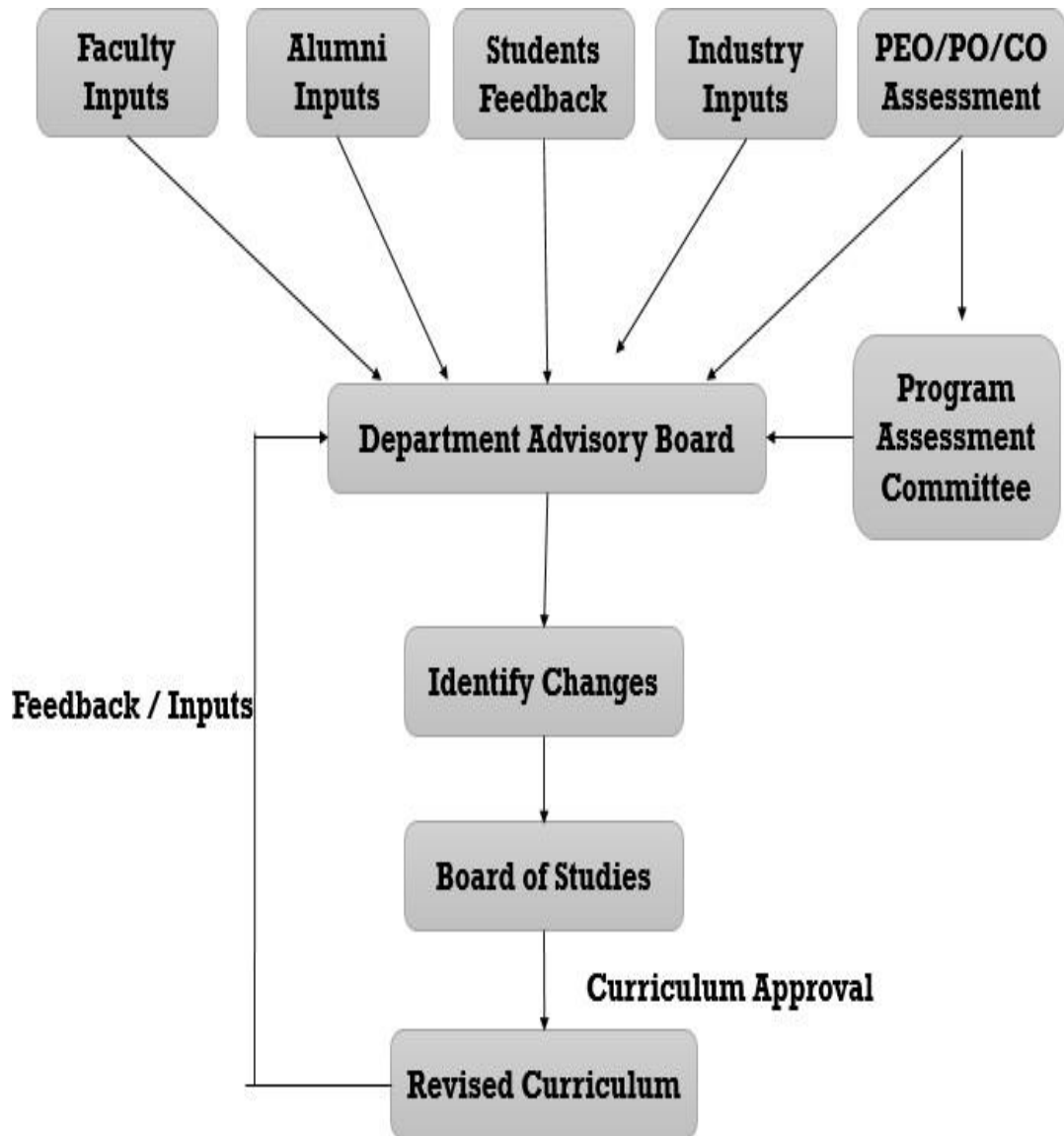
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┌──────────┐  ┌──────────┐  ┌──────────┐  ┌──────────┐  ┌──────────────┐
│ Faculty  │  │  Alumni  │  │ Students │  │ Industry │  │  PEO/PO/CO   │
│ Inputs   │  │  Inputs  │  │ Feedback │  │  Inputs  │  │  Assessment  │
└──────────┘  └──────────┘  └──────────┘  └──────────┘  └──────────────┘
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Faculty Inputs · Alumni Inputs · Students Feedback · Industry Inputs · PEO/PO/CO Assessment

Department Advisory Board ← Program Assessment Committee

Feedback / Inputs

Identify Changes

Board of Studies

Curriculum Approval

Revised Curriculum

Fig.No-1 Design of OBE based curriculum

4

MSRIT	PROCESS MANUAL (LEVEL II)	REV NO.: 0
DOC CODE	TITLE: DESIGN INPUT CUM REVIEW RECORD	DATE 24.01.2013
MSRIT. F700A	REF: MSRIT.F002 CURRICULUM DESIGN PROCESS	PAGE 1of 1

M S RAMAIAH INSTITUTE OF TECHNOLOGY, BANGALORE - 560054
DESIGN INPUT CUM REVIEW RECORD

Department: Biotechnology   **For the Academic Year:** 2021-2022   **Semester:** B.E-VII

Subject and subject code: Medical Biotechnology, BTE752

Base input document is previous semester's syllabus / Lesson Plan / Teaching Diary if it is continuity

Sl. No.	Inputs recognized	Reference to records
1	Merging of infectious diseases and vaccine technology, COVID19	
2	Cancer stem cells, neural stem cells	
3	Next generation sequencing.	
4	chromosome based diagnostics	Books
5	Protein based diagnostics	
6	Cancer gene therapy	
	Induced pluripotent stem cells	

Review Record

Issue Discussed	Decision	Responsibility	Target Date
Proposed contents have been discussed.	Accepted in BOS meeting	Elective Subject	VII semester

Date of Review: 20-03-2021

Participants: Dr. Chandra Prabha M. N (Chairperson), Prof. Paturu Kondaiah (IISc), Prof. Utpal S. Tatu (IISc), Dr. Nagendra, (Sir.MVIT& VTU Nominee), Dr. Manjunath Ramarao, (BMS Biocon), Mr.Shreyans Modi (Biocon & Alumnus),. Dr. Bindu S (RIT), Dr. Dhamodhar P. (RIT), Dr. Ahalya N (RIT) & Dr. T.P Krishnamurthy (RIT).

Signature of Chairman of BOS with date
Prof. & Head
Department of Biotechnology
Ramaiah Institute of Technology
MSR Nagar, MSRIT Post

MSRIT	PROCESS MANUAL (LEVEL II)	REV NO.: 0
DOC CODE	TITLE: DESIGN REVIEW CUM VERIFICATION RECORD	DATE 24.01.2013
MSRIT. F700B	REF: MSRIT.F002 CURRICULUM DESIGN PROCESS	PAGE 1of 1

M S RAMAIAH INSTITUTE OF TECHNOLOGY, BANGALORE - 560054
DESIGN REVIEW CUM VERIFICATION RECORD

Department: Biotechnology   **Semester:** VII   **For the Academic Year:** 2021-2022

Subject and subject code: Medical Biotechnology, BTE752

Participants: Dr. Chandra Prabha M. N (Chairperson), Prof. Paturu Kondaiah (IISc), Prof. Utpal S. Tatu (IISc), Dr. Nagendra, (Sir.MVIT& VTU Nominee), Dr. Manjunath Ramarao, (BMS Biocon), Mr.Shreyans Modi (Biocon & Alumnus),. Dr. Bindu S (RIT), Dr. Dhamodhar P. (RIT), Dr. Ahalya N (RIT) & Dr. T.P Krishnamurthy (RIT).

Date of Review: 20-03-2021

Verification Decision – Accepted.

References:

1. Ben Hu, Hua Guo et al., (2021) Characteristics of SARS-CoV-2 and COVID-19, Nature Reviews Microbiology, 19, 141-154
2. Mary Clarke, Jonathan Frampton (2020) Stem cells-Biology and application, 1st edition, Taylor and Francis Publisher
3. Albert Sasson, (2006) Medical Biotechnology, Brookings Institution Press.
4. Keith Wilson & John Walker, (2000) Practical Biochemistry- 5th Edition, Cambridge University Press, UK.
5. Judit Pongracz, Mary Keen (2009) Medical Biotechnology 1st Edition, Churchill Livingstone Publications.
6. Daan Crommelin, Robert D Sindelar (2013) Pharmaceutical Biotechnology an Introduction for pharmacists and pharmaceutical scientists, Springer Publisher

*New syllabus copy is enclosed.

Signature of Chairman of BOS with date
Prof. & Head
Department of Biotechnology
Ramaiah Institute of Technology
MSR Nagar, MSRIT Post
Bengaluru-560 054

Fg.No. 2: Sample screen shot representing MSRIT-F700B form

➤ **CONTINUOUS INTERNAL EVALUATION (CIE)**

- CIE ensures the successful implementation of OBE based curriculum. The theory and practical performance were measured via CIE based performance and it also set their eligibility criteria to attend semester end examination (SEE).

- The CIE are strictly adhered with blooms taxonomy (L1 to L5), which facilitates students level of understanding. The outline of CIE based evaluation is as shown in following **Fig.No.3.**

- The overall assessment includes classroom assessment in the form of assignment/quiz, tutorial sessions for problem solving skills, internal assessment exams and semester end examination.

- Faculties follow defined rubrics for assessment of other components of continuous evaluation exams (CIE). Assignment topics allotted for students at generally not related to the regular curriculum, they are assigned in such a way that topic motivates them to search relevant information using online or offline scientific logistics.

- A prototype sample topics and **Fig.No.4(a)** evaluation sheet is attached **Fig.No.4(b).** The continuous internal evaluation of other components.
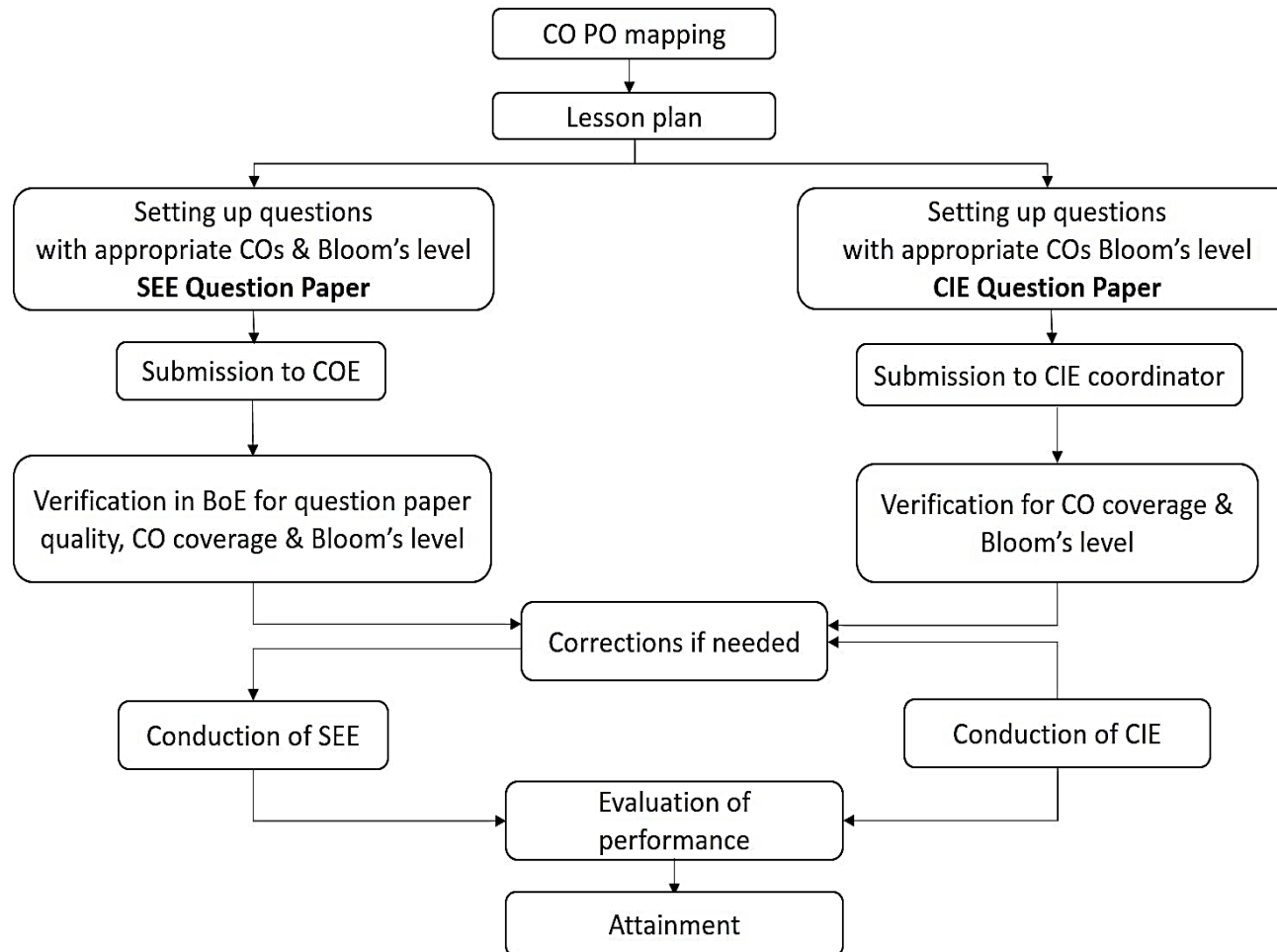
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                        ┌─────────────────┐
                        │  CO PO mapping  │
                        └────────┬────────┘
                                 ↓
                        ┌─────────────────┐
                        │   Lesson plan   │
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   ┌────────────────────────┐          ┌────────────────────────┐
   │   Setting up questions │          │   Setting up questions │
   │ with appropriate COs & │          │ with appropriate COs   │
   │    Bloom's level       │          │    Bloom's level       │
   │   SEE Question Paper   │          │   CIE Question Paper   │
   └───────────┬────────────┘          └───────────┬────────────┘
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   │   Submission to COE    │          │ Submission to CIE coordinator│
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   │ Verification in BoE for│          │ Verification for CO     │
   │ question paper quality,│          │ coverage &              │
   │ CO coverage & Bloom's  │          │ Bloom's level           │
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   │   Conduction of SEE    │          │   Conduction of CIE    │
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Fig.No-3 The CIE & SEE evaluation process

Fig.No.4(a): Sample screen short representing different assignment topic(s) distribution to class

Rubrics for Evaluation of Forensic Science (BTE641) Assignment

Topic: "Forensic Case study"

Marks allotted: 10 marks

Instructions:
- should include more than two techniques or branches of forensic biology to solve a case in detail, no need to discuss theory
- Each student needs to submit individual reports on the respective forensic case study topic of their choice. (no group projects)
- Minimum no of pages is 6 sheets excluding cover page. There is no restriction for maximum no of pages.
- A neatly designed cover page with all necessary details should be included.
- Content carries 80 % of your marks and formatting carries 20 % of your marks .
- Retain Font size 12, Times new Roman for the main text. Apart from this, the document should be neatly formatted to match a technical report.
- Marks will be definitely deducted for late submission.

Deadline: Submit on or before 1.7.2022 (Friday) before 4 pm.

Rubrics for Evaluation

Information (Total 8 marks)	Marks
Collection of information	1
Compiling of information and its flow	1
Analysing the data	2
Interpretation of results	2
Writing Conclusion in your own words	1
No. of supporting documents pertaining the case study (Figures, Real time Pictures, Graphs)	1
Formatting (Total 2 marks)	
Appropriate font size and font style ; Line spacing and Line alignment	1
Design of cover page, Figure legends	1
Total	**10**

Signature of the Course Faculty

RAMAIAH Institute of Technology

Department of Biotechnology, Ramaiah Institute of Technology.

Assignment report

Title of the Assignment topic:

Name of the Candidate :

USN :

Subject & code			
	Rubrics for evaluation		
Submission	2 marks		
Contents	5 Marks		
Reference and citation	3 Marks		
	Total Marks Obtained		

Signature of the student with date

Signature of the faculty with date

(c)

(d)

Fig.No.4(a): Sample screen short representing rubrics used for evaluation of Assignment topics.

2. PEDEGOGY FOR INNOVATIVE TEACHING AND LEARNING

Demonstration based learning

Demonstration-based learning rigorously adopted in the curriculum to impart basic or complex concept related to theory, practical or research-based projects. Few examples related to demonstration-based learning listed below

- ➢ Rainwater harvesting system prototype as shown in **Fig. 5(a).**

- ➢ HPLC stimulation model for RT/ RTV determination **Fig. 5(b)**.

- ➢ Demonstration of ADMET model: To orient key stages of drug biotransformation process **Fig. 5(c).**
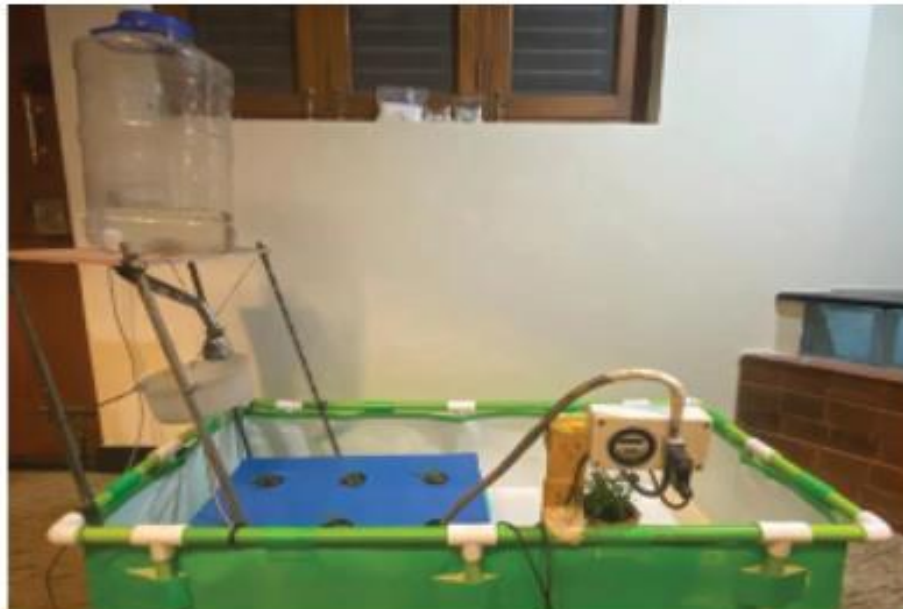
Fig.No.5(a): Rainwater harvesting prototype
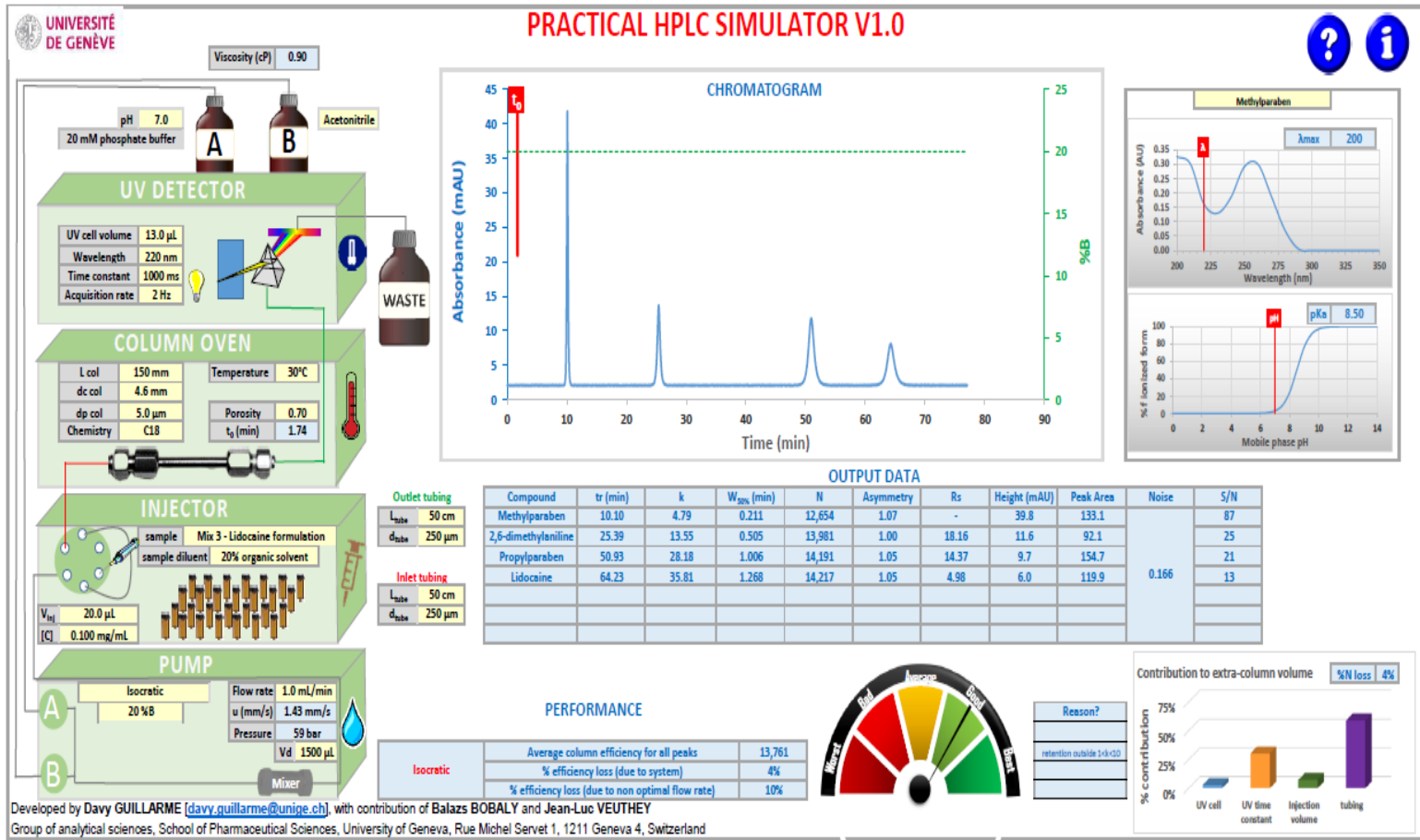
Fig.No.5(b): HPLC stimulation for demonstration learning.
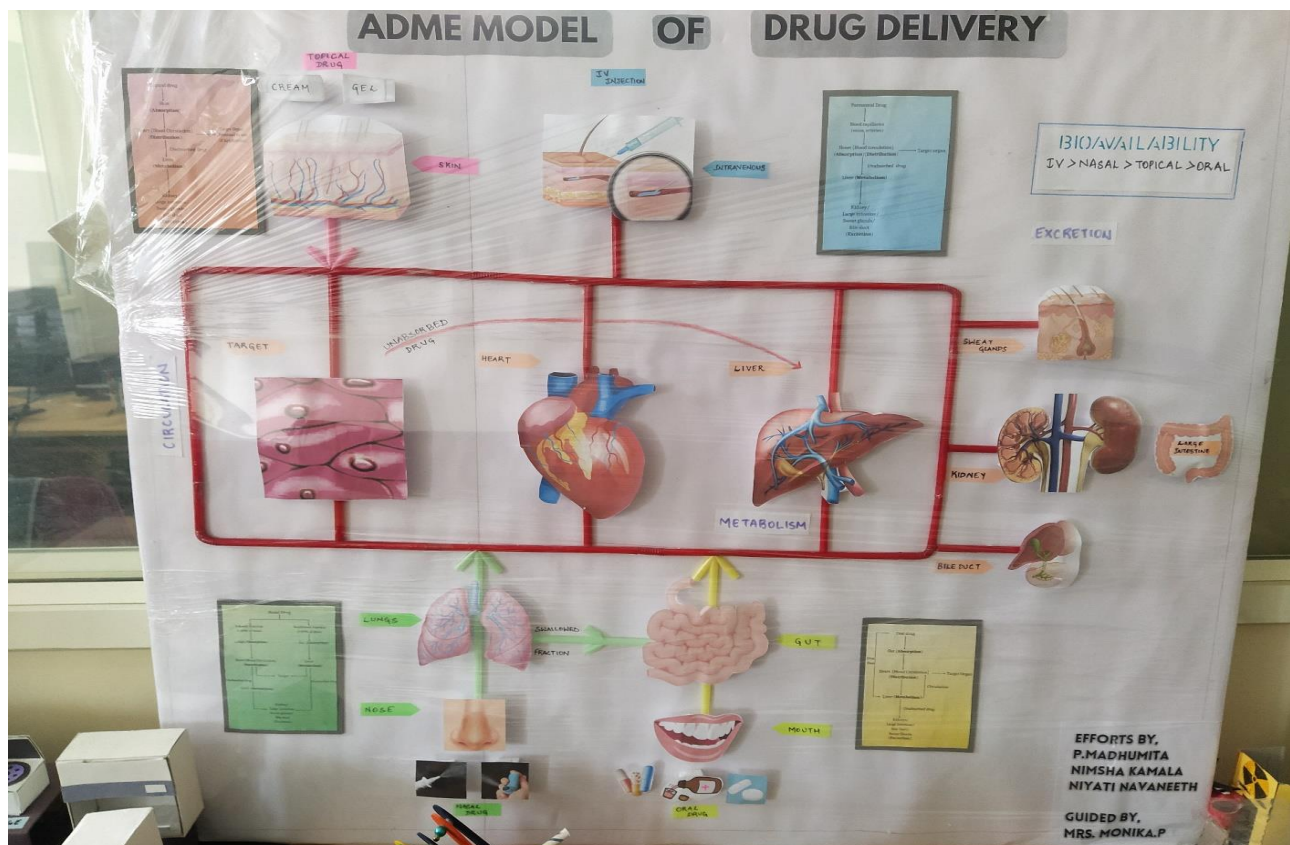
Fig.No.5(c): ADME model for demonstration based learning.

Project based learning:

> ➤ Project based leering provides opportunity for students to understand real world problems and work towards potential solutions, which would be useful for society, industry, and research applications.

> ➤ Students are motivated to take semester break vocational training / internship. Many received Summer Research Fellowship from INSA, JNCR, Bangalore, among others. **(Fig. No. 6)**

> ➤ Project based learning motivate UG students to undertake hobby projects/ research projects which imparts them essential skill sets in specific domain along with publications as show as Screen shot **Fig. No.7**

Fig.No. 6: Fellowships/ Summer Internship certification

1. Sidharth Saxena, T P Krishna Murthy, Chandrashekhar CR, Layan S Patil, Abhinav Aditya, Rohit Shukla, Arvind Kumar Yadav, Tiratha Raj Singh, Mahesh Samantaray, R Amutha (2022) A Bioinformatics approach to the identification of novel deleterious mutations of human TPMT through validated screening and molecular dynamics. Scientific Reports 12, 18872. *Impact Factor: 4.996*

2. Sidharth Saxena, **T P Krishna Murthy**, Vivek Chandramohan, Sai Achyuth B, Maansi, Papiya Das, Sineagha V, Sriraksha Prakash (2022) *In silico* analysis of deleterious single nucleotide polymorphisms of PNMT gene associated with Parkinson's disease. Molecular Simulations. 48 (16), 1411–1425. https://dx.doi.org/10.1080/08927022.2022.2094922 *Impact Factor: 2.03*

3. Afraa Aqeel Zackria, Ramya Pattabiraman, **T P Krishna Murthy**, S Birendra Kumar, Blessy Baby Mathew, Vinai George Biju (2021) Computational Screening of Natural Compounds from *Salvia plebeia* R. Br. for Inhibition of SARS-CoV-2 Main Protease. Vegetos, 35, 345–359. https://doi.org/10.1007/s42535-021-00304-z *Scopus Indexed*

4. Afraa Aqeel Zackria, Bala Mohan Sivani, Priyanka Venkatesh, Ramya Pattabiraman, S Birendra Kumar, Parasuraman P, **T P Krishna Murthy**. (2022) In silico screening of Natural compounds from Curcuma amada Roxb for inhibition of Helicobacter pylori: Molecular docking, dynamics and ADMET studies. International Journal of Pharmaceutical Research, 14 (1), 124-141. https://doi.org/10.31838/ijpr/2022.14.01.020 *Scopus Indexed*

5. Nilofer Gerald Arakal, Vaishali Sharma, Avinash Kumar, Kavya B, Devadath N G, Birendra Kumar, **Krishna Murthy T P**, Manikanta Murahari. (2021) *Ligand-based design approach of potential Bcl-2 inhibitors for cancer chemotherapy.* Computer Methods and Programs in Biomedicine, 209 (September), 106347. *Impact Factor: 5.428*
https://doi.org/10.1016/j.cmpb.2021.106347

6. S Birendra Kumar, Swati Krishna, Sneha Pradeep, Divya Elsa Mathews, P Ramya, Manikanta Murahari, **Krishna Murthy T P. (2021).** Screening of Natural Compounds from *Cyperus rotundus Linn* against SARS-CoV-2 Main Protease: An Integrated Computational Approach. Computers in Biology and Medicine, *134* (July), 104524. https://doi.org/10.1016/j.compbiomed.2021.104524 *Impact Factor: 4.589*

7. S Birendra Kumar, P Parasuraman, **Krishna Murthy T P**, Manikanta Murahari, Vivek Chandramohan. (2021). *In silico* screening of therapeutic potentials from *Strychnos nux-vomica* against the dimeric Main protease (Mpro) structure of SARS-CoV-2. Journal of Biomolecular Structure & Dynamics. 40 (17), 7796–7814.
https://doi.org/10.1080/07391102.2021.1902394 Scopus and WOS Indexed

8. Bala Mohan Sivani, Priyanka Venkatesh, **T P Krishna Murthy**, S Birendra Kumar. (2021). In silco screening of antiviral compounds from *Moringa oleifera* for inhibition of SARS-CoV-2 Main Protease using computational approaches. Current Research in Green and Sustainable Chemistry. 4 (2021) 100202. https://doi.org/10.1016/j.crgsc.2021.100202 *Scopus Indexed*

9. **T P Krishna Murthy**, Trupthi Joshi, Shivani Gunnan, Nidhi Kulkarni, Priyanka V, S Birendra Kumar (2021) *In silico* Analysis of *Phyllanthus amarus* Phytochemicals as Potent Drugs Against SARS-CoV-2 Main Protease. Current Research in Green and Sustainable Chemistry, 4, 100159. https://doi.org/10.1016/j.crgsc.2021.100159 *Scopus Indexed*

Fig.No. 7: Screen shot of hobby project research publications.

Experiential & Participative learning:

- The experimental learning process facilitates students to learn modern laboratory tools to improve their analytical thinking capabilities and its practical implications for academics, higher learning or entrepreneurship/ startups.

- Visits to industries / incubation center/ startups as shown in **Fig. No. 8** orients students about recent ongoings and motivates them to fetch exposure from real life applications.

- Partial delivery or courses or invited talk from experts from industry and reputed institutes motivates student to gain add on information which will be useful to build their futuristic endeavors (academic / research / industrial career) as show in **Fig. No. 9**

- The participative learning process such as NPTEL, COURSERA, SWAYAM related courses add to their curricular credentials and help them in their higher studies **(Fig.No.10)**

Fig. No. 8: Industry visit by student and faculty members

Fig. No. 9: Partial delivery of courses and invited talk from external experts.
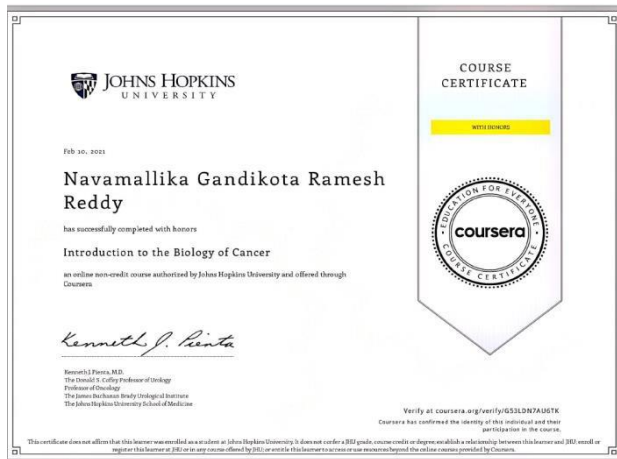
Fig. No. 9: Add on courses (NPTL, Coursera) acquired by students

19

ICT supported learning:

➢ Many faculty members of the department uses directly or indirectly use ICT tool for efficient teaching learning process as summarized in **Table No.1**

➢ For laboratory-based courses the virtual lab mode has been used to demonstrate laboratory-based experiments as shown in **Fig.No.10**

➢ *Google meet/Google Classroom***:** Faculty utilize the Institute adopted commercial subscription of Google meet to conduct virtual classes sample schedule attached **Fig.No.11.** The video recording option enable students to have access to pre-recorded sessions. Google Classroom is used to streamline the process of sharing files between teachers and students, distributing, and grading assignments.

➢ *Zoom communication*: Alternatively Zoom communication platform have been used by the faculty members of the department for an efficient teaching learning process.

➢ *Edmodo:* Edmodo is an online tool with several user-friendly options such as sharing and review of course contents, assignments etc. Faculty members use this platform for conduction on online test, quiz and evaluation of student performance as screen shot attached **Fig.No.12**

➢ *Impartus:* The Institute subscribes to Impartus, which provides a lecture capture solution that enables automatic audio-video
screen shot attached **Fig.No.13**

Table.No.1: Consolidated information related to innovative teaching tool used by faculty

Name of the Faculty Member	Contineo video Lecturing Classes (Y: Yes)	Experiential and participant tive learning (Y: Yes)	Online Classes (G-meet, Zoom etc) (Y: Yes)	Online Class Material Upload on Institutional website (Y: Yes)	Animation / PPT / Any other relevant tool used (Y: Yes)	Online Evaluation (Edmodo/Google Microsoft form) (Y: Yes)	Virtual labs and Feedback (Y: Yes
Dr Chandra Prabha MN	Y	Y	Y	Y	Y	Y	
Dr. Bindu S		Y	Y	Y	Y	Y	
Dr. Dhamodhar	Y	Y	Y	Y	Y	Y	
Dr Ahalya N	Y	Y	Y	Y	Y	Y	
Dr. Y.S. Ravikumar	Y	Y	Y	Y	Y	Y	
Dr. Prabha.M.	Y	Y	Y	Y	Y	Y	Y
Dr. Lokesh.K.N	Y	Y	Y	Y	Y	Y	Y
Dr. Samrat K	Y	Y	Y	Y	Y	Y	Y
Mr. M. Gokula Krishnan	Y	Y	Y	Y	Y	Y	
Dr. Bhavya S.G		Y	Y	Y	Y	Y	
Dr. T.P. Krishna Murthy	Y	Y	Y	Y	Y	Y	Y
Dr. Abhijith S.R.	Y	Y	Y	Y	Y	Y	Y
Dr. Roshni Ramachandran	Y	Y	Y	Y	Y	Y	
Dr. Priyadarshini	Y	Y	Y	Y	Y	Y	Y
Dr. Sharath R		Y			Y		
Dr. Sravanthi V.	Y	Y			Y		

FRICTION IN PIPES

Objective:

To determine the friction in pipes.

Apparatus used:

Pipes having different diameter connected to a differential manometer, a collecting tank, stopwatch, scale.
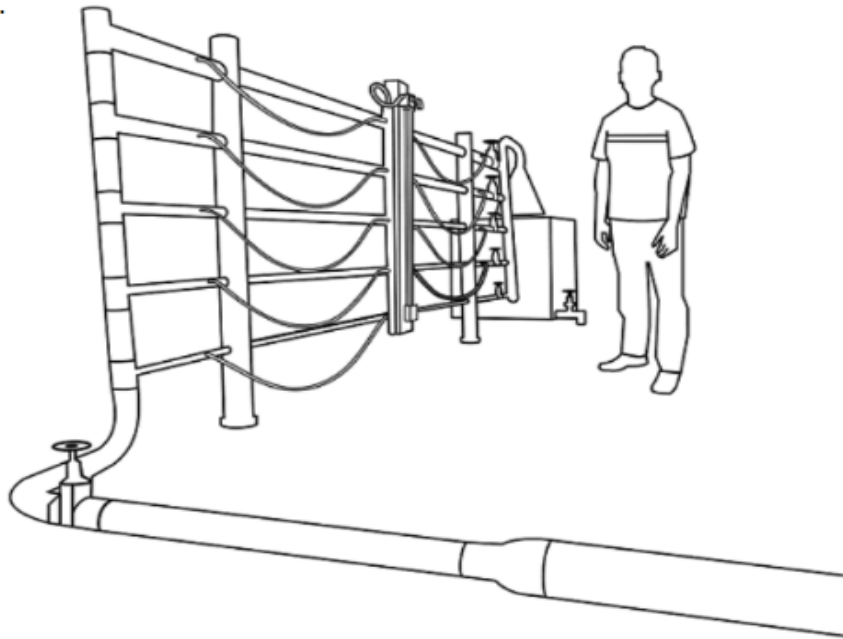
Fig. No. 10: Virtual lab conduction
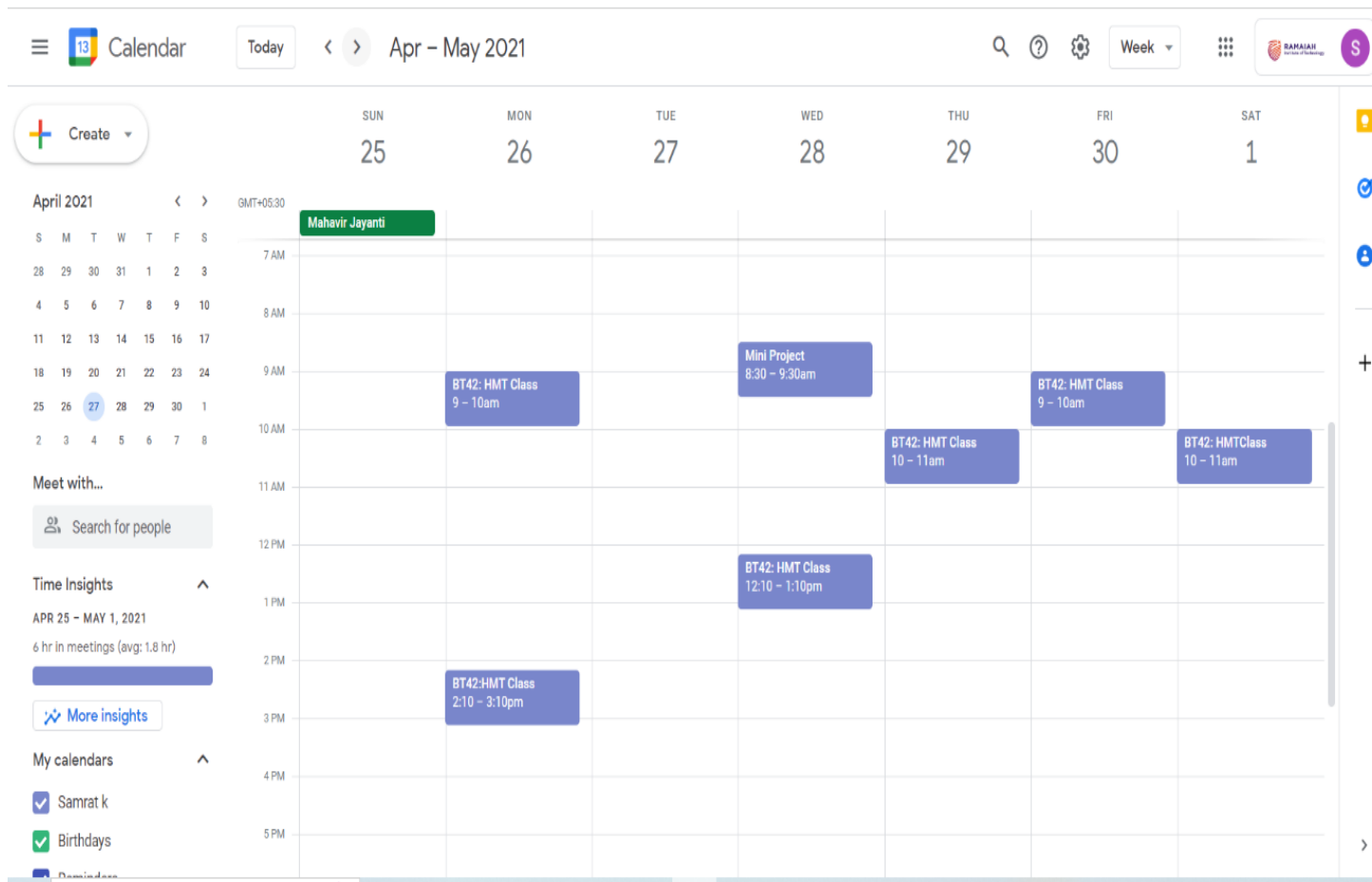
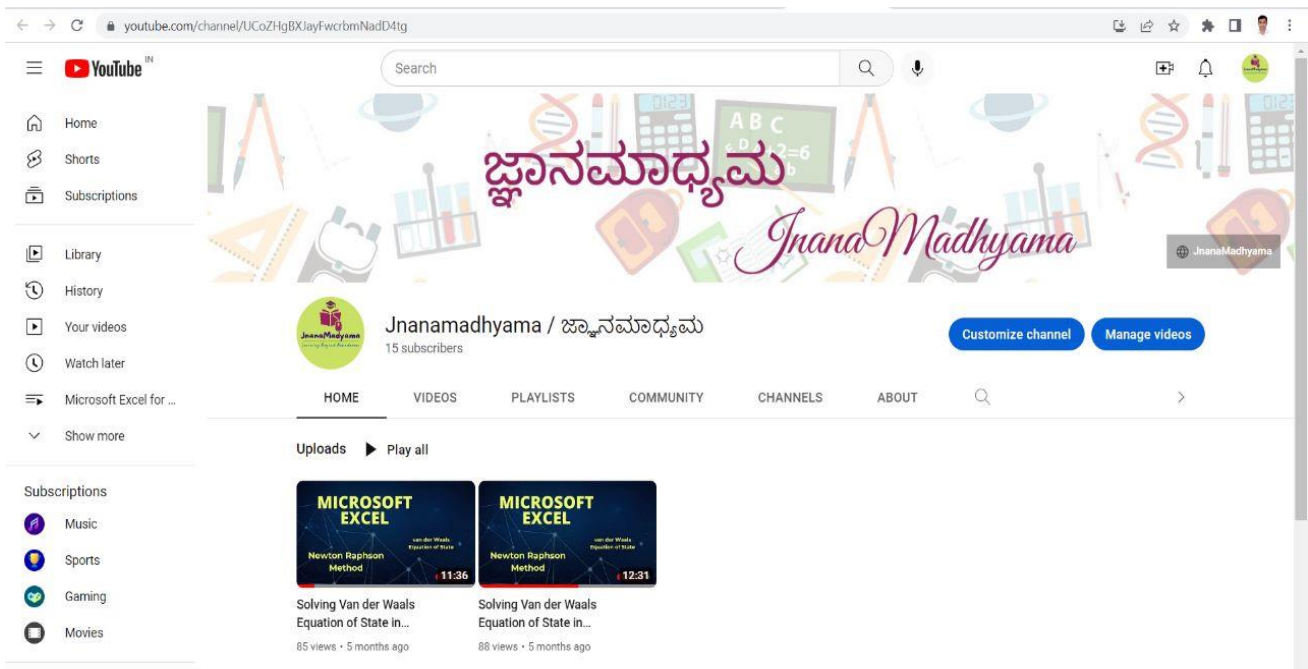**Fig. No. 11:** G-Meet schedule
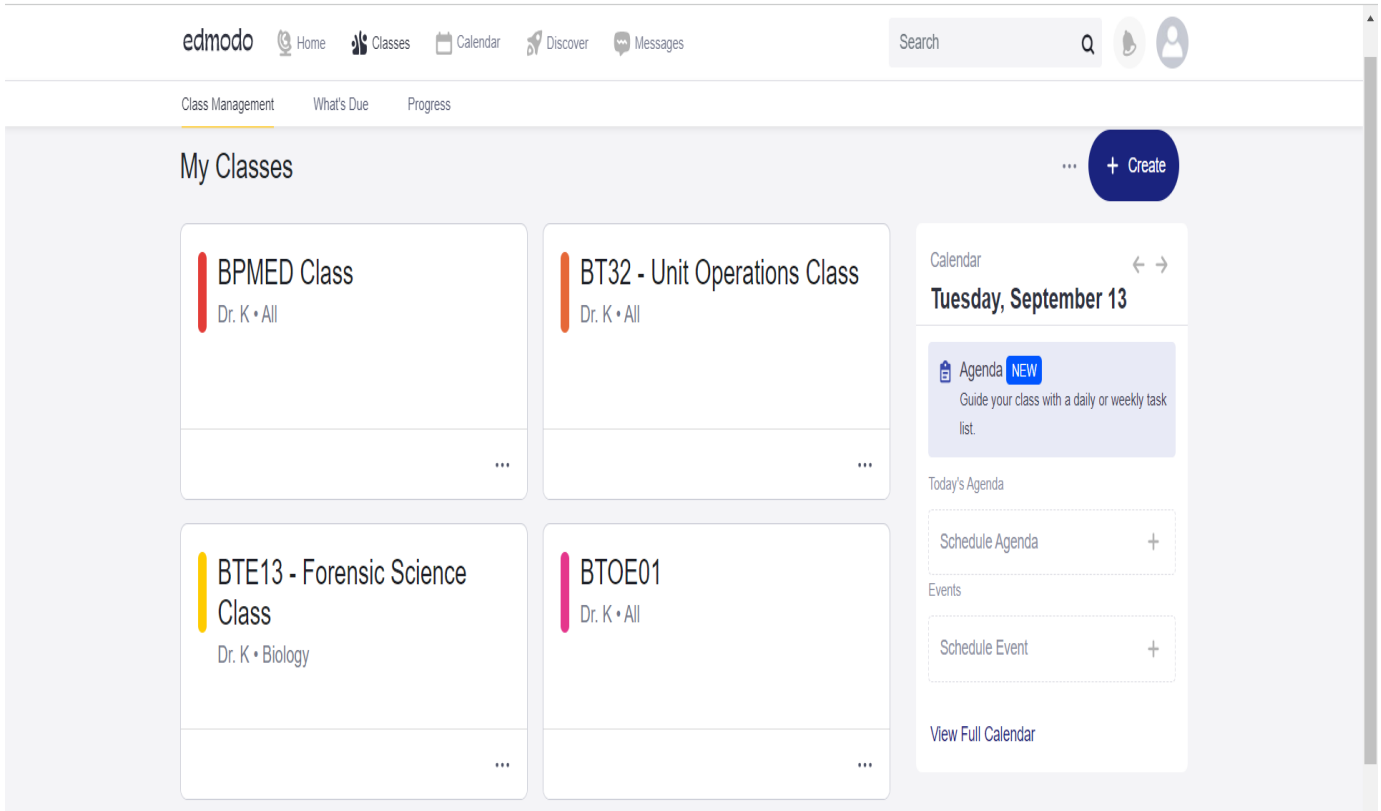
Fig. No. 12: Edmodo lecture material database

Fig. No. 13: Impartus video recording database

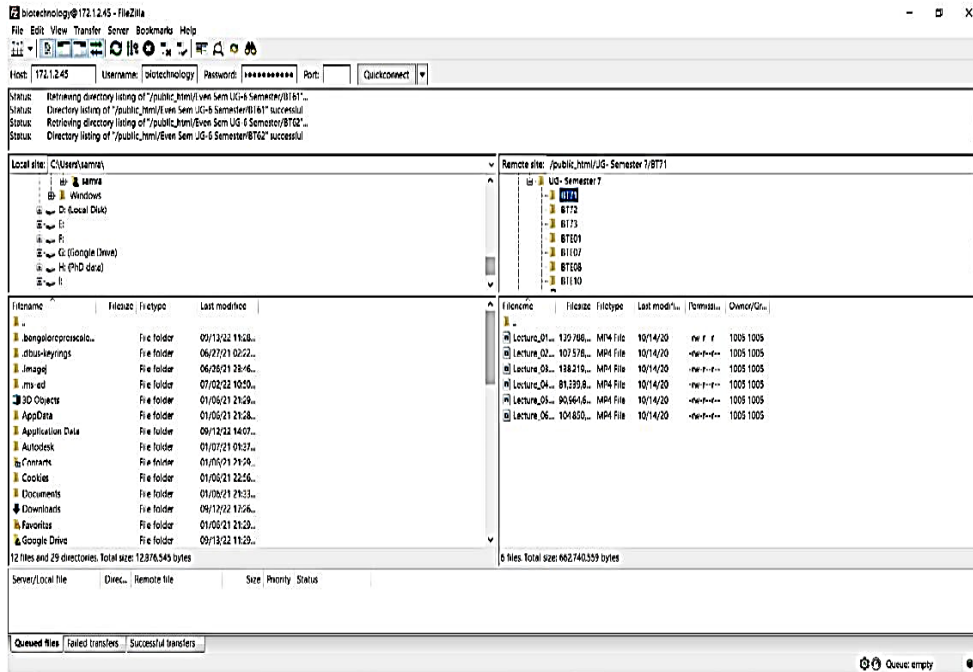3. **REPRODUCIBILITY & REUSABILITY OF RESOURCES AND PEER REVIEW PROCESS**:

➤ The faculty members and department students are actively involved in using available resources as part of the continuous or advanced teaching-learning process.

➤ For example, the Impartus video lecture platform is used to record and distribute the resources to the students for current academic use or repository purposes as shown in screen shot **Fig.No. 14(a)**

➤ Institute is also enrolled for National Digital Library of Indian (NDLI), which provides an extensive resource to the students and faculties such as textbooks, articles, video lectures, question papers etc., which provides a perfect platform of reusability of resources.

➤ The course contents related to different subjects are available for the student in form of recorded Impartus video lectures or faculty YouTube channels or FileZilla online repository system as show in in **Fig.No. 14(b, c),** respectively for reusing or reviewing during examination time.

➤ The department of Biotechnology home page provides subject wise link for theory and practical courses contents which are available at following link: https://www.msrit.edu/study-material/biotechnology.html as shown as Screen shot **Fig.No14.(d)**

(a)

(b)

(c)

Department of BIOTECHNOLOGY

RAMAIAH Institute of Technology
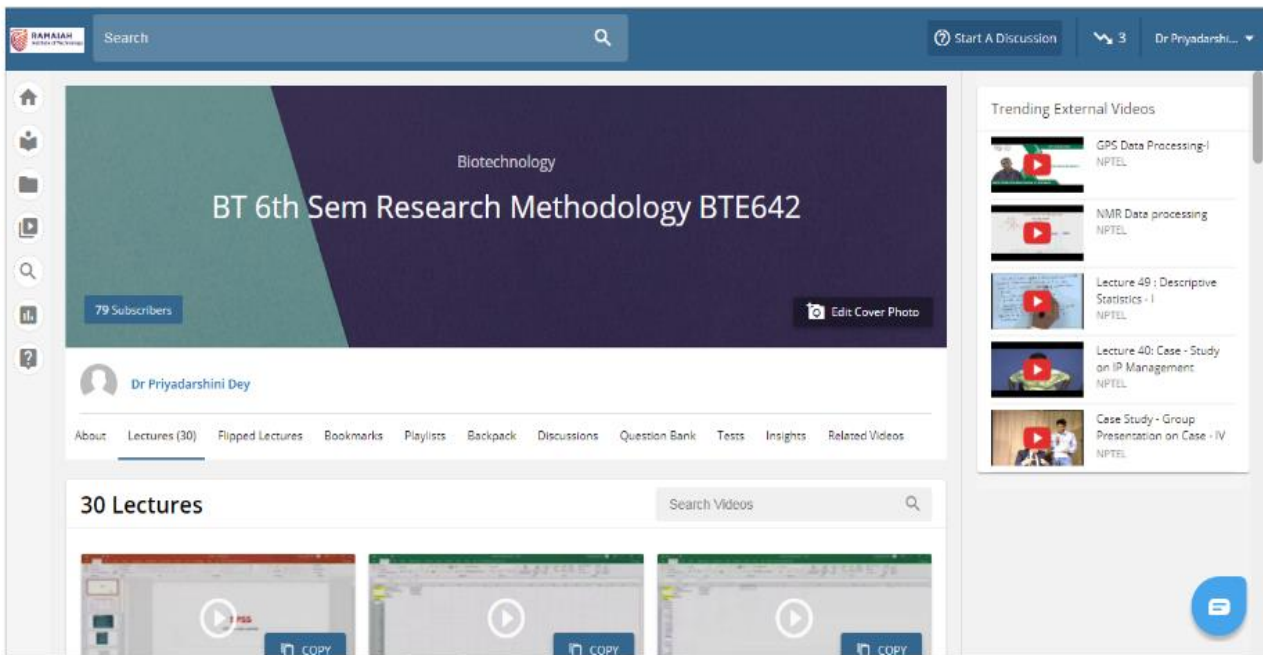
E-Content for Theory Courses

Programme: B.E. Biotechnology

Course Code	Course	Link
SEMESTER-IV		
BT42	Heat and Mass Transfer	Click here
BT43	Biochemical Thermodynamics	Click here
BT44	Genetics & Genetic Engineering	Click here
BT45	Bioanalytical Techniques	Click here
BT46	Biophysics & Structural Biology	Click here
SEMESTER-VI		
BT61	Enzyme Technology	Click here
BT62	Upstream and Downstream Process Technology	Click here
BT63	Bioprocess Control and Automation	Click here
BTE04	Food Biotechnology	Click here
		Click here
BTE05	Metabolic Engineering	Click here
SEMESTER-VIII		
BTE13	Forensic Science	Click here
BTE14	Research Methodology	Click here
Open Elective		
BTOE01	Principles of Food Processing and Preservation	Click here

(d)

Fig.No.14 (a-d): Screenshot depicting course content repository for review and reusability (a) Impartus, (b) YouTube channel, (c) FileZilla repository (d)E-contents of course material

28

4. **EFFICIENT FEEDBACK SYSTEM**

➢ As a part of innovative teaching learning process efficient feedback system enables the faculty at Department of Biotechnology to amend or improvise the existing teaching learning process.

➢ The feedback received through the stakeholders like employers, alumni, parents, industry experts, researchers in academia enhances the teaching learning process and contributes to improving the curriculum.

➢ The following links are used for to amend or to improve the existing OBE based as shown in Table.No-2

➢

Table.No-2: List of link used to obtain feedback from different stakeholder

Feedback link	Semester
Alumni Survey:	https://forms.gle/Lo2vu5ypQqpZqins5
Parents Survey:	https://forms.gle/qPgzoLPiivMwURwVA
Graduate Survey/Student Survey:	https://forms.gle/9ftiFi5hasSADJ5m9
Virtual Lab (BTL48):	https://forms.gle/CMvUzHuWA9qvSjhU6
Employers Survey:	https://forms.gle/1YvPgoTDuZwURkyk9

➤ Course end survey is conducted to check whether the course outcomes are achieved. A set of questions are designed based on the course outcomes to conduct the survey for each course (both theory and practical). A sample of the feedback form/ response sheet attached as shown **Fig No.15 (a)** The results obtained will be part of the indirect survey and will assist the faculty in identifying the gaps in CO attainment and take necessary action

➤ Students' feedback was collected for further improvement of mode of delivery for ease of review of online class contents. A sample feedback of curriculum and virtual lab as show in **Fig.No. 15(b)**

(a)

Virtual Lab Feedback Form - Unit Operations Lab (BTL48)
48 responses

Experiments Performed
48 responses

- Friction in Pipes — 12 (25%)
- Venturimeter — 13 (27.1%)
- Both the above — 39 (81.3%)
- Diffusion of organic vapour in air — 1 (2.1%)
- Single tray dryer — 1 (2.1%)
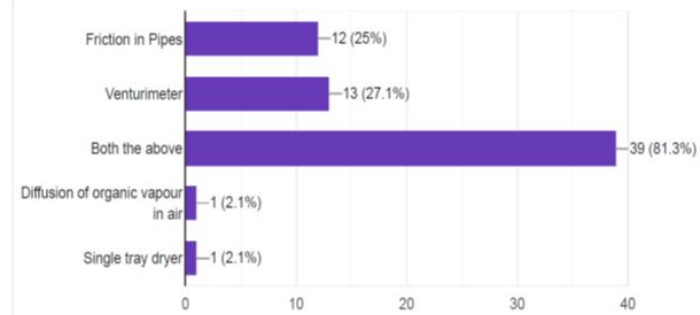
Please tell your agreement with the following

Legend: Excellent, Very Good, Good, Average, Needs improvement

- To what degree was the actual lab enivronment simulated
- The theory and Procedure were found to be helpful
- The results of simulation/experiment were easily
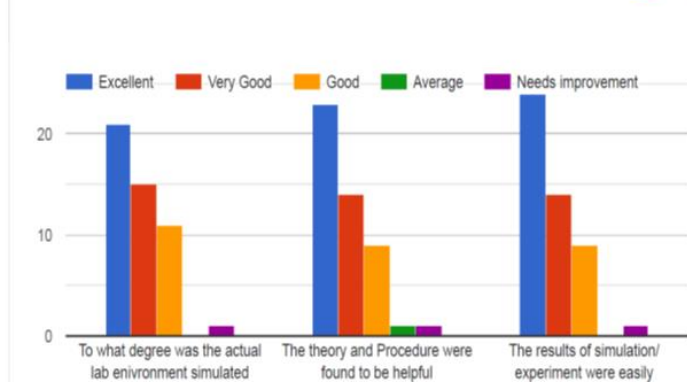
Please answer the following questions

Legend: Yes, No

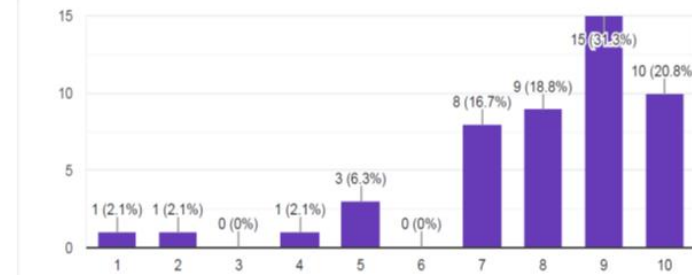- Did you ge...
- Did you re...
- Could you...
- Could you...
- Do you thi...
- Do you thi...
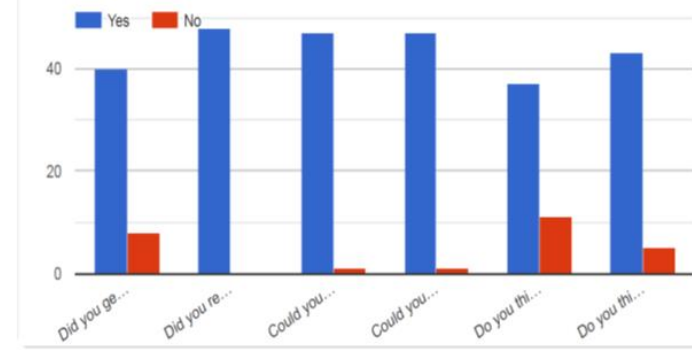
How would you rate the experience of using virtual labs to conduct experiments (On a scale of 1 to 10 where 1 being minimum and 10 being maximum)
48 responses

- 1 — 1 (2.1%)
- 2 — 1 (2.1%)
- 3 — 0 (0%)
- 4 — 1 (2.1%)
- 5 — 3 (6.3%)
- 6 — 0 (0%)
- 7 — 8 (16.7%)
- 8 — 9 (18.8%)
- 9 — 15 (31.3%)
- 10 — 10 (20.8%)

(b)

Fig.No.15a-b: Feedback for course end survey (a) and virtual lab Feedback form.

31

5. SUPPORT SYSTEM FOR SLOW AND FAST LEARNERS

➤ As a part of teaching learning process substantial support system enables slow leaner to improve their curricular activity and provides additional credentials for faster learner.

➤ The student support system for slow learners and fast learners adopted by the Department is shown in **Fig. No .16**
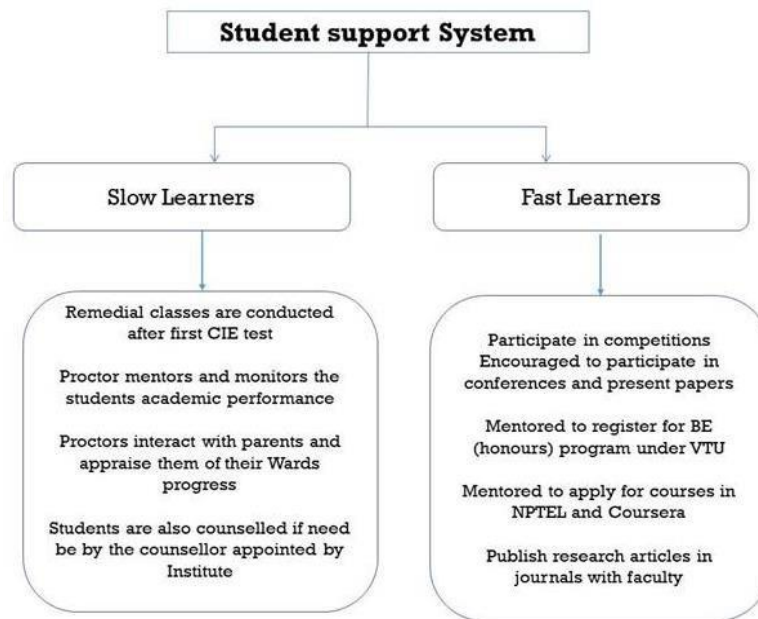

Fig.No. 16. Student support system for fast and slow learners.

➤ The fast learner or students with CGPA actively take up NPTL as an add on certification course. Student also enrolled and awarded with reputed INSA, JNCASR and International fellowship as shown screen shot **Fig.No. 16**

Fellowship	Name of the student	Batch/USN	Institution	Term
INSA	Nimsha Kamala	2019-2023	Rajarajeshwari Medical College, Bangalore	June-August 2022
	Shivani Gunnan	2017-2021	IISER, Mohali	June-August 2020
	Sivani Bala Mohan	2017-2021	North-Eastern Hill University, Shillong	June-August 2020
	Priyanka V	2017-2021	Amity Institute of Molecular Medicine and Stem cell Research, Uttar Pradesh	June- August 2019
	Jyothi Guruprasad	2017-2021	CSIR-Indian Institute of Toxicology Research, Uttar Pradesh	June- August 2019
	Pallavi AM	2016-2020	IISC, New Delhi	June- August 2019
	Shruthi M	2016-2020	National Institute of Plant Genome Research, New Delhi	June- August 2019
	Hashvitha R	2016-2020	IISER, Kolkata	June- August 2019
	Disha Suresh	2016-2020	ALM Post graduate Institute of Basic Medical Sciences, Chennai	June- August 2019
	Ankita Jha	2016-2020	National Institute of Immunohematology, Maharashtra	June- August 2019
JNCASR SRFP	Srujana Kulkarni	2016-2020	ACTREC, Mumbai	June- August 2019
	Vidhyashree V	2016-2020	Indian Institution of Science Education and Research, Tirupati	June- July 2019
International Internships	Sharanya R	2017-2021	University of Manitoba, Canada, USA	June-August 2020
	Jaanaki Raghunath	2017-2021	Millipore Sigma, Bedford Massachusetts, USA	June-August 2019

Fig.No. 16 : Screen shot of Fellowship and International internship award list