



Facility Usage Statistics and Revenue Generated by ACMS Facilities (2014-26)

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Head, ACMS

Annexures: Usage Statistics of ACMS Facilities

Usage Statistics for individual facilities at ACMS can be accessed by going through the Annexures that are accessible in the link:

https://drive.google.com/drive/folders/1oBU-vI6mxOpjozYtcSW-BvojIauZY_9I?usp=sharing

Annexure I: ACMS Facility Usage Revenue Datasheet (all labs)

Annexure II: Usage Statistics Electron Microscopy Lab (EML)

Annexure III: Usage Statistics XPS Facility (XPS)

Annexure IV: User Statistics X-Ray Diffraction Facility (XRD)

Annexure V: Usage Statistics Mechanical Testing Lab (MTL)

Annexure VI: Usage Statistics Optical Profilometry Facility (OPF)

Annexure VII: Usage Statistics Indentation Lab (IL)

Annexure VIII: Usage Statistics Thermal Processing Lab (TPL)

Annexure IX: Usage Statistics Magnetism Lab (ML) Facility

Annexure X: Usage Statistics Electrical Characterization Lab (ECL)

Annexure XI: Usage Statistics Live Cell Imaging (LCI), Sample Preparation Lab (SPL); XRF-IRMS Facility

Financial Summary: Key Highlights

Revenue Contributed to ACMS
Lab Development Account (LDA)

Source: Facility Usage Fee from
IITK Users

₹ 285.43 Lakhs

Revenue Contributed to ACMS
Testing Accounts

Source: Facility Usage Fee
from Non-IITK Users

₹ 226.21 Lakhs

Total Revenue Generated: ₹ 5.12 Crore

FINANCIAL SUMMARY

ACMS have demonstrated strong financial performance from their inception in 2014 to till date (June 2026). They have generated a total revenue of **₹ 512 Lakhs** (from usage fee from both internal as well as external user bases).

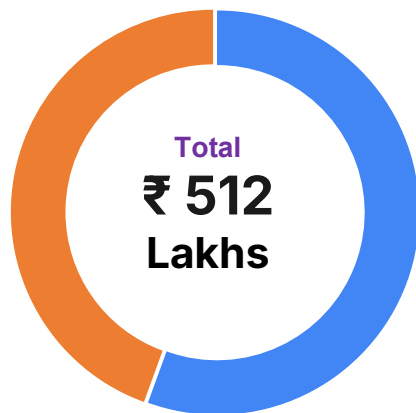
This revenue generation has directly supported ACMS quest for self-sustenance. They have contributed to DoRD Establishment a total amount of **₹ 75 Lakhs** as overheads from the Testing Fee contributed from External (non-IITK) users.

Overall Financial Summary

External Testing

₹ 226.2 Lakhs

44.3% of total



IITK Users (LDA)

₹ 285.4 Lakhs

55.7% of total

Revenue Generated from ACMS LDA and Testing Account				
	Lab Name	Revenue from IITK Users (LDA)	Revenue from Non-IIT K Users (Testing Account)	Contributed to R&D
		[in Rs. Lakhs]	[in Rs. Lakhs]	[in Rs. Lakhs]
1	Electron Microscopy Lab (EML)	81.24	34.55	11.40
2	Surface Charact. Lab (XPS)	35.63	110.61	36.50
3	X-Ray Diffraction Lab (XRD)	29.67	11.90	3.93
4	Mechanical Testing Lab (MTL)	13.58	38.77	12.79
5	Optical Profilometry Lab (OPL)	4.11	2.25	0.74
6	Indentation Lab (IL)	8.47	6.34	2.09
7	Thermal Processing Lab (TPL)	9.14	9.40	3.10
8	Magnetics Lab (ML)	2.91	9.46	3.12
9	XRF-IRMS Lab (XRF)	59.96	7.41	0.00
10	Sample Prep Facility (SPL)	1.12	0.00	0.00
11	Live Cell Imaging (LCI)	35.77	0.00	0.00
12	Electrical Charact. Facility (ECF)	3.82	3.46	1.14
	Grand Total of all labs	285.42	226.21	74.82

For ACMS revenue datasheet please refer **Annexure I**

Contribution to DoRD Establishment from ACMS Revenue Overhead

ACMS Labs	LDA Revenue	TESTING-A/c Revenue	Shared with DoRD towards DoRD Establishment
Major Contributors	<i>In Rs. Lakhs</i>	<i>In Rs. Lakhs</i>	<i>In Rs. Lakhs</i>
EML	81.24	34.55	11.40
XPS	35.63	110.61	36.50
XRD	29.67	11.90	3.93
MTL	13.58	38.77	12.79
TPL	9.14	9.40	3.10
Other Labs*	116.18	20.97	6.92
Total	285.43	226.21	75.00

* **Other Labs** include: OPF, IL, ML, XRF-IRMS, LCI, ECF, SPL

The consolidated amount of approx. ₹ 75 Lakhs has been contributed to DoRD establishment till date from the usage fee of the various facilities in ACMS.

Electron Microscopy Lab (EML)

EML FACILITY

CONVENERS:

PROF. SHASHANK SHEKHAR
PROF. KAUSTUBH KULKARNI (MSE)

Internal Revenue (LDA): 81.24 Lakhs

External Revenue (Testing A/c): 34.55 Lakhs

Rs. 11.40 Lakhs

**Total contribution towards DoRD
establishment from EML as overhead**

ACMS LDA and Testing Account Revenue				
Lab Name	Faculty Convener	Year	Revenue generated from IITK Users (LDA)	Revenue generated from Non-IIT K Users (Testing Account)
			In Rs. Lakhs	In Rs. Lakhs (after tax. deduction)
Electron Microscopy Lab (EML)	Dr. Shashank Shekhar & Dr. Kaustubh Kulkarni	2014	1.10	0.74
		2015	4.36	1.50
		2016	5.77	3.55
		2017	2.94	7.66
		2018	9.76	2.55
		2019	11.66	2.88
		2020	2.40	7.88
		2021	10.08	1.68
		2022	3.81	1.58
		2023	6.83	0.20
		2024	13.44	2.37
		2025	5.97	0.20
		2026 (till June26)	3.14	1.77
		Total	81.24	34.55

For usage statistics of EML facility please refer *Annexure II*

Surface Characterization Facility (XPS)

XPS FACILITY

CONVENERS:

PROF. T.G. GOPAKUMAR (CHM)
PROF. GOUTHAMA (MSE) [Previous]

Internal Revenue (LDA): 35.63 Lakhs

External Revenue (Testing A/c): 110.61 Lakhs

Rs. 36.50 Lakhs

**Total contribution towards DoRD
establishment from XPS as overhead**

ACMS LDA and Testing Account Revenue				
Lab Name	Faculty Convener	Year	Revenue generated from IITK Users (LDA)	Revenue generated from Non-IIT K Users (Testing Account)
			<i>In Rs. Lakhs</i>	<i>In Rs. Lakhs (after tax. deduction)</i>
Surface Characterization facility (XPS)	Dr. Gouthama	2014	0.88	0.64
		2015	2.46	2.89
		2016	1.51	12.21
		2017	2.78	17.72
		2018	5.28	23.31
		2019	4.25	18.00
	Dr. Gopakumar	2020	3.37	7.07
		2021	2.29	11.55
		2022	1.64	6.77
		2023	5.47	6.44
		2024	5.71	4.01
		2025-26	0	0
		Total	35.63	110.61

For usage statistics of XPS facility please refer *Annexure III*

X-Ray Diffraction Lab (XRD)

XRD FACILITY

CONVENER:

PROF. NILESH PRAKASH GURAO (MSE)

Internal Revenue (LDA): 22.67 Lakhs

External Revenue (Testing A/c): 11.90 Lakhs

Rs. 3.93 Lakhs

**Total contribution towards DoRD
establishment from XRD as overhead**

ACMS LDA and Testing Account Revenue				
Lab Name	Faculty Convener	Year	Revenue generated from IITK Users (LDA)	Revenue generated from Non-IIT K Users (Testing Account)
			In Rs. Lakhs	In Rs. Lakhs (after tax. deduction)
X-Ray Diffraction Lab (XRD)	Dr. Nilesh Prakash Gurao	2015	2.62	0.98
		2016	2.36	1.00
		2017	1.68	1.03
		2018	5.02	2.08
		2019	6.17	1.61
		2020	1.99	0.63
		2021	1.97	0.47
		2022	1.98	0.72
		2023	1.71	1.30
		2024	2.07	0.99
		2025	1.71	0.65
		2026 (till June26)	0.39	0.45
		Total	29.67	11.90

For usage statistics of XRD facility please refer **Annexure IV**

Mechanical Testing Lab (MTL)

MTL FACILITY

CONVENERS:

PROF. SUDHANSHU SHEKHAR SINGH (MSE)
PROF. SHASHANK SHEKHAR (MSE) [Previous]

Internal Revenue (LDA): Rs. 13.58 Lakhs

Ext. Revenue (Testing A/c): Rs. 38.77 Lakhs

Rs. 12.79 Lakhs

**Total contribution towards DoRD
establishment from MTL as overhead**

ACMS LDA and Testing Account Revenue				
Lab Name	Faculty Convener	Year	Revenue generated from IITK Users (LDA)	Revenue generated from Non-IITK Users (Testing Account)
			In Rs. Lakhs	In Rs. Lakhs (after tax. deduction)
Mechanical Testing Lab (MTL)	Dr. Shashank Shekhar	2015-16	0.68	0.08
		2016-17	0.5	0.32
		2017-18	0.97	2.78
		2018-19	0.92	3.96
		2019-20	1.06	4.12
		2020-21	0.72	4.92
	Dr. Sudhanshu Shekhar Singh	2021-22	1.94	6
		2022-23	1.65	4.65
		2023-24	1.29	3.22
		2024-25	1.28	1.5
		2025-26	1.39	4.67
		2026 (till June26)	1.18	2.55
		Total	13.58	38.77

For usage statistics of MTL facility please refer Annexure V

Optical Profilometry Facility (OPF)

OPF FACILITY

CONVENER:

PROF. KANTESH BALANI (MSE)

Internal Revenue (LDA): 4.11 Lakhs

External Revenue (Testing A/c): 2.25 Lakhs

Rs. 0.74 Lakhs

**Total contribution towards DoRD
establishment from OPF as overhead**

ACMS LDA and Testing Account Revenue				
Lab Name	Faculty Convener	Year	Revenue generated from IITK Users (LDA)	Revenue generated from Non-IIT K Users (Testing Account)
			In Rs. Lakhs	In Rs. Lakhs (after tax. deduction)
Optical Profilometer Facility (OPF)	Dr. Kantesh Balani	2015	0.05	0.04
		2016	0.11	0.10
		2017	0.10	0.14
		2018	0.23	0.14
		2019	0.05	0.17
		2020	0.15	0.04
		2021	0.68	0.16
		2022	0.77	0.10
		2023	0.63	0.40
		2024	0.57	0.35
		2025	0.49	0.48
		2026 (till June26)	0.28	0.14
		Total	4.11	2.25

For usage statistics of OPF facility please refer **Annexure VI**

Indentation Lab (IL)

IL FACILITY

CONVENER:

PROF. KATESH BALANI (MSE)

Internal Revenue (LDA): 8.47 Lakhs

External Revenue (Testing A/c): 6.34 Lakhs

Rs. 2.09 Lakhs

**Total contribution towards DoRD
establishment from IL as overhead**

ACMS LDA and Testing Account Revenue				
Lab Name	Faculty Convener	Year	Revenue generated from IITK Users (LDA)	Revenue generated from Non-IIT K Users (Testing Account)
			<i>In Rs. Lakhs</i>	<i>In Rs. Lakhs (after tax. deduction)</i>
Indentation Lab (IL)	Dr. Kantesh Balani	2014	0.34	0.00
		2015	1.28	0.43
		2016	0.30	0.71
		2017	0.24	0.28
		2018	0.43	1.77
		2019	0.44	0.62
		2020	0.31	0.24
		2021	1.22	0.61
		2022	0.73	0.24
		2023	0.94	0.72
		2024	1.36	0.04
		2025	0.58	0.12
		2026 (till June26)	0.31	0.56
		Total	8.47	6.34

For usage statistics of IL facility please refer Annexure VII

Thermal Processing Lab (TPL)

TPL FACILITY PROFILE

CONVENER:

PROF. ANISH UPADHYAYA (MSE)

Internal Revenue (LDA): 9.14 Lakhs

External Revenue (Testing A/c): 9.40 Lakhs

Rs. 3.10 Lakhs

**Total contribution towards DoRD
establishment from TPL as overhead**

ACMS LDA and Testing Account Revenue				
Lab Name	Faculty Convener	Year	Revenue generated from IITK Users (LDA)	Revenue generated from Non-IIT K Users (Testing Account)
			In Rs. Lakhs	In Rs. Lakhs (after tax. deduction)
Thermal Processing Lab (TPL)	Dr. Anish Upadhyaya	2014	0.34	0.64
		2015	0.42	0.55
		2016	0.53	0.54
		2017	0.35	0.41
		2018	0.52	0.82
		2019	0.34	0.42
		2020	0.47	0.97
		2021	0.61	0.71
		2022	1.02	0.71
		2023	1.19	0.77
		2024	1.42	0.91
		2025	1.35	1.24
		2026 (till June26)	0.58	0.71
		Total	9.14	9.40

For usage statistics of TPL facility please refer **Annexure VIII**

Magnetics Lab (ML)

ML FACILITY

CONVENER:

PROF. SATYAJEET BANERJEE (PHY)

Internal Revenue (LDA): 2.91 Lakhs

External Revenue (Testing A/c): 9.46 Lakhs

Rs. 3.12 Lakhs

**Total contribution towards DoRD
establishment from ML as overhead**

ACMS LDA and Testing Account Revenue				
Lab Name	Faculty Convener	Year	Revenue generated from IITK Users (LDA)	Revenue generated from Non-IIT K Users (Testing Account)
			In Rs. Lakhs	In Rs. Lakhs (after tax. deduction)
Magnetics Lab (ML)	Dr. Satyajeet Banerjee	2016	0.17	0.22
		2017	0.07	0.78
		2018	0.24	0.48
		2019	0.27	1.33
		2020	0.18	0.55
		2021	0.32	0.65
		2022	0.46	0.69
		2023	0.29	1.33
		2024	0.38	1.11
		2025	0.35	1.78
		2026 (till June26)	0.20	0.56
		Total	2.91	9.46

For usage statistics of ML facility please refer **Annexure IX**

A Snapshot of major contribution to DoRD from selected ACMS Labs

XPS LAB (XPS)

Rs. 36.5 L

ELECTRON MICROSCOPY
LAB (EML)

Rs. 11.4 L

MECHANICAL TESTING LAB
(MTL)

Rs. 12.8 L

X-RAY DIFFRACTION LAB
(XRD)

Rs. 3.9 L

THERMAL PROCESSING
LAB (TPL)

Rs. 3.1 L

INDENTATION LAB (IL) &
OPTICAL PROFIOMETRY
FACILITY (OPF)

Rs. 2.8 L

MAGNETICS LAB (ML)

Rs. 3.1 L

CONSOLIDATED AMOUNT FROM
REST OF THE LABS UNDER
ACMS

Rs. 1.4 L

The above-mentioned amounts is the overhead share - drawn from the Testing Account of ACMS Facilities - contributed to DoRD Establishment from the External (Non-IITK) User Fee.

Annexures: Usage Statistics of ACMS Facilities

Usage Statistics for individual facilities at ACMS can be accessed by going through the Annexures that are accessible in the link:

https://drive.google.com/drive/folders/1oBU-vI6mxOpjozYtcSW-BvojIauZY_9I?usp=sharing

Annexure I: ACMS Facility Usage Revenue Datasheet (all labs)

Annexure II: Usage Statistics Electron Microscopy Lab (EML)

Annexure III: Usage Statistics XPS Facility (XPS)

Annexure IV: User Statistics X-Ray Diffraction Facility (XRD)

Annexure V: Usage Statistics Mechanical Testing Lab (MTL)

Annexure VI: Usage Statistics Optical Profilometry Facility (OPF)

Annexure VII: Usage Statistics Indentation Lab (IL)

Annexure VIII: Usage Statistics Thermal Processing Lab (TPL)

Annexure IX: Usage Statistics Magnetism Lab (ML) Facility

Annexure X: Usage Statistics Electrical Characterization Lab (ECL)

Annexure XI: Usage Statistics Live Cell Imaging (LCI), Sample Preparation Lab (SPL); XRF-IRMS Facility

Acknowledgement

- On behalf of my ACMS family (*Facility Faculty and Staff In-charges & all ACMS staff members*), I thank DoRD Team for all their assistance and helping us in ensuring that all LDA and Testing Accounts of various ACMS facilities are maintained up-to-date. I wish to specifically acknowledge the assistance of following DoRD personnel:

Md. Saifulabad Siddiqui (*Jr. Supdt.*),
Mr. Vinay Shukla (*Proj. Mgr*),
Ms. Mansi Yadav (*Asst. Proj. Mgr*),

Mohd. Shamshuddin (*Jr. Assistant*),
Ms. Veena Tiwari (*Dy. Proj. Mgr*),
Mr. Vijay Bahadur (*Asst. Proj. Mgr*)

- The help provided by Shri M. Siva Kumar (*STS-SG*), and Mr. Anoop Raut (*TS*) from ACMS in collating and compiling data in in presentable format is gratefully acknowledged.
- On behalf of all my colleagues (*Faculty In-Charges of ACMS facilities*) and my own personal behalf, I place on record my sincere appreciation to all ACMS staff members for their dedicated efforts in maintaining and updating records. The team includes:

Mr. M. Siva Kumar, Mr. D.D Pal, Mr. Jai Kishan, Mr. Kamlesh Thapliyal, Mr. Anoop Raut, Mr. Ashish Tiwari, Mr. Pankaj Kumar, Mr. Ravindra Agnihotri, Mr. Prashant Shukla, Mr. Pushpendra Kumar, Mr. Rupesh Kumar Sharma, Mr. Mitesh Shrotriya, Mr. Ashutosh Yadav, Mr. Uttam Pramanik, Mr. Parikshit Yadav, Mr. Puneet Kumar, Mr. Harshit Agrawal, Mr. Abhishek Kumar; Mr. Aniket Dwivedi, and Mr. Jatin Rawat

Dr. Anish Upadhyaya

For Any Queries, Please Contact:

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Advanced Centre for Materials Science Indian Institute of Technology Kanpur

Annexure I

ACMS Facility Usage Revenue Datasheet (all labs)

Overall Financial Summary

External Testing

₹ 226.2 Lakhs

44.3% of total



IITK Users (LDA)

₹ 285.4 Lakhs

55.7% of total

Revenue Generated from ACMS LDA and Testing Account

	Lab Name	Revenue from IITK Users (LDA)	Revenue from Non-IIT K Users (Testing Account)	Contributed to R&D
		[in Rs. Lakhs]	[in Rs. Lakhs]	[in Rs. Lakhs]
1	Electron Microscopy Lab (EML)	81.24	34.55	11.40
2	Surface Charact. Lab (XPS)	35.63	110.61	36.50
3	X-Ray Diffraction Lab (XRD)	29.67	11.90	3.93
4	Mechanical Testing Lab (MTL)	13.58	38.77	12.79
5	Optical Profilometry Lab (OPL)	4.11	2.25	0.74
6	Indentation Lab (IL)	8.47	6.34	2.09
7	Thermal Processing Lab (TPL)	9.14	9.40	3.10
8	Magnetics Lab (ML)	2.91	9.46	3.12
9	XRF-IRMS Lab (XRF)	59.96	7.41	0.00
10	Sample Prep Facility (SPL)	1.12	0.00	0.00
11	Live Cell Imaging (LCI)	35.77	0.00	0.00
12	Electrical Charact. Facility (ECF)	3.82	3.46	1.14
Grand Total of all labs		285.42	226.21	74.82

ACMS LDA and Testing Account Revenue

Lab Name	Faculty Convener	Year	Revenue generated from IITK Users (LDA)	Revenue generated from Non-IIT K Users (Testing Account)	LDA No.	Testing Acc. No.	
			In ₹ Lakhs	In ₹ Lakhs (after tax. deduction)			
Electron Microscopy Lab (EML)	Dr. Shashank Shekhar & Dr. Kaustubh Kulkarni	2014	1.10	0.74	2014242 2014243	(T-14-018)	
		2015	4.36	1.50		(T15-09)	
		2016	5.77	3.55		(T16-01)	
		2017	2.94	7.66		(T17-010)	
		2018	9.76	2.55		(T18-03)	
		2019	11.66	2.88	2019351 2019352	(T19-03)	
		2020	2.40	7.88		(T20-03)	
		2021	10.08	1.68		(T21-03)	
		2022	3.81	1.58		(T22-03)	
		2023	6.83	0.20		(T23-013)	
		2024	13.44	2.37	2024414 2024413	(T24-03)	
		2025	5.97	0.20		(T25-03)	
		2026 (till June26)	3.14	1.77		(T26-03)	
			Total	81.24	34.55		
		Surface Characterizatin facility (XPS)	Dr. Gouthama	2014	0.88	0.64	2014244
2015	2.46			2.89			
2016	1.51			12.21			
2017	2.78			17.72			
2018	5.28			23.31			
2019	4.25			18.00			
Dr. Gopakumar	2020		3.37	7.07	2019426		
	2021		2.29	11.55			
	2022		1.64	6.77			
	2023		5.47	6.44			
	2024		5.71	4.01	2025415		
2025-26	0	0					
	Total	35.63	110.61				
		2015	2.62	0.98		T15-05	

X-Ray Diffraction Lab (XRD)	Dr. Nilesh Prakash Gurao	2016	2.36	1.00	2014219	T16-05
		2017	1.68	1.03		T17-05
		2018	5.02	2.08		T18-05
		2019	6.17	1.61	2019318	T19-05
		2020	1.99	0.63		T20-05
		2021	1.97	0.47		T21-05
		2022	1.98	0.72		T22-05
		2023	1.71	1.30		T23-05
		2024	2.07	0.99	2024343	T24-05
		2025	1.71	0.65		T25-05
		2026 (till June26)	0.39	0.45		T26-05
		Total	29.67	11.90		
Mechanical Testing Lab (MTL)	Dr. Shashank Shekhar	2015-16	0.68	0.08	20130314	T15-061
		2016-17	0.50	0.32		T16-061
		2017-18	0.97	2.78		T17-061
		2018-19	0.92	3.96		T18-061
		2019-20	1.06	4.12	2019113	T19-061
	Dr. Sudhanshu Shekhar Singh	2020-21	0.72	4.92		T20-061
		2021-22	1.94	6.00		T21-061
		2022-23	1.65	4.65		T22-061
		2023-24	1.29	3.22		T23-061
		2024-25	1.28	1.50	2024192	T24-061
		2025-26	1.39	4.67		T25-061
		2026 (till June26)	1.18	2.55		T26-061
		Total	13.58	38.77		
Optical Profilometer Facility (OPF)	Dr. Kantesh Balani	2015	0.05	0.04	20130305	T15-11
		2016	0.11	0.10		T16-02
		2017	0.10	0.14		T17-03
		2018	0.23	0.14		T18-04
		2019	0.05	0.17		T19-04
		2020	0.15	0.04	2018463	T20-04
		2021	0.68	0.16		T21-04
		2022	0.77	0.10		T22-04
		2023	0.63	0.40		T23-04
		2024	0.57	0.35	2023696	T24-17
		2025	0.49	0.48	2025006	T25-83
		2026 (till June26)	0.28	0.14		T26-83

		Total	4.11	2.25		
Indentation Lab (IL)	Dr. Kantesh Balani	2014	0.34	0.00	2013035	
		2015	1.28	0.43		T15-11
		2016	0.30	0.71		
		2017	0.24	0.28		T17-03
		2018	0.43	1.77		T18-04
		2019	0.44	0.62	2018463	T19-04
		2020	0.31	0.24		T19-04
		2021	1.22	0.61		T20-04
		2022	0.73	0.24		T22-04
		2023	0.94	0.72		T23-04
		2024	1.36	0.04	2023696	T23-04
		2025	0.58	0.12		T25-17
		2026 (till June26)	0.31	0.56		T26-17
		Total	8.47	6.34		
Thermal Processing Lab (TPL)	Dr. Anish Upadhyaya	2014	0.34	0.64	2016094	
		2015	0.42	0.55		
		2016	0.53	0.54	2014088	
		2017	0.35	0.41		
		2018	0.52	0.82	2019191	
		2019	0.34	0.42		
		2020	0.47	0.97		
		2021	0.61	0.71		
		2022	1.02	0.71		
		2023	1.19	0.77	2021337	
		2024	1.42	0.91		T24-17
		2025	1.35	1.24		T25-17
		2026 (till June26)	0.58	0.71		T26-17
		Total	9.14	9.40		
Magentics Lab (ML)	Dr. Satyajeet Banerjee	2016	0.17	0.22		
		2017	0.07	0.78		
		2018	0.24	0.48		
		2019	0.27	1.33		
		2020	0.18	0.55		
		2021	0.32	0.65		
		2022	0.46	0.69		
		2023	0.29	1.33		

		2024	0.38	1.11	2024419	
		2025	0.35	1.78		
		2026 (till June26)	0.20	0.56		
		Total	2.91	9.46		
XRF & IRMS	Dr. Debajyoti Paul	2022	35.45		2021344 2021331	
		2023	3.34			
		2024	6.47			
		2025	14.46			
		2026 (till June26)	0.25			
		Total	59.96	7.41		
Sample preparation Lab (SPL)	Dr. Niraj M. Chawake	2005	0.45			
		2026 (till June26)	0.68			
		Total	1.12	0.00		
Live Cell Imaging (LCI)	Dr. Jonaki Sen	2014	14.24		2014108	
		2015	0.47			
		2016	1.02			
		2017	1.74			
		2018	1.70			
		2019	2.06		2019133	
		2020	0.90			
	Dr. Nitin Mohan	2021	1.70			
		2022	2.04			
		2023	2.81		2024390	
		2024	0.20			
		2025	2.55			
		2026 (till June26)	4.34			
		Total	36	0.00		
Electrical Characterization Facility (ECF)	Dr. Sarang Ingole (Convener for 4 probe from 2015-2025)	2015	0.051	0.000	2015060	
		2016	0.157	0.122		T16-16
		2017	0.204	0.060		T16-17
		2018	0.080	0.111		T16-18
		2019	0.158	0.048		T16-19
		2020	0.019	0.006	2020349	T16-20
		2021	0.660	0.071		T20-26
		2022	0.571	0.112		T20-26
		2023	0.307	0.148		T20-26
		2024	0.331	0.143		

	Total	2.538	0.821		
Dr. T Maiti (Convener for Thermo Electric from 2015-2025)	2015	0.010	0.000	2015199	
	2016	0.046	0.000		
	2017	0.050	0.000		
	2018	0.068	0.034		T16-18
	2019	0.090	0.000		T16-17
	2020	0.018	0.000	2020374	
	2021	0.021	0.000		
	2022	0.127	0.000		T20-14
	2023	0.063	0.000		
	2024	0.000	0.000		
	Total	0.491	0.034		
Dr. Shobit Omar (Convener for High Temp. Probostat from 2015-2025)	2015	0.000	0.000	2015190	
	2016	0.000	0.000		
	2017	0.000	0.000		
	2018	0.000	0.000		
	2019	0.014	0.030		T16-19
	2020	0.072	0.000	2020311	T16-19
	2021	0.080	0.292		T16-19
	2022	0.065	0.136		T20-25
	2023	0.074	0.274		T20-25
	2024	0.000	0.429		T20-25
	Total	0.305	1.161		
Dr. Shobit Omar (Sole Convener, ECF since 2026)	2025	0.305	0.455	2025639	T20-25
	2026*	0.199	0.454	2025639	T20-25
	Total	0.504	0.909		
	Grand Total (ECF)	3.84	2.92		

Grand Total of All Labs **285.43** **226.21**

Revenue from Testing
Account

Revenue from IITK Users
LDA (Non-IIT K Users) after
deducting GST

ACMS Labs	LDA Revenue	TESTING-A/c Revenue	Shared with DoRD towards DoRD Establishment
Major Contributors	<i>In Rs. Lakhs</i>	<i>In Rs. Lakhs</i>	<i>In Rs. Lakhs</i>
EML	81.24	34.55	11.40
XPS	35.63	110.61	36.50
XRD	29.67	11.90	3.93
MTL	13.58	38.77	12.79
TPL	9.14	9.40	3.10
Other Labs*	116.18	20.97	6.92
Total	285.43	226.21	75.00

* **Other Labs** include: OPF, IL, ML, XRF-IRMS, LCI, ECF, SPL

Annexure II



Advanced Centre for Materials Science Indian Institute of Technology Kanpur

Usage Statistics and Fiscal Status Report

Electron Microscopy facility (EML, Room- 112, ACMS)

Prof. Anish Upadhyaya

(Head, ACMS)

Prof. Shashank Shekhar

(Faculty In-charge, SEM Facility)

Prof. Kaustubh Kulkarni

(Faculty In-charge, EPMA Facility)

Lab Staff:

Mr. M Siva Kumar

(Senior Technical Superintendent)

Mr. Uttam Kumar Pramnik

(Junior Technician)

Mr. Parikshit Yadav

(Junior Technician)

Rejuvenation of Electron Microscopy Lab-2014

Equipment's procure during 20214.

❑ Tungsten scanning Electron Microscope (W-SEM)

- Model JSM-6010LA along with EDS and BSE Attachment
- Make: JEOL, PO No Import/NC-2437 dated 31/03/2013
- **Price: Rs.60,00,000**

❑ Field Emission scanning Electron Microscope (FE-SEM)

- Model JSM-7100F along with Oxford EDS ,EBSD and Gatan *In-situ* Stage Attachment
- Make: JEOL, PO No Import/NC-2446 dated 31/03/2013
- **Price: Rs.2,32,35,000**

❑ Electron Probe Micro Analyzer (EPMA)

- Model JXA-8230 along with EDS and 4 Channel, equipped with 8 Crystal
- Make: JEOL, PO No Import/NC-2435 dated 31/03/2013
- **Price: Rs.3,90,00,000**

Summary Outlines of ACMS EML (EML)

- Total **4 different dedicated equipment's** (W-SEM, FESEM ,EPMA and Optical Microscope) along with their accessories (**Gold Coater, Carbon Coater and Plasma Cleaner**) are installed in the Electron Microscopy Lab (EML) at ACMS.
- FESEM has equipped with the accessories of EBSD (OIM) and *In-situ* Heating Stage (EBSD)
- EPMA has equipped with 4 channel (8 Crystal) ,collaboration with prof Sumit, USA procured 34 Geological standard
- Over **70,594 Samples** have been tested so far between 2014 to 2026 at EML.
- Total **45,686 Hours** of equipment usage time utilized in sample analysis.
- **18% of users** are **Non IITK** (including National and Regional Academic Institutions ; R&D Organisation; and Industries).
- Faculty, Research Scholars and Students from **14 Departments and Centers at IIT Kanpur** have utilized EML facilities since their installation in 2014.
- A total revenue of around **Rs 82.11 Lakh** from **IIT Users** and **Rs. 34.55 Lakh** from **Non IITK Users** till date. EML has also contributed **Rs. 11 Lakhs** to **R&D** from the testing amount collected from Non IITKUsers.
- The facility has operated in **self-sustained mode** and met ~**60%** of its expenditures through LDA and balance **40%** from ACMS Budget. After taking into consideration, expenditures incurred for upgradation, maintainence and repairs, EML (SEM and EPMA)**LDA has still has balance of Rs 28 Lakhs** as on June 2026

Major Facilities *under* ACMS Electron Microscopy Lab (EML)

	Instrument Name	Manufacturer	Model	Additional Setup	Standard Testing	Year of Installation
1	Electron Probe Micro Analyzer	JEOL	JXA 8230	4 channel (8 Crystals)	Compositional Analysis, WDS	2014
2	Tungsten Electron Microscope	JEOL	JSM 6010 LA	EDS	Imaging and EDS	2014
3	Field Emission Scanning Electron Microscope	JEOL	JSM 7100F	EDS, EBSD, In-Situ	Imaging, Compositional Analysis	2014
4	Plasma Cleaner	JEOL	EC-52000IC			2014
5	Gold Sputter Coating	JEOL	JEC 3000		Gold coating	2014
6	Carbon Sputter Coating	JEOL	JEC 560		Carbon coating	2014
7	Optical Microscope	CARL ZEISS	GmbH	DIC	Imaging	2014

N.B.: No instrument procured after 2014.

Specifications of Instruments housed-in Electron microscopy Lab

Tungsten Scanning Electron Microscope (WSEM)



- ❑ Manufactured by JEOL
- ❑ BSE Resolution: 5nm at 20kV
- ❑ Magnification: 5x to 300000x
- ❑ Accelerating voltage: 0.5 to 20kV
- ❑ Automatic SEM condition set-up

Field Emission Scanning Electron Microscope (FESEM)



- ❑ Manufactured by JEOL
- ❑ SE Resolution: 3nm at 15kV/5nA
- ❑ Magnification: 10x to 1000000x
- ❑ Accelerating Voltage: 0.5 to 30kV
- ❑ Elemental mapping, Micro-texture analysis,
- ❑ GATAN Tensile stage of 5kN capacity and temperature of 500 degree Celsius

Electron Probe Micro Analyzer (EPMA)



- ❑ Manufactured by JEOL
- ❑ SE Image Resolution: 5nm
- ❑ Probe current stability: +/-0.05%/h
- ❑ Accelerating voltage: 0.2 to 30kV
- ❑ Probe current: 10⁻¹² to 10⁻⁵ nA
- ❑ WDS wavelength detection: 0.087 to 9.3nm
- ❑ Four channels ensure fast analysis for Multicomponent alloy and Minerals.

to be contd..

Optical microscope



- ❑ Manufactured by CARL ZEISS
- ❑ Optical Microscope with Differential Interference Contrast (DIC) Imaging Capability

Plasma Cleaner



- ❑ Manufactured by JEOL
- ❑ A plasma cleaner uses a low-pressure gas and high voltage to create a plasma. This energized gas interacts with the surface of a material, removing contaminants like hydrocarbons. This improves the quality of images in electron microscopy and prepares surfaces for other processes.

Gold Sputter Coating



- ❑ Manufactured by JEOL
- Gold sputter coating is a technique used to deposit a thin layer of gold onto the surface of a material. It is commonly used to prepare samples for scanning electron microscopy (SEM) and other analytical techniques

Carbon Sputter Coating



- ❑ Manufactured by JEOL
- ❑ A carbon coater is a device used to deposit a thin layer of carbon onto the surface of a material. It is commonly used to prepare samples for scanning electron microscopy (SEM) and other analytical techniques.

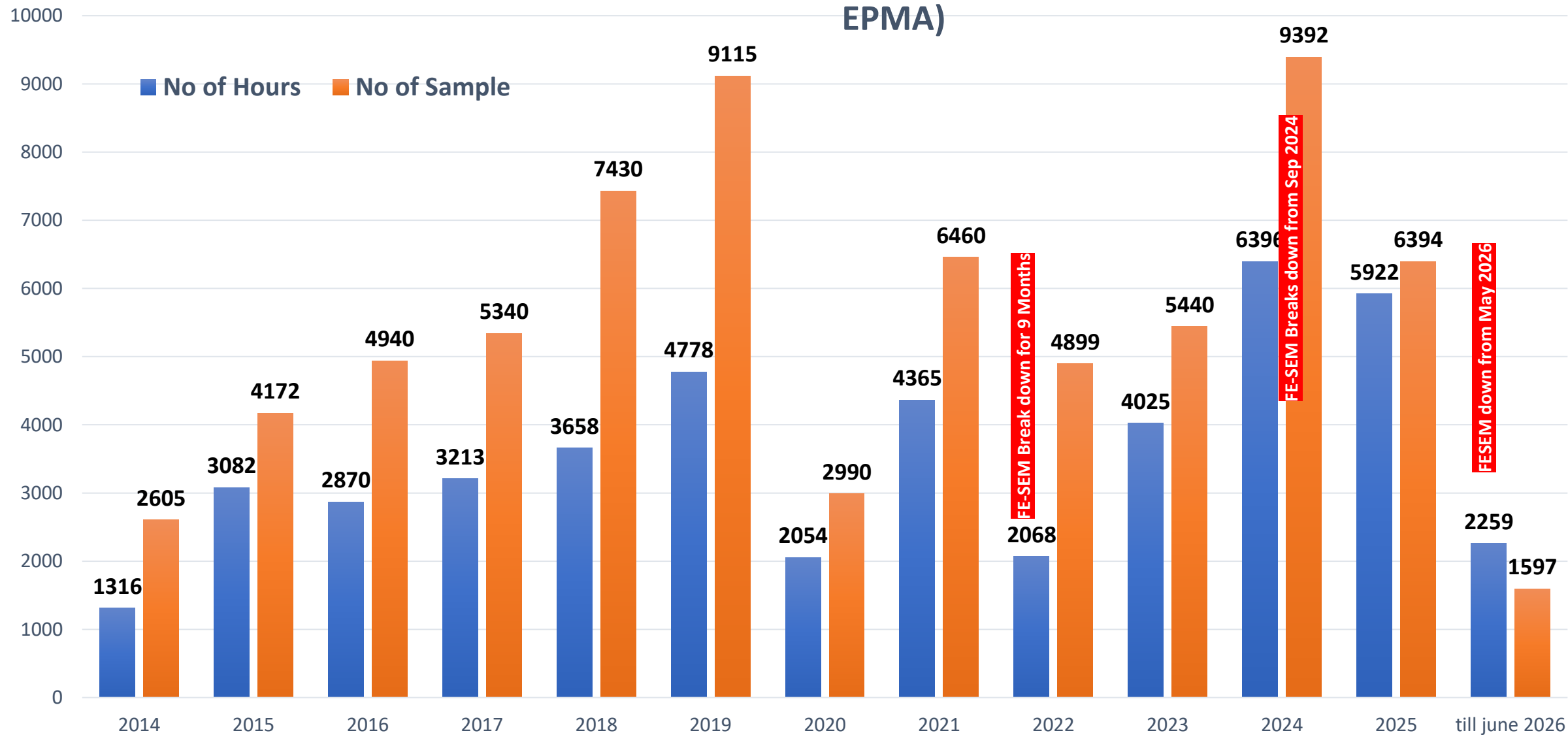
Yearly Summary Table of Number of Samples Tested by Each Instrument						
Number of Samples Vs Number of Hours Tested by Specific Instrument						
Year	WSEM-no of hours	WSEM-No of Sample	FESEM-No of hours	FESEM-No of Sample	EPMA-no of hours	EPMA-No of Sample
2014	569	1420	524	1310	203	30
2015	830	2075	1386	3465	623	75
2016	595	1485	1351	3375	527	80
2017	743	1855	1359	3395	420	90
2018	790	1975	2134	5335	574	120
2019	1230	3075	2377	5940	615	100
2020	423	1055	1127	2820	313	50
2021	806	2015	1747	4370	493	75
2022	923	2305	300	600	824	110
2023	658	1645	1484	3710	810	85
2024	1268	3170	3015	5840	1387	382
2025	1586	2857	3380	3170	956	367
Till June 2026	968	596	767	689	524	312
TOTAL	11389	25528	20951	44019	8269	1876

Grand Total No sample and no of Hours Utilized since June 2014 to till June 2026

Total No of Hours- 45,686

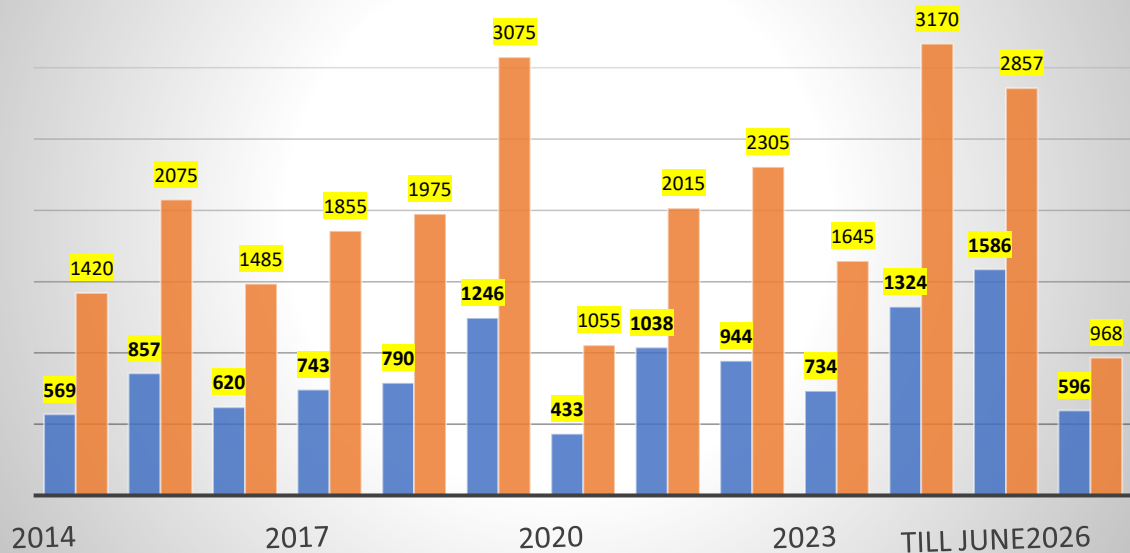
Total No of Samples- 70,594

Total numbers of Samples Vs Hours Utilized in EM Lab facility(W-SEM,FESEM and EPMA)

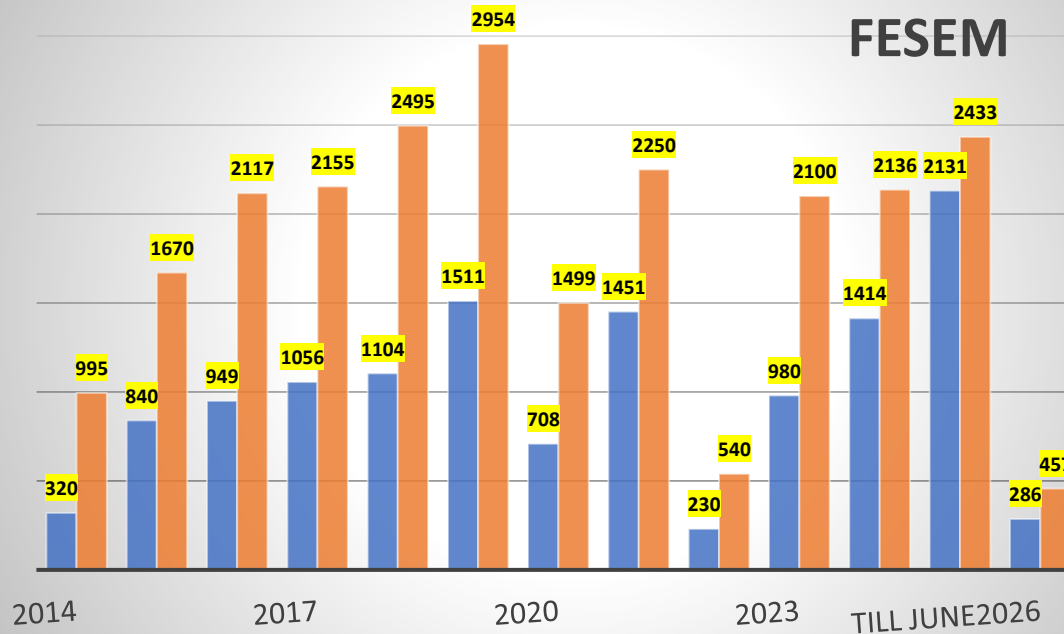


Year-to-Year Usage of Instruments vis a vis Number of Samples Vs Utilization hours

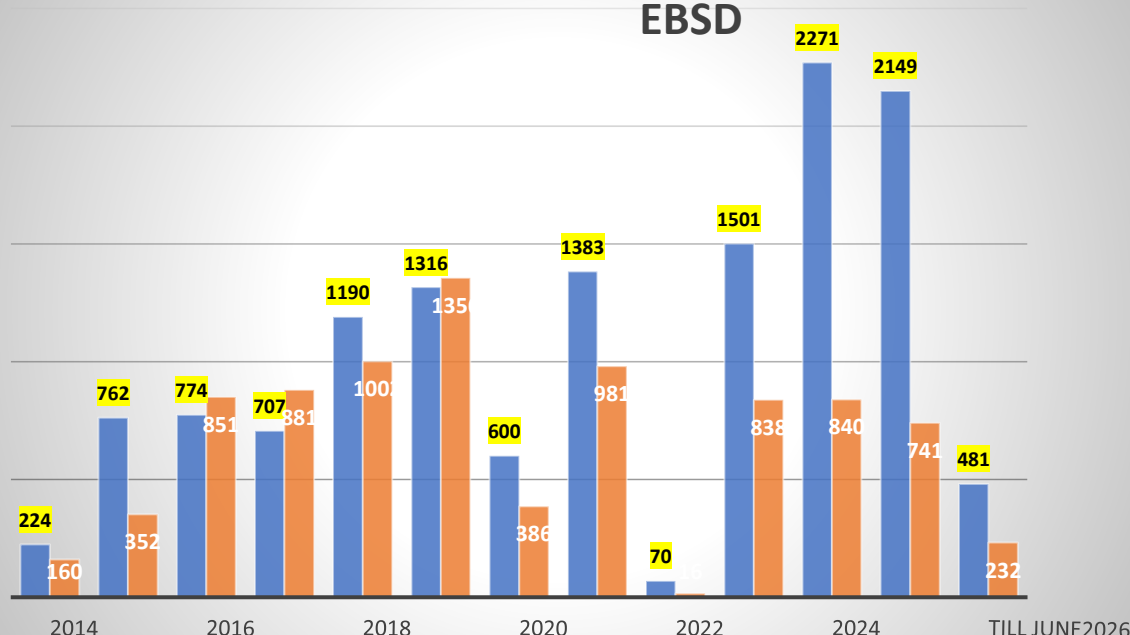
W-SEM



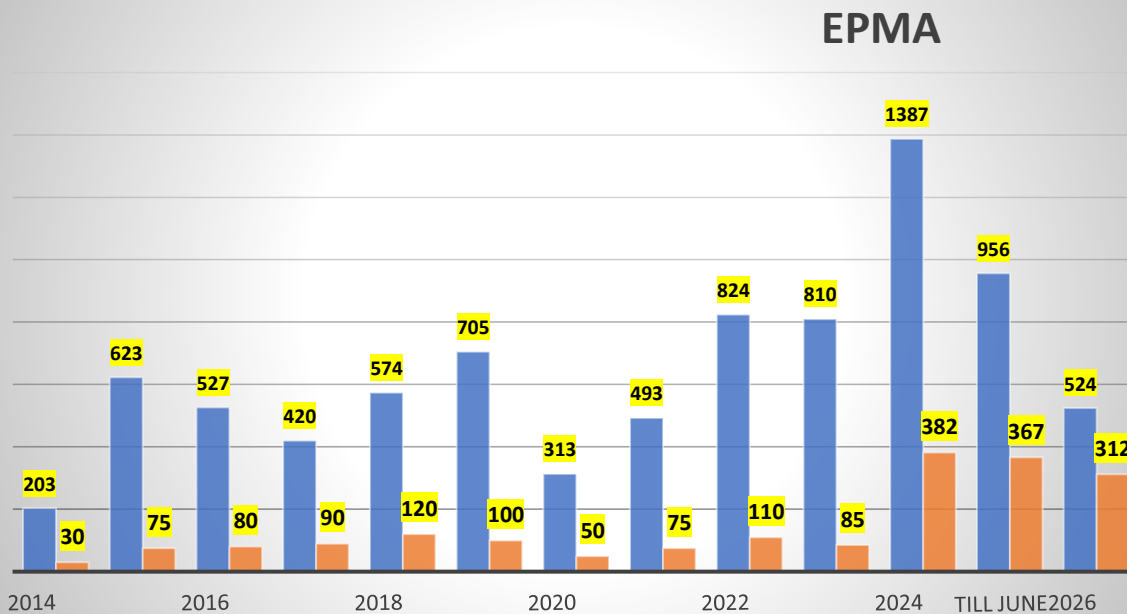
FESEM



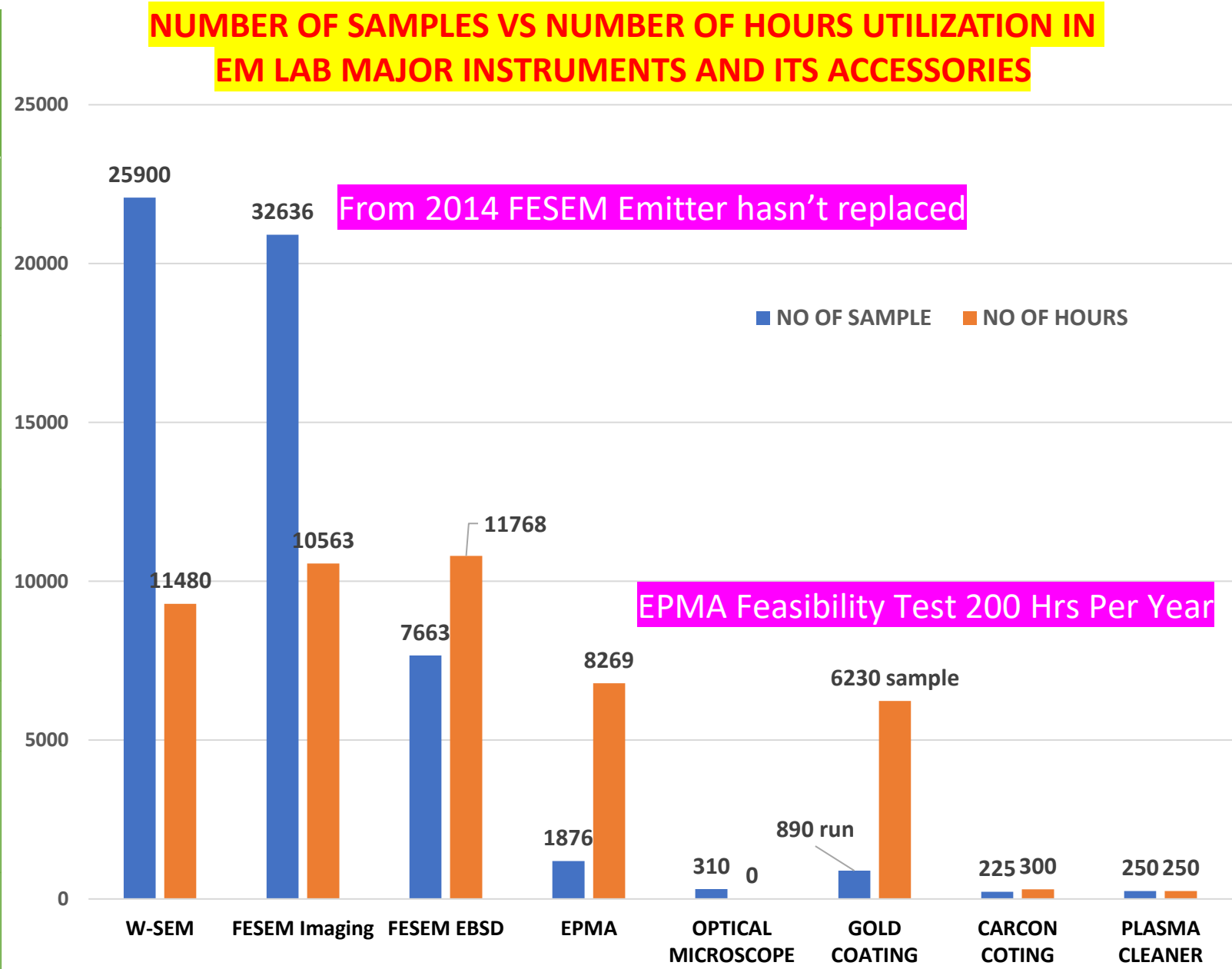
EBS



EPMA



INSTRUMENTS	NO OF HOURS	NO OF SAMPLE
W-SEM	11480	25900
FE-SEM-Imaging	10563	32636
FE-SEM-OIM (EBSD)	11768	7663
EPMA	8269	1876
OPTICAL MICROSCOPE	310	310
GOLD COATING	890 Run	6230
CARBON COATING	225Run	300
PLASMA CLEANER	250	250
GRAND TOTAL	70594	45686

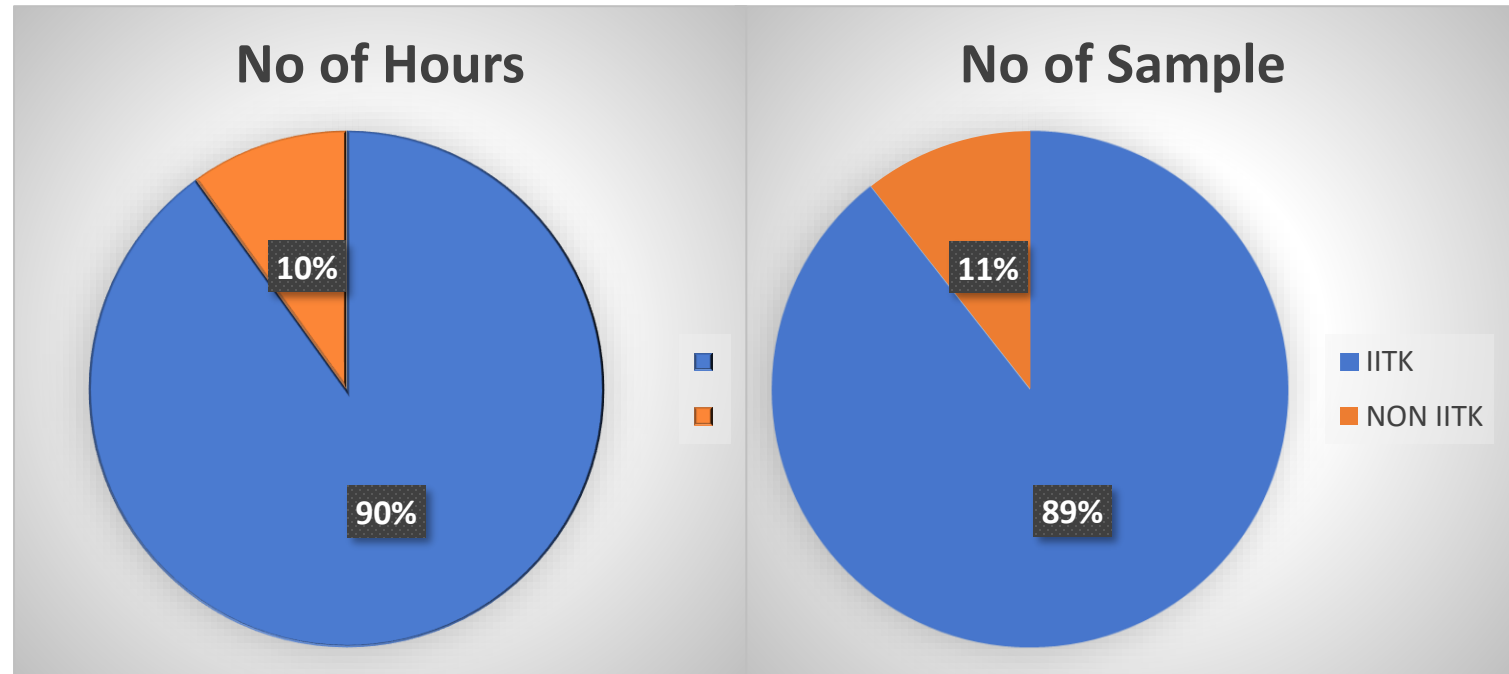


Usage Statistics of EML Instruments by IITK (Internal) and Non-IITK (External) Users

Years	No of Sample		No of Hours	
	IITK	Non- IITK	IITK	Non- IITK
2014	2465	140	1264	52
2015	4012	160	2946	136
2016	4186	754	2444	423
2017	4530	810	2579	377
2018	6710	720	3308	350
2019	7772	1343	3832	946
2020	2469	341	1846	208
2021	5865	595	3931	434
2022	4491	408	1720	348
2023	4810	630	3489	516
2024	8655	737	5825	531
2025	6036	358	5662	260
Till June 2026	1555	42	2207	52
Total	63556	7038	41053	4633
Grand Total	70,594		45,686	

Total Number of Samples Tested: 70,594

Total Usage Time: 45,686 hrs

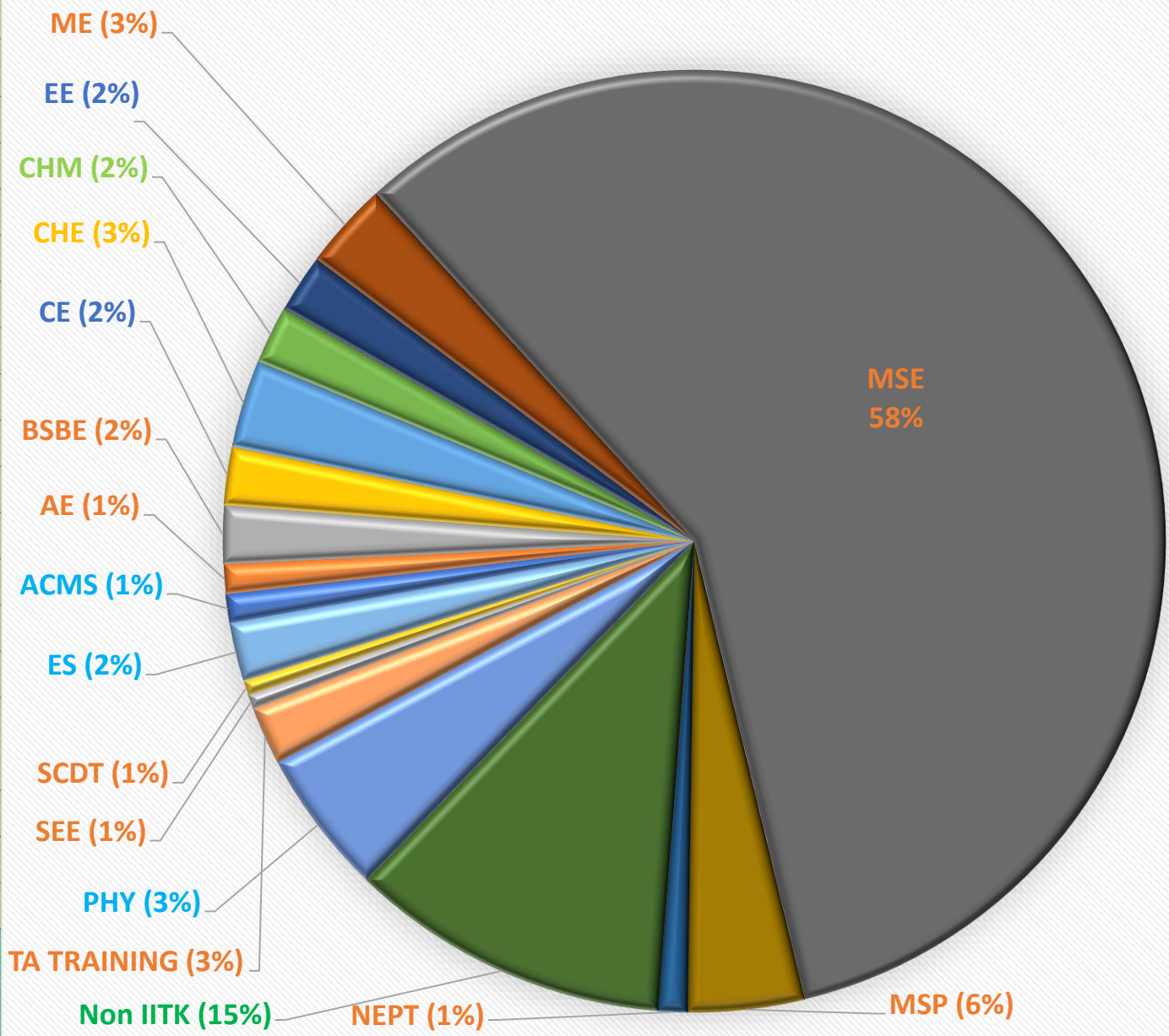


- In EPMA and EBSD analysis Feasibility analysis time more than 500 Hrs. per year

Usage Statistics of EML Instruments Within IITK by various Departments and Centers

DEPARTMENT WISE 2014 TO 2026

Department	No of Hours
ACMS	375
AE	378
BSBE	750
CE	750
CHE	1125
CHM	750
EE	750
ME	1125
MSE	21753
MSP	1500
NETP	375
Non IITK	4125
PHY	1875
TA-Training	750
SEE	187
SCDT	187
ES	750
Grand Total	45686



Testing Charges for Facilities in Electron Microscopy Lab at ACMS

Instrument		Rates for IITK Users	Rates for External Users (for Academia) (for Industry)	
1	WSEM	Rs 400 / Slot(2 hrs)	Rs 1000 / Slot(2 hrs)	Rs 4000 / Slot(2 hrs)
2	FE SEM	Rs. 650 / Slot(2 hrs)	Rs. 2000 /Slot(2 hrs)	Rs. 5000 /Slot(2 hrs)
3	EPMA	Rs. 1000 / Slot(3 hrs)	Rs. 5000 / Slot(3 hrs)	Rs. 10000 / Slot(3 hrs)
4	Gold Coating	Rs 400 Per Run	Rs. 1000 Per Run	Rs 2000 Per Run
5	Carbon Coating	Rs 400 Per Run	Rs. 1000 Per Run	Rs 2000 Per Run
6	Plasma cleaner	Rs 400 Per Run	Rs. 1000 Per Run	Rs 2000 Per Run
7	Optical Microscope			

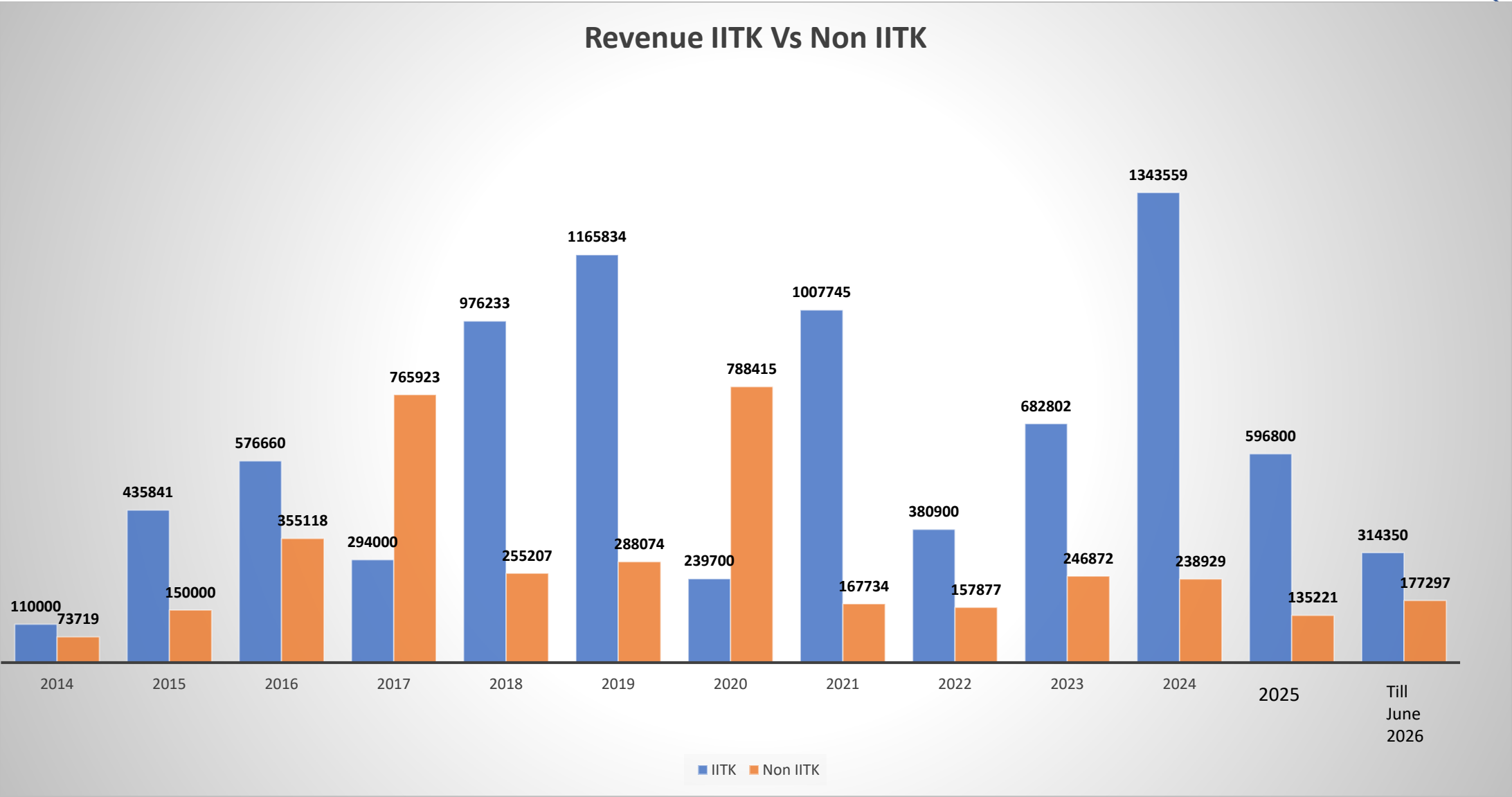
Revenue Generated from IITK (Internal) and Non-IITK (External) Users

LDA Revenue from 2014-2024			Non IITK Revenue		EPMA + SEM+ Non IITK Revenue
Year	EPMA Facility LDA	SEM Facility LDA	LDA	R&D	Total
2014	50000	60000	24573	24573	134573
2015	139391	296450	50000	50000	485841
2016	254000	322660	300059	30059	876719
2017	48000	246000	512416	213507	806416
2018	270505	703710	162499	67708	1136714
2019	446839	718995	182170	75904	1348004
2020	53000	186700	507117	211298	746817
2021	68000	939745	104283	43451	1112028
2022	222000	158900	97325	40552	478225
2023	332152	350650	96436	96436	779238
2024	685499	658060	92465	92464	1436024
2025	258400	338400	0	0*(2025 to 2026 disbursement not a done	596800
till june 2026	52750	261600	0	0	314350
Total	2880536	5241870	2129343	945952	9958702

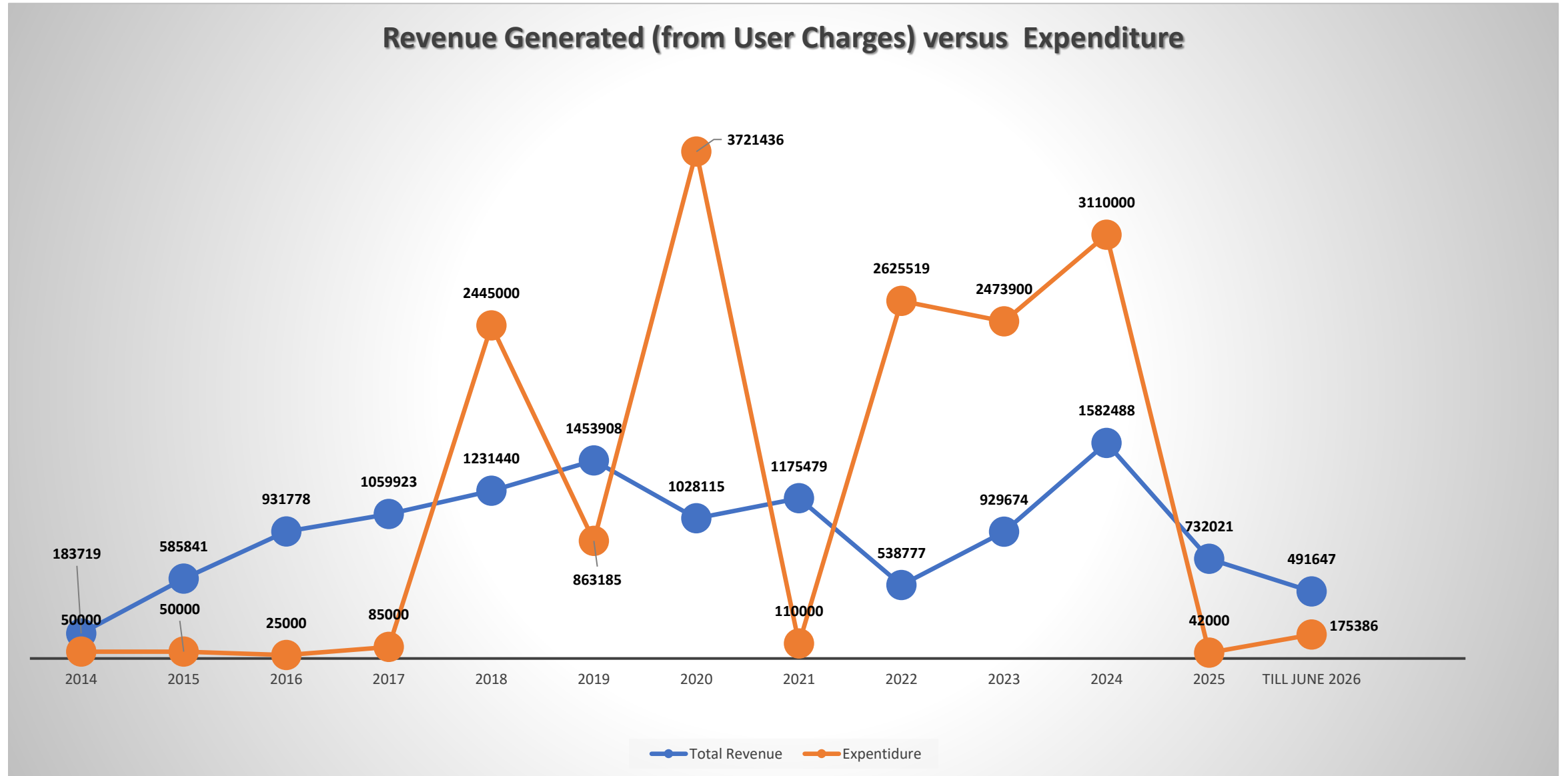
Since 2014 a total revenue of around Rs. 99.9 Lakhs towards Lab Development Account (LDA) has been generated. Around Rs. 11.4 Lakh is shared with R&D from the testing fee collected from Non IIT-K Users.

Revenue Generated from IITK (Internal) and Non-IITK Users

Amount raised for LDA (in Rs. Lakh)



Revenue Generated (from User Charges) versus Expenditure (in Maintenance and Repair)



EML EXPENDITURE SINCE 2014 TO 2024				
YEAR	SEM-LDA	EPMA LDA	ACMS Budget	Institute Special Grant
2014	Nil	Nil	Furniture and Lab Consumable items Rs.88000	Nil
2015	consumable items Rs18000	Nil	Consumable items Rs.25000	Nil
2016	consumable items Rs 20000	Rs.12000		Nil
2017	consumable items Rs 29000	Rs.25000	Filament Rs150000	Nil
2018	AMC for FESEM and W-SEM period of 2 years and EBSD Camera Rs1300000	EPMA AMC for 2 years Rs.1100000	Filament Rs160000	Nil
2019	AMC for oxford EDS and EBSD and Battery replacement Rs200000	Battery replacement Rs.175000 EM Lab Counsumable and Spare parts Rs.700000	Filament and consumable Rs.300000	Nil

EML EXPENDITURE SINCE 2014 TO 2024

YEAR	SEM-LDA	EPMA LDA	ACMS Budget	Institute Special Grant
2020	AMC for 2 year and EBSD detector repair Rs.1600000	EPMA AMC for 2 year Rs.1300000	Filament Rs.210000	FESEM MPU Board and EBSD & EDS Module Rs.1569000
2021	Oxford AMC, C,Cu Tape Rs.350000	EPMA Consumable items Rs.60000	EPMA ,FESEM Consumable Rs.640000	Nil
2022	FESEM and W-SEM AMC for 2 year and UPS Rs.1200000	Nil	BEI Detector and EM Lab Consumable items Rs.800000	Nil
2023	Oxford EBSD and EDS AMC 2 years Rs.350000	Nil	Computer and consumable items Rs.300000	Nil
2024	Consumable items items Rs.25000	AMC for 1 years Rs.800000	Rs.300000	FESEM Vacuum Board and FESEM & EPMA Consumable items Rs.2000000
Total	Rs.50,92,000	Rs. 41,72,000	Rs. 30,23,000	Rs. 35,69,000

Budgetary summary for Electron Microscopy Lab –LDA

Instrument	Revenue	Expenditures through LDA
Total revenue generated from IIT User (FESEM and W-SEM Facility)	Rs. 46,41,870	Rs.50,92,000
Total revenue generated from IIT User (EPMA Facility)	Rs. 25,69,386	Rs. 41,72,000
Total revenue generated from Non IITK IITK User (FESEM,W-SEM and EPMA Facility)	Rs. 21,29,343	
Total revenue	Rs. 9340599	Rs. 9264000

In a Clubbed Purchasing Prof.Shashank Shekhar has contributed more than **Rs.7 Lakh** for consumable items purchasing and AMC purchasing from his project

In a Clubbed Purchasing Prof.Kaustubh Kulkarni has contributed more than **Rs.8 Lakh** for consumable items purchasing and AMC purchasing from his project

From Prof.Kaustubh Kulkarni GE Project RQT Map Software has procure , Installed in EPMA
The Software cost: **Rs 7 Lakh**

Prof.Gouthama has contributed more than **2 Lakhs** for consumable items purchasing through his PDA

Training and Other Activities in EML Facilities at ACMS

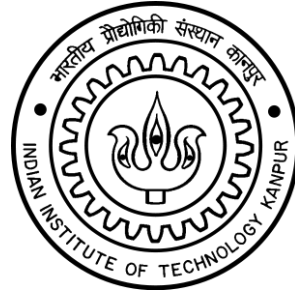
- ❑ EM Lab Organized Electron Microscopy Orientation program to Institute students 2014
- ❑ EML organized 2 QIP and 1 Teq-QIP short term courses/Workshops during Since 2014 to 2024
- ❑ NMD-ATM. ICME 2017 conference EML demonstrated In-situ Indentation workshop
- ❑ Most of the Institute conference EML conducted Microscopy Lab session

- ❑ We trained more than 80 students in WSEM from across various department from the Institute
(MSE, MSP,CHE,CHM,ME,CIVIL,ES,SEE AND PHYSICS)

- ❑ We trained more than 50 students in FESEM imaging facility and 30 students in FESEM *In-situ* EBSD Facility

Advanced Center For Materials Science

Indian Institute of Technology, Kanpur



Certificate of Appreciation

This certificate is presented to ***Mr. Mohit Mudgal*** (Roll No.:19109867) in appreciation to his contribution in managing and operating the Tungsten Electron Microscope (JEOL 6010LA) during the year (Jul-2022 to Dec-2022). He helped students to operate the equipment and analyze their samples.

(Dr. Shashank Shekhar)
Convener, EM Lab Facility

(Dr. Anish Upadhyaya)
Head of the Department

List of Students Trained in W-SEM and FESEM

Sandeep Sahu	Reshma	Navindar	Mirtanjay Kumar	Nikhil Tripathi
Biswajit Sengupta	Felgee	Rubia	Sarvesh swamy	Shruti
Ravi Prakash	Vivek sahu	K Hari	Thiyanesh	Neha
Aaditya	Sanjeev patel	Amarjeet	Jitesh Kumar	Pooja
Piyush Pramod	Rani Agarwal	Abhipsit Raturi	Neha Kumari	Dhananjay Kumar
Summet Mishra	Hariharan	Roopam Jain	Ravi Srivastava	Harish Ranout
Shirin Meshram	Ambreen	Surya Jaya	Shubhankar Pau	Navindar
Latimuni Patra	Price Setia	Anamitra Sikdar	Rita	Rituparna
Shirish Chandrakar	Shivam	Shushil Kumar	Arvind	Saket
Arvind Kannan				

List of Students Trained in W-SEM and FESEM

Sumit Mishra	Shruti Dubey	Shubham	Divya Rana	Gaurav Gupta
Mohamad Ashiq	Subha Sankeet Panda	Jitesh	Arif Ali	Anamitra
Sandeeo	Nitin	Vishnu Pradas	Chinmayee nayak	Sumit Guasin
Pradeep	Nikhil	Atasi Ghosh	Shipra Bajbai	Vishnu
Joshim Jamal	Parthadhwaj Konduparty	Sushil Kumar	K Vishwanath	Shubhanka
Diksha Srivastava	Harsha	Sourav	Shubha	Budhesh Bhaduria
Praveen Pandey	Shambavi Ray	Manish Ranjan	Ravi Tiwari	Jyoti
Ankur Srivastava	Aman Nigam	Aashan Ulla khan	Niti Rawat	Shivani

Key Non IITK Users of EML Facility at ACMS from Academia, R&D organizations and Industries

Academic Institutes

- MNNIT Allahabad
- DEI Dayalbagh
- MMMUT Gorakhpur
- MANIT Bhopal
- JSSATE
- HBTU
- NIT Jalandhar
- NIT Agartala
- IITDM Jabalpur
- IIT Patna
- IIITDM Jabalpur
- NIET Noida
- IIT-Delhi
- BIET Jhansi
- Axis College Kanpur
- Rewa Engineering College
- MPEC Kanpur
- NIT Rourkela
- NIT DURGAPUR
- IIT BHU
- Chennai University
- AKTU (CAS) Lucknow
- VNIT Nagpur
- SHUATS
- NIT-Durgapur
- NIET Greater Noida
- Maharana Pratap Kanpur
- Manipur University
- D Y Patil Institute
- CBIR
- BBAU
- Annamalai Chennai
- SPPGIDMS Lucknow
- Rama Dental College
- NIT Manipur
- NIT HAMIRPUR , HP
- NIT Bhopal
- Madras University
- IVRI Bareilly
- IIT Delhi
- Christ Church College
- IET Agra
- CSJMU
- CET, Trivandrum
- CAMBRIDGE INSTITUTE OF TECHNOLOGY, RANCHI
- Allen Institute
- **AND MANY MORE...**

Industries & R&D Organisations

- VSSC TIRUVANANTPURAM
- MKU
- DMSRDE
- ASI
- TATA STEEL
- WELSPUN
- STERLITE LTD
- GE INDIA
- MAGNUS
- SANDVIK INDIA
- Unimax International
- **AND MANY MORE...**

Annexure III



Advanced Centre for Materials Science Indian Institute of Technology Kanpur

Usage Statistics and Fiscal Status Report till Dec 2024
of

X-Ray Photo-electron Spectroscopy (XPS)
Facility @ ACMS (Room 110, ACMS)

Dr. Anish Upadhyaya
(Head, ACMS)

Dr. T.G. Gopakumar
(Faculty In-charge, XPS Lab)

Mr. Dev Datt Pal
(Sr. Tech. Supdt. SG, Staff In-charge)

Summary Outlines of ACMS X-ray Photoelectron Spectroscopy Lab (XPS Lab)

- XPS is equipped with AES and C60 sputter ion gun module to perform more than **5 types** of qualitative and quantitative analysis.
- Over **12,868 Samples** have been tested so far between 2014 to 2024 at XPS.
- Total **26,976 Hours** of equipment usage time utilized in conducting Test.
- **46% of total users** are **External** including IITs, NITs, CSIR, more than 50 Regional Academic Institutions.
- More than **100 Faculties**, from **24 Departments and Centers at IIT Kanpur** have utilized XPS facilities since their installation in 2014.
- A total revenue of around **Rs 1.4 Crore generated and 96.7 Lakhs contributed to LDA of XPS Lab** till date. XPS lab has also contributed **Rs. 36.5 Lakhs to R&D** from the testing amount collected from External Users.
- The facility has operated in **self-sustained mode** and met **~57%** of its expenditures through LDA and balance **43%** from ACMS Budget and Institute Special Grant.
- After taking into consideration, expenditures incurred for upgradation, maintenance and repairs, XPS Lab **LDA has still has balance of Rs 33 Lakhs as on 28.07.2025.**
- Since its inception, XPS Lab Facility at ACMS has sought only one special Grant/Funds from Institute of **Rs 19.3 Lakhs** in 2024-2025 fiscal year.

Instrument

Location: ACMS 110

Instrument: X-ray Photoelectron Spectroscopy(XPS) with Auger Electron Spectroscopy(AES) Module

Model/Supplier:PHI 5000 Versa Prob II,FEI Inc.



Features

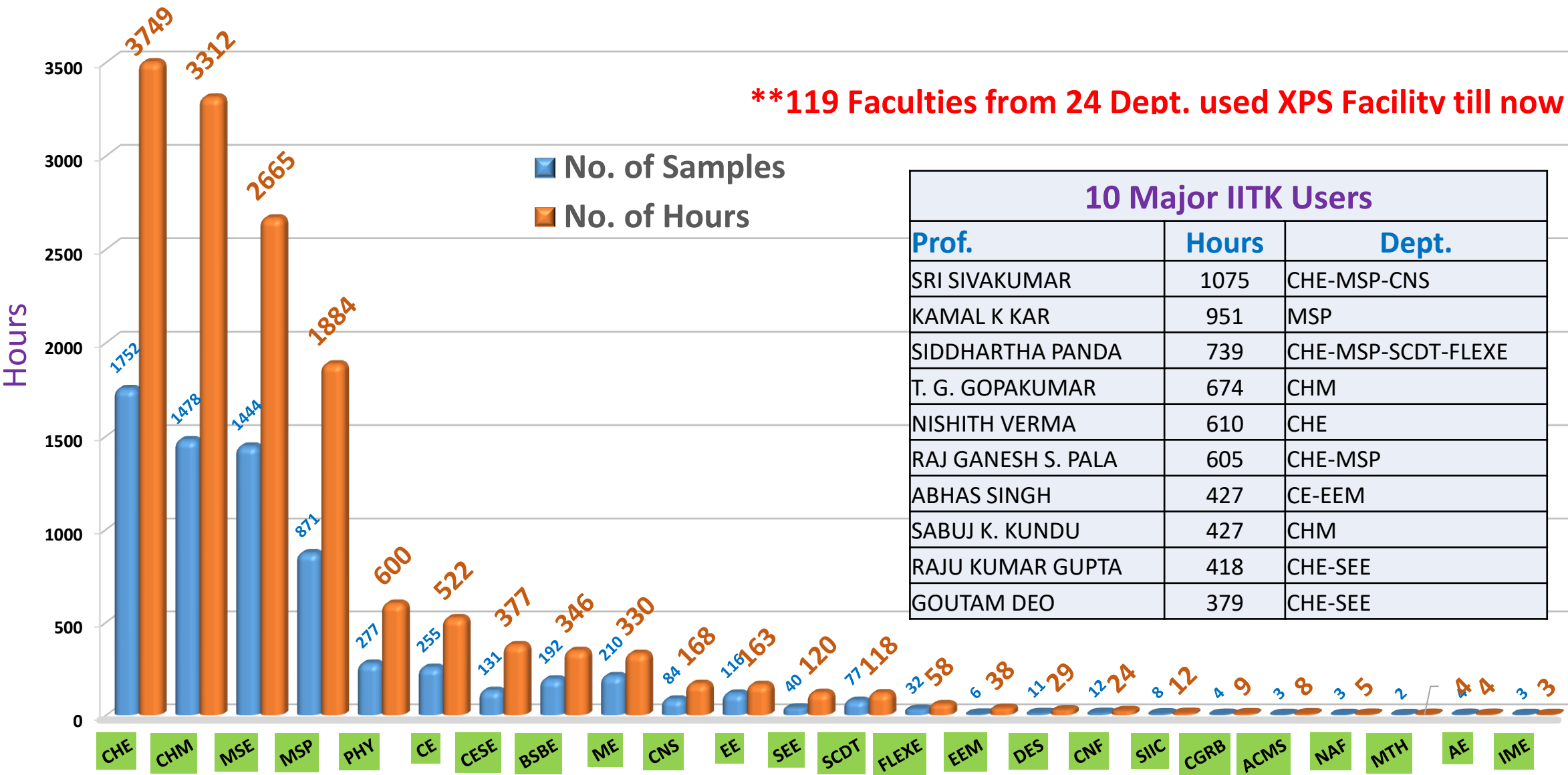
- Analysis limited up to 7.5nm from top of surface.
- Confirm what kind of element exist in surface.
- Calculate the composition of the detected element on the surface.
- Analyze the chemical structure of the detected element.
- Spot sizes from $< 10 \mu\text{m}$ to $200 \mu\text{m}$.
- Rotating anode($\text{Al-K}\alpha$), 100 W20KV
 $100 \mu\text{m}$ diameter x-ray beam is scanned up to 1.4 mm area.
- C60 sputter ion gun for clean polymer surfaces without causing significant chemical damage.

❖ *Depth profiling, Elemental Mapping and Angle dependent non destructive profiling can also scan.*

Instrument	PO No.	DATED	COST
Scanning ESCA Microprobe etc.	P/IMP/2013-14/NC-2457	11-04-2013	USD 999,850

Usage Statistics of XPS System **Within IITK** by various Departments and Centers

****119 Faculties from 24 Dept. used XPS Facility till now**



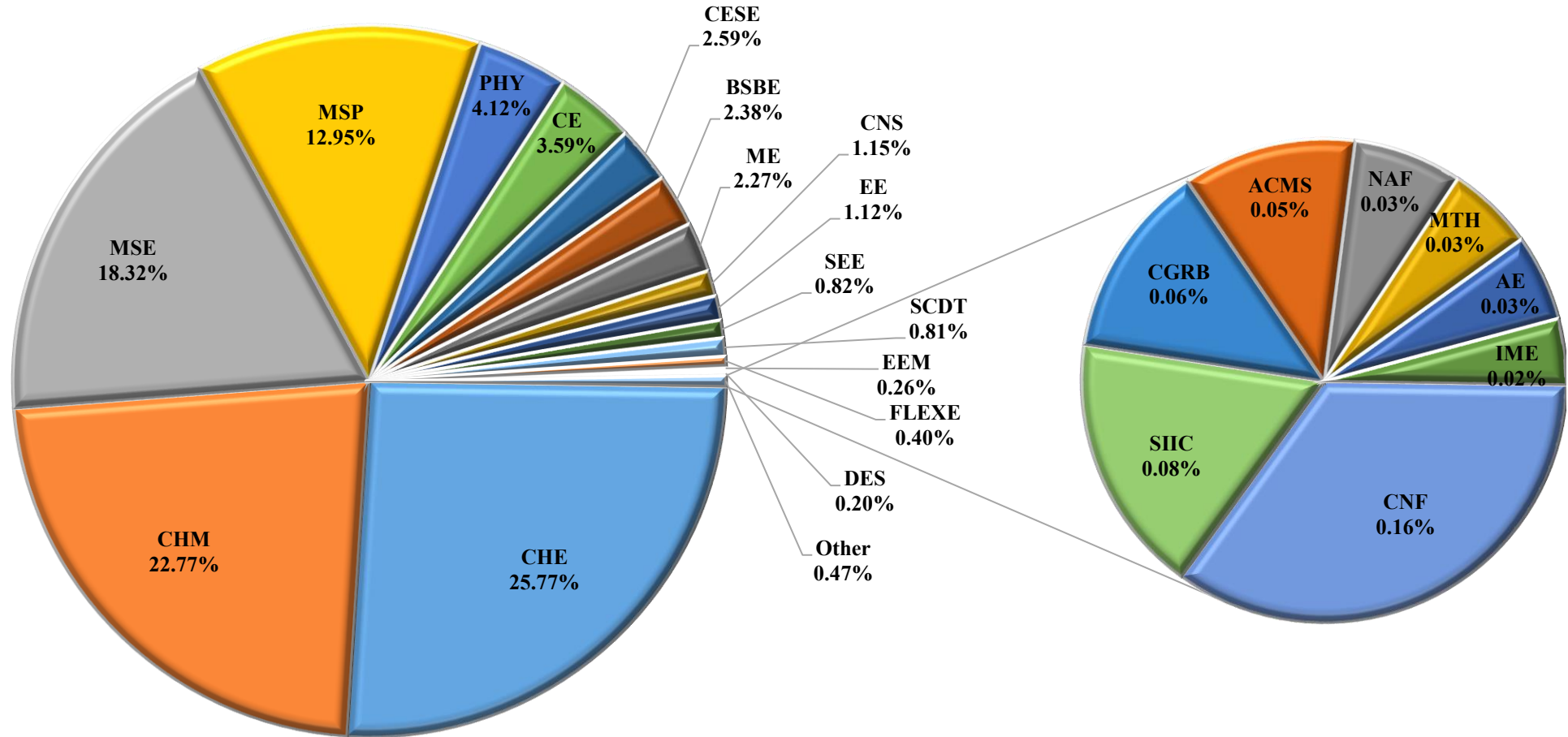
10 Major IITK Users		
Prof.	Hours	Dept.
SRI SIVAKUMAR	1075	CHE-MSP-CNS
KAMAL K KAR	951	MSP
SIDDHARTHA PANDA	739	CHE-MSP-SCDT-FLEXE
T. G. GOPAKUMAR	674	CHM
NISHITH VERMA	610	CHE
RAJ GANESH S. PALA	605	CHE-MSP
ABHAS SINGH	427	CE-EEM
SABUJ K. KUNDU	427	CHM
RAJU KUMAR GUPTA	418	CHE-SEE
GOUTAM DEO	379	CHE-SEE

- Total **7,052 Samples** so far tested in XPS Lab in over **14,620 hrs** of usage of facilities **with in IITK**.

Usage Statistics of XPS System **Within IITK** by various Departments and Centers

Dept.	Hours	Samples
CHE	3749	1752
CHM	3312	1478
MSE	2665	1444
MSP	1884	871
PHY	600	277
CE	522	255
CESE	377	131
BSBE	346	192
ME	330	210
CNS	168	84
EE	163	116
SEE	120	40
SCDT	118	77
FLEXE	58	32
EEM	38	6
DES	29	11
CNF	24	12
SIIC	12	8
CGRB	9	4
ACMS	8	3
NAF	5	3
MTH	4	2
AE	4	4
IME	3	3
TOTAL	14548	7015

- CHE
- CHM
- MSE
- MSP
- PHY
- CE
- CESE
- BSBE
- ME
- CNS
- EE
- SEE
- SCDT
- FLEXE
- EEM
- DES
- CNF
- SIIC
- CGRB
- ACMS
- NAF
- MTH
- AE
- IME

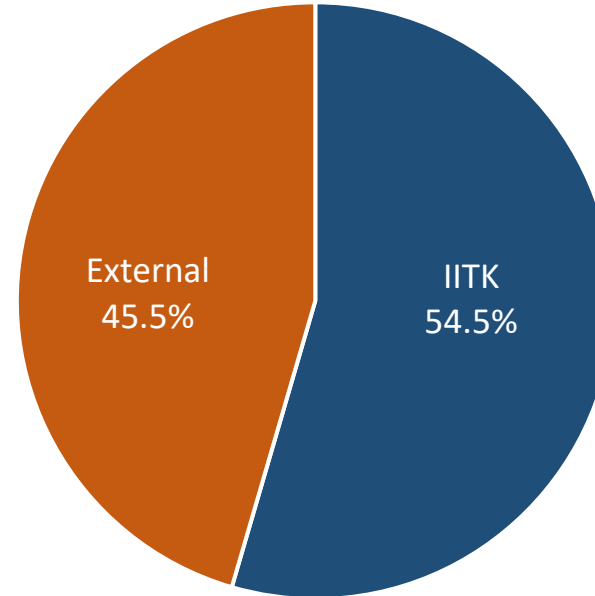


80% facility usage time is by 4 departments e.i. CHE-CHM-MSE-MSP
 15% by 5 departments e.i. PHY-CE-CESE-BSBE and remaining
 5% by other departments.

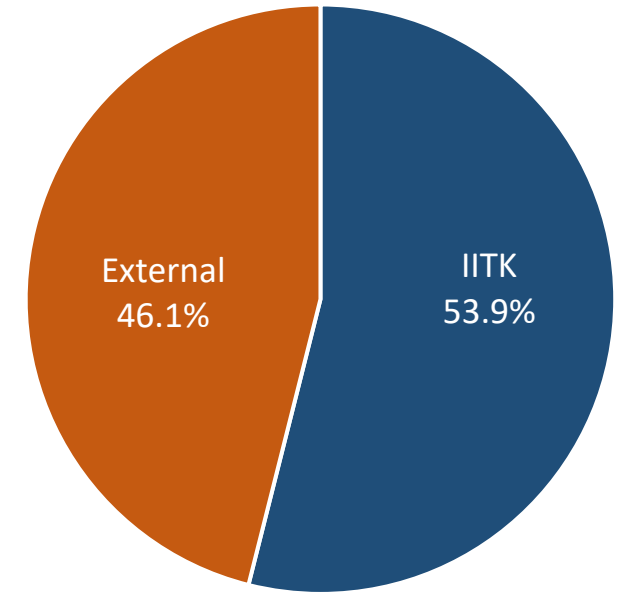
Usage Statistics of XPS Lab by IITK (Internal) and Non-IITK (External) Users

Year	IITK Users		External Users	
	Samples	Hours	Samples	Hours
2014	99	207	14	38
2015	535	1240	120	385
2016	716	1269	406	1052
2017	704	1292	838	1991
2018	647	1159	1176	2380
2019	613	1350	1177	2491
2020	400	835	386	820
2021	571	1254	611	1065
2022	667	1409	516	1029
2023	947	2001	292	606
2024	1116	2532	317	571
Total	7015 <i>Samples (IITK)</i>	14548 <i>hrs (IITK)</i>	5853 <i>samples (Ext)</i>	12428 <i>hrs (Ext)</i>

Total Number of Samples Tested: 12,868



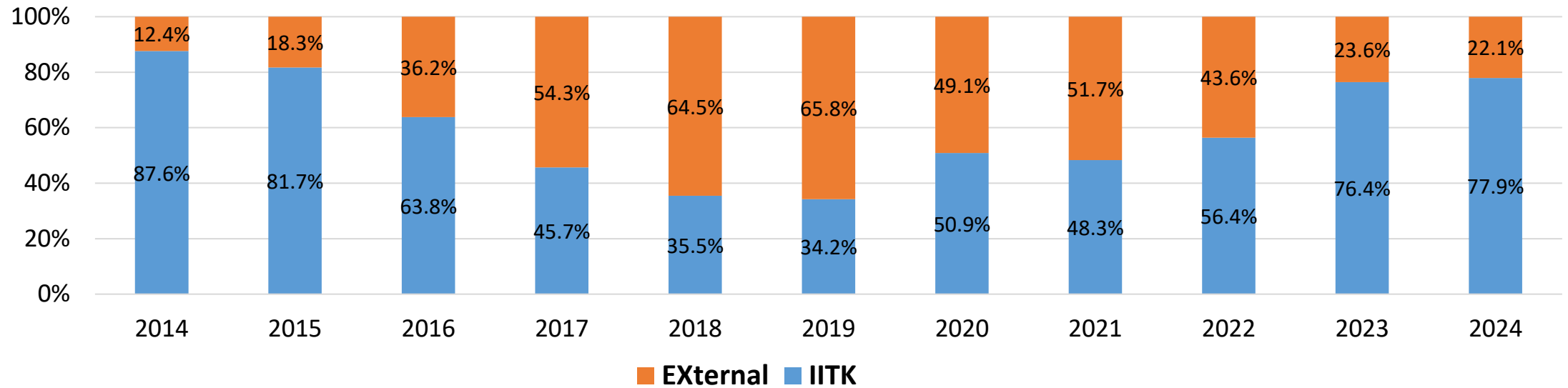
Total Usage Time: 26,976 hrs



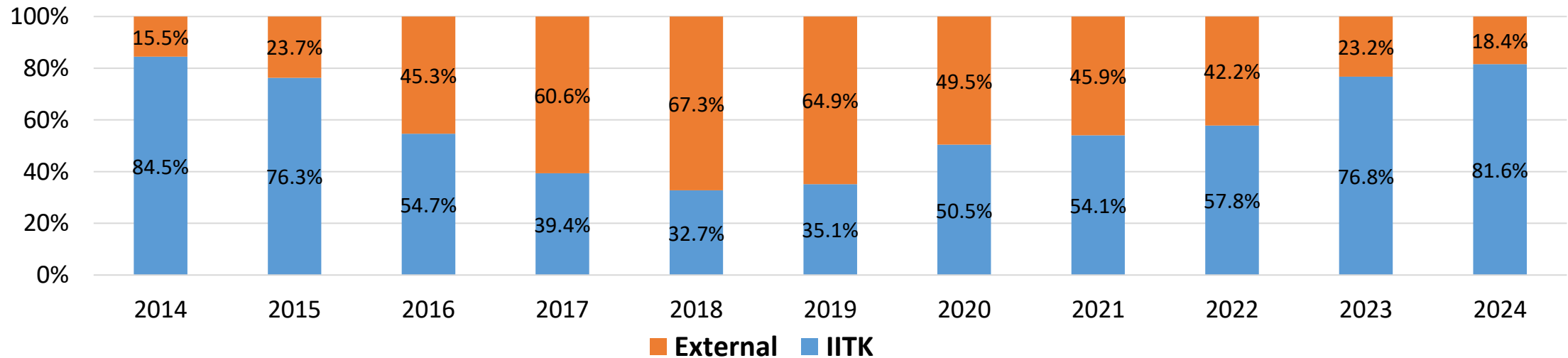
- Total **12,868 Samples** so far tested in XPS Lab in over **26,976 hrs** of usage of facilities.
- Out of total overall usage, **45.5% of samples** and **46% of usage time** is by **External Users**

Usage Statistics of XPS Lab by **IITK (Internal)** and **Non-IITK (External)** Users

%age Share of Overall Samples Tested by IITK vs External Users



%age share of Overall Usage Time from IITK vs External Users



Summary of Usage Statistics of **XPS Lab Facility** till 31th Dec. 2024

Year	IITK		Non-IITK		Sub-Total	
	SAMPLES	HOURS	SAMPLES	HOURS	SAMPLES	HOURS
2014	99	207	14	38	113	245
2015	535	1240	120	385	655	1625
2016	716	1269	406	1052	1122	2321
2017	704	1292	838	1991	1542	3283
2018	647	1159	1176	2380	1823	3539
2019	613	1350	1177	2491	1790	3841
2020	400	835	386	820	786	1655
2021	571	1254	611	1065	1182	2319
2022	667	1409	516	1029	1183	2438
2023	947	2001	292	606	1239	2607
2024	1116	2532	317	571	1433	3103
Total	7015	14548	5853	12428	12868	26976

Testing Charges for XPS Facilities at ACMS

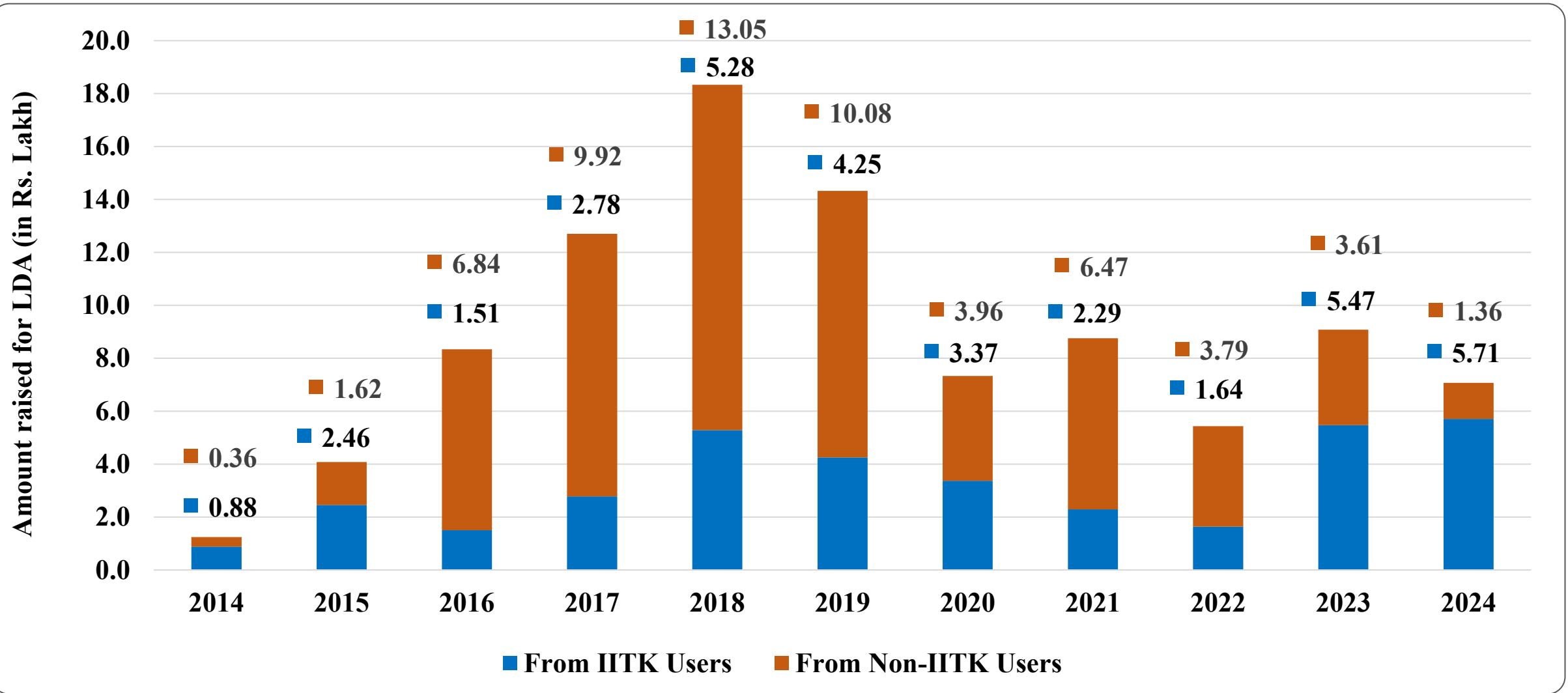
S.No.	User Category	Charge per slot of 3 hours analysis time	Analysis with depth profiling to be charged hourly basis
1	Users from IITK Academic Community	Rs. 1000	Rs.600 per hour
2	Users from Non-IITK Academic Institution	Rs. 3000 + Service tax**	Rs. 1800 per hour + Service tax
3	Users from any Government funded National laboratory	Rs. 5000 + Service tax**	Rs. 3000 per hour + Service tax
4	Users from any industry or private laboratory	Rs. 10,000 + Service tax**	Rs. 6000 per hour + Service tax

Revenue generated from the XPS Lab facility (from 2014 to 2024)

Year	Non - IITK Users			IITK Users	Total Amount in LDA
	Amount received (excluding tax ₹)	R&D Share (₹)	Facility LDA Share (₹)	Amount Received in LDA (₹)	
2014	64474	21276	36105	88200	124305
2015	289174	95427	161937	245900	407837
2016	1220669	402821	683575	150650	834225
2017	1771767	584683	992190	277700	1269890
2018	2330614	769103	1305144	528100	1833244
2019	1799584	593863	1007767	425000	1432767
2020	707251	233393	396061	336630	732691
2021	1154982	381144	646790	228800	875590
2022	677338	223522	379309	163700	543009
2023	643988	212516	360633	546900	907533
2024	401143	132377.19	136388.62	571000	707389
Total	₹ 1,10,60,984.0	₹ 36,50,125.2	₹ 61,05,899.6	₹ 35,62,580.0	₹ 96,68,479.6

Total Revenue generated through IITK users and Non IITK users is ₹ 1,46,23,564

Revenue Generated from IITK (Internal) and Non-IITK (External) Users



Cause of Decline in Non-IITK Users

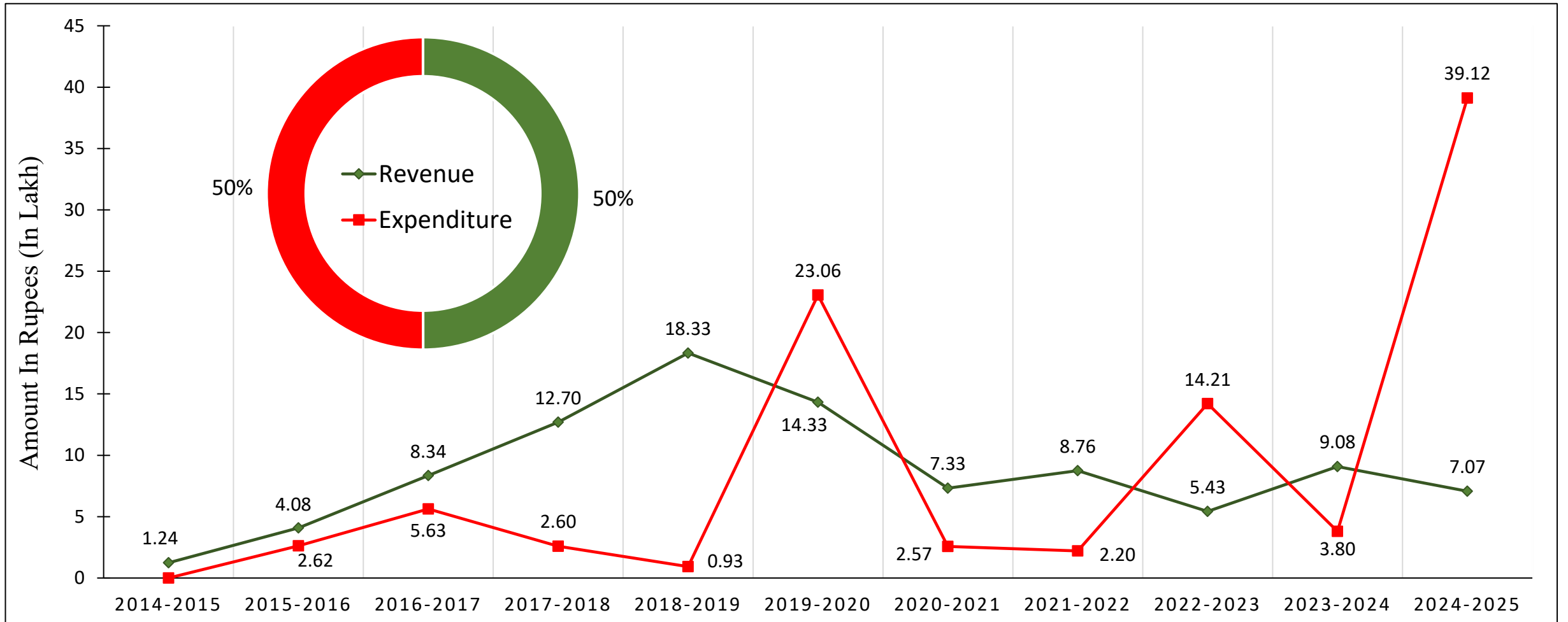
- Non-IITK users are declining due to the installation of many upgraded versions of the XPS system in their own or nearby institutions.

Detail of Expenditure Incurred for XPS Facility Over the Year

Year	Po. No.	Description	Source of fund			Total Amount
			From LDA	From ACMS budget	Institute Spl. Grant	
2015-2016	P/ACMS/RD/2015-16/1/82	Spare Part	2,62,200	Nil	Nil	2,62,200
2016-2017	P/MSE/2016-2017/496	Spare Part	3,63,462	2,00,000	Nil	5,63,462
2017-2018	P/ACMS/2017-18/113	Spare Part	1,49,600	1,10,000	Nil	2,59,600
2018-2019	P/ACMS10E/2018-19/3/314	UPS Battery	43,000	50,000	Nil	93,000
2019-2020	P/IMP/2019-20/LTA-638	Spare Parts	Nil	8,07,562	Nil	8,07,562
	W/ACMS/2019-20/133/792	AMC (2020-22)	11,65,021	3,32,930	Nil	14,97,951
2020-2021	P/IMP/202021/CO-2540	Spare Part	Nil	2,57,000	Nil	2,57,000
2021-2022	Nil	Nil	Nil	Nil	Nil	0
2022-2023	P/ACMS/RD/2022-2023/4/388	UPS Battery	96,000	Nil	Nil	96,000
	P/ACMS/RD/2022-23/3/396	Ion-gun Controller & Spare	12,69,732	Nil	Nil	12,69,732
	P/ACMS/10E/2022-23/3/420	PC Desktop	Nil	55449	Nil	55,449
2023-2024	W/ACMS2023-24/110/578	Spare Part	Nil	3,79,936	Nil	3,79,936
2024-2025	W/ACMS/RD/2022-23/59/898	On call Service (2023-24)	**7,43,400	Nil	Nil	7,43,400
	P/ACMS/20E/2024-2025/561	Ion-gun Controller & X-ray Anode	Nil	Nil	1930000	19,30,000
	W/ACMS/RD/2024-25/141/1374	On call Service (2024-25)	12,39,000	Nil	Nil	12,39,000
Since, 2014	Miscellaneous Expenditure		2,20,000	Nil	Nil	2,20,000
Total			₹ 55,51,415	₹ 21,92,877	₹ 19,30,000	₹ 96,74,292

****On call service costed only 7.4 Lakhs whereas AMC costed 15 Lakhs in 2019, so it is advisable to opt On call service rather than opting AMC.**

Revenue Generated (from User Charges) versus Expenditure (in Maintenance and Repair)



- Since installation (2013-14) to till date so far Rs 96.7 Lakhs has been spent for XPS facility upkeep. out of which Rs **55.5 Lakhs (57% of total) is from Lab Development Account (LDA)** which has been sustained through User Charges. The remainder part of Maintenance Expenses for XPS facilities **Rs 41.2 Lakhs (43% of total)** was through ACMS Budget & Special Institute Grant.
- Till date, the LDA of XPS Lab has generated Rs 96.7 Lakh.** After taking into consideration maintenance and repair expenses of facilities and contribution to R&D account, **as on 28 July 2026, LDA of XPS Lab@ACMS has Rs 33 Lakh!**

Key External Users of XPS Facility at ACMS from IIT's, NIT's R&D organizations and Industries

▪ IIT Kharagpur ▪ IIT Bombay ▪ IIT Madras ▪ IIT Delhi ▪ IIT Guwahati ▪ IIT Roorkee ▪ IIT Ropar ▪ IIT Bhubaneswar ▪ IIT Gandhinagar ▪ IIT Hyderabad ▪ IIT Jodhpur ▪ IIT Patna ▪ IIT Indore ▪ IIT Mandi ▪ IIT (ISM) Dhanbad ▪ IIT BHU	▪ NIT Trichy ▪ NIT Surathkal ▪ NIT Warangal ▪ NIT Rourkela ▪ NIT Calicut ▪ NIT Durgapur ▪ NIT Allahabad ▪ NIT Kurukshetra ▪ NIT Jamshedpur ▪ NIT Bhopal ▪ NIT Jaipur ▪ NIT Patna ▪ NIT Silchar ▪ NIT Hamirpur ▪ NIT Jalandhar ▪ NIT Raipur ▪ NIT Sikkim	▪ CSIR Jamshedpur ▪ CSIR-IIP Dehradun ▪ CSIR-NEIST Jorhat, Assam ▪ CSIR-CIMFR Dhanbad ▪ CSIR-IITR Lucknow ▪ CSIR-CDRI Lucknow ▪ CSIR-IHBT Palampur H.P. ▪ CSIR-CMERI Durgapur W.B ▪ CSIR-IMMT Bhubaneswar Odisha ▪ CSIR-CSIO CHANDIGARH ▪ CSIR Bhubaneswar Odisha ▪ CSIR-IITR Lucknow
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More than 50 Reginal Engineering College(REC)

List of Faculty users from different departments

1	SRI SIVAKUMAR	467	1075	CHE-MSP-CNS
2	KAMAL K KAR	457	951	MSP
3	SIDDHARTHA PANDA	310	739	CHE-MSP-SCDT-FLEXE
4	T. G. GOPAKUMAR	202	674	CHM
5	NISHITH VERMA	280	610	CHE
6	RAJ GANESH S. PALA	241	605	CHE-MSP
7	ABHAS SINGH	195	427	CE-EEM
8	SABUJ K. KUNDU	214	427	CHM
9	RAJU KUMAR GUPTA	210	418	CHE-SEE
10	GOUTAM DEO	180	379	CHE-SEE
11	TANMOY MAITI	157	355	MSE
12	ASHUTOSH SHARMA	172	353	CHE
13	PRATIK SEN	145	352	CHM
14	NALINI SANKARARAMAKRISHAN	122	349	CESE
15	P. C. MONDAL	159	331	CHM
16	VIVEK VERMA	188	284	MSE
17	MONICA KATIYAR	164	276	MSE-CHE-SCDT-FLEXE
18	VISHAL GOVIND RAO	107	265	CHM
19	KANTESH BALANI	134	257	MSE
20	ANSHU GAUR	156	249	MSE
21	KRISHANU BISWAS	75	230	MSE
22	SANDEEP VERMA	107	197	CHM-CNS
23	SHOBIT OMAR	98	192	MSE
24	CHANCHAL SOW	82	172	PHY
25	S. P. RATH	116	169	CHM
26	J. RAMKUMAR	110	163	MSP-ME
27	ASHISH GARG	97	158	MSE-SEE
28	KALLOL MONDAL	75	155	MSE
29	APPA RAO	66	152	CHM
30	SANTANU BHATTACHARYA	83	151	ME-DES

31	M. JALEEL AKHTAR	89	150	MSP
32	SOUMIK MUKHOPADHYAY	49	143	MSP-PHY
33	J. N. MOORTHY	73	143	CHM
34	MAINAK DAS	83	141	BSBE-DES-FLEXE
35	SHIKHAR K. JHA	74	133	MSE
36	PRABHAT DWIVEDI	67	131	CNS-CNF
37	SARANG INGOLE	123	128	MSE
38	NANDINI GUPTA	62	104	EE
39	J. K. BERA	45	99	CHM
40	SUDHANSHU SHEKHAR	38	93	MSE
41	GURUNATH RAMANATHAN	44	89	CHM
42	SUDEEP BHATTACHARJEE	44	87	PHY
43	RAJEEV GUPTA	40	82	PHY-MSP
44	ANIMANGSU GHATAK	54	81	CHE
45	ASHOK KUMAR	34	74	BSBE
46	SANTOSH K. MISRA	37	74	BSBE
47	NIRAJ SINHA	39	72	ME
48	AVINASH KUMAR AGARWAL	55	67	ME
49	AMIT VERMA	57	64	EE-MSP
50	K. S. NALWA	22	63	SEE
51	PURNENDU BOSE	33	62	CE
52	R. N. MUKHERJEE	18	62	CHM
53	ADITYA H. KELKAR	13	61	PHY
54	ZAKIR HOSSAIN	31	58	PHY
55	BASKER SUNDARARAJU	24	53	CHM
56	RAGHUPATHY YUVARAJ	32	52	MSE
57	GOUTHAMA	17	50	MSE
58	MANABENDRA CHANDRA	31	49	CHM
59	ASHIS K. PATRA	23	48	CHM
60	HIMANSHU SHARMA	20	48	CHE

61	ANANTHARAJ SENGANI	26	45	CHM
62	RITIKA GAUTAM	14	43	CHM
63	Y.N. MOHAPATRA	17	42	MSP-PHY
64	DHIRENDRA S. KATTI	24	41	BSBE
65	JAYANT K. SINGH	23	41	CHE
66	S. SUNDAR KUMAR IYER	22	36	SCDT-FLEXE
67	R. VIJAYA	32	35	PHY
68	SHIKHAR MISHRA	20	30	MSE
69	KRISHNACHARYA KHARE	16	29	PHY
70	PARIMAL K. BHARADWAJ	16	29	CHM
71	ANUBHA GOEL	11	28	EEM-CESE
72	RAM KRISHNA UPADHYAY	20	28	ME
73	NILESH PRAKASH GURAO	7	26	MSE
74	DR ASHUTOSH TRIPATHI	15	26	SCDT
75	YOGESH M. JOSHI	13	25	CHE-MSP
76	MUKESH SHARMA	11	22	CE
77	ASHWANI KUMAR THAKUR	18	22	BSBE
78	P.K BHARDWAJ	15	22	CHM
79	MANAS K GHORAI	8	21	CHM
80	VENKATA SURESH MOTHIKA	13	21	CHM
81	ANURAG TRIPATHI	12	20	CHM
82	D.H. DETHE	7	19	CHM
83	ANANDH SUBRAMANIAM	13	18	MSE
84	SHYAM NAIR	6	18	CE
85	VINOD K SINGH	7	15	CHM
86	MANISH MADHUKAR KULKARNI	6	14	CNS
87	RAHUL SARKAR	4	14	MSE
88	SHASHANK SHEKHAR	6	12	MSE
89	UPENDRA	3	12	PHY
90	ALOK RANJAN VERMA	8	12	EE
91	MANOJ KUMAR	4	10	CE
92	DEEPAK GUPTA	4	9	MSE
93	ANJAN KUMAR GUPTA	4	9	PHY

94	VINOD TARE	4	9	CGRB
95	VISHAL AGARWAL	4	9	CHE
96	SUDARSHAN NARAYAN	3	9	SEE
97	AMITABHA BANDYOPADHYAY	4	8	SIIC
98	A.K. SINGH	2	8	MSE
99	G. ANANTHARAMAN	3	8	CHM
100	R. S. RAMAKRISHNA	2	8	CESE
101	SHIVA KANT MISHRA	4	8	MSE
102	DR. SUMIT CHHANGANI	3	8	ACMS
103	DEBAJYOTI PAUL	4	7	CE
104	DR JAI PRAKASH	4	6	CHE
105	K.P RAJEEV	4	6	PHY
106	SATYAJIT BANERJEE	4	6	PHY
107	TARUN GUPTA	4	6	CE
108	CHANDRA PRAKASH	7	5	ME
109	VAIBHAV ARGHODE	2	5	SEE
110	S. N. TRIPATHI	3	5	NAF
111	SAURABH	2	4	MTH
112	ANKUSH SHARMA	4	4	SIIC
113	PRITAM CHAKRABORTY	4	4	AE
114	ARVIND KUMAR	1	3	ME
115	DEEPU PHILIP	3	3	IME
116	S.K. CHOUDHURY	4	3	ME
117	P. K. BHATTACHARYA	3	3	CHE
118	NAGMA PRAVEEN	2	3	CHM
119	V. CHANDRASHEKAR	3	2	CHM
Total		7052	14620	
		Samples	Hours	

Overall Assessment of XPS Facility at ACMS

LIMITATIONS:

1. UV Photoelectron Spectroscopy capacity which falls short of requirements of many IITK and Non-IITK users.
2. Expenditure in repairing and maintenance is increasing significantly.

CAPABILITY:

1. Well trained staffs capable enough to handle modern instrumentation and software.
2. ACMS is well supported by Institute in terms of infrastructural resources (e.g. uninterrupted power supply)
3. Expert faculty members of IITK working on various research areas.

SCOPE:

1. Need of UV Photoelectron Spectroscopy as attachment Modul.
2. Need of system upgradation so for operatable under variable environmental conditions.



Advanced Centre for Materials Science Indian Institute of Technology Kanpur

Usage Statistics and Fiscal Status Report

X-Ray Diffraction Facility

(XRD Lab, Room 106, ACMS)

Dr. Anish Upadhyaya

(Head, ACMS)

Dr. Nilesh P Gurao

(Faculty In-charge, XRD Lab)

Mr. Ashish Tiwari

(TS, XRD Lab Staff In-charge)

Mr. Mitesh Shrotriya

(ST, XRD Lab Staff)

About the facility

The X-Ray Diffraction Facility has three state of the art X-ray diffractometers which offer a wide range of materials characterization using X-rays for bulk materials, nano materials as well as thin films. All three instruments are installed in 2014.

The facility offers:

- Ambient and high temperature (1400°C) powder/polycrystalline diffraction
- Grazing incidence diffraction for thin films
- Small Angle X-ray Scattering (SAXS)
- Texture and Residual stress measurement
- X-ray reflectivity
- Rocking curve
- Reciprocal space mapping



XRD UNIT	XRD Unit Name	Purchase order	Date	Amount(INR)
Unit-1	Panalytical X'Pert Powder	P/IMP/2012-13/NC-2432	31/3/2013	1,34,84,325/- (EUR 193796.00)
Unit-2	Rigaku MiniFlex 600	P/IMP/2012-13/NC-2436	31/3/2013	1,51,13,165/- (YEN 26514325.00)
Unit-3	Rigaku Ultima IV(Four Circle Diffractometer)			

Summary of ACMS X-Ray Diffraction (XRD) Facility

- Total **3 instruments** are installed in the X-Ray Diffraction Lab (XRD) at ACMS.
- Over **31,123 Samples** have been tested so far between 2014 to July 2026 at XRD Lab.
- Total **29,461 Hours** of equipment usage time utilized in conducting various Mechanical Tests.
- **~30% of total users** are **External** (including National and Regional Academic Institutions ; R&D Organisation; and Industries).
- Faculty, Research Scholars and Students from **15 Departments and Centers at IIT Kanpur** have utilized XRD facilities since their installation in 2014.
- A total revenue of around **Rs 29.67 Lakh generated and contributed to LDA of XRD Lab** till date.
- The facility has operated in **self-sustained mode** and met **~30%** of its expenditures through LDA and balance **70%** from ACMS Budget. After taking into consideration, expenditures incurred for upgradation, maintenance and repairs, **XRD LDA has still has balance of Rs 24.97 Lakhs as on 24.07.2026.**
- Since its inception, XRD Facility at ACMS has not sought any special Grant / Funds from Institute.

Revenue generated in XRD facility through Internal and External Users

XRD Facility, ACMS				
Year	IIT K	LDA Account	NON IIT K	Testing Account
2015	261800	ACMS/2014219	98232	T15-05
2016	236100		100079	16-04
2017	167900		103021	T17-05
2018	502376		208000	T18-05
2019	616531	ACMS/2019318	161100	T19-05
2020	198900		62539	T20-05
2021	196700		47200	T21-05
2022	198100		71700	T22-05
2023	171200	ACMS/ 2024343	129832	T23-05
2024	207050		98526	T24-05
2025	171100		64937	T25-05
up to July 2026	39000		44884	T26-05
Total Amount(Rs.)	2966757		1190050	

Revenue Generation from External Users

Year	External /IITK	Remarks
2015	₹ 98,232	These Amount have been disbursed within R&D IIT K, LDA (2024343) and ACMS staff
2016	₹ 1,00,079	
2017	₹ 1,03,021	
2018	₹ 2,08,000	
2019	₹ 1,61,100	
2020	₹ 62,539	
2021	₹ 47,200	
2022	₹ 71,700	
2023	₹ 1,29,832	
2024	₹ 98,526	
2025	₹ 64,937	
2026(July)	₹ 44,884	
Total work done from External users →	₹ 11,90,050	

Current Testing Account number T26-05

Project Expenditure Summary

Statement of Expenditure

From 01-04-2024 To 24-07-2026

Date: 24-07-2026

Financial Year

ALL

View Details

Project Number:

Agency Name:

Project Type:

Project Category:

Period:

Project Start Date:

Sanctioned Letter No.:

*** Opening Balance (A):

MISC /ACMS/T24-05

MISCELLANEOUS

TNR

INDUSTRY

1 Year(S);

01-04-2024

LETTER

₹ 0

Project Title:

Principal Investigator:

Nation Code:

Sanctioned Amount:

0 Month(S):

Project Expiry Date:

Sanctioned Date:

Project Closed:

Xrd Facility Acms Testing

Anish Upadhyaya

INDI

₹ 0

0 Week(S)

31-03-2025

01-04-2024

Yes

Select "ALL" For Full Details

Advance Search

View CO-Pls

View PA

Budget Head	Grant Sanctioned	Actual Funds Received	Refunds	Expenditure			Net Expenditure	Balance Against Sanctioned
	(A)	(B)	(C)	Actual Expenses (D1)	Committed Expenses (D2)	Total (D1+D2)	E (D-C)	F (A-E)
CGST	0	2477	1367	3782	0	3782	2415	-2415
GRANTR	0	137813	0	0	0	0	0	0
GRANTR	0	0	0	73000	0	73000	73000	-73000
IGST	0	17478	0	17478	0	17478	17478	-17478
SGST	0	2477	1367	3782	0	3782	2415	-2415
CONTR	0	0	128649	128649	0	128649	0	0
Total: ₹	***0	160245	131383	226691	0	226691	95308	-95308
Net Expenditure (Including Committed) (E): ₹ 95308								
*** (Project With Flexibility Head) Overall Balance Against Funds Received Till Now (D+B-E): ₹ 64937								
*** Since Budget Head Wise Sanctioned Amount Is 0, Therefore Total Sanctioned Amount Of Project Is Dispayed.								

Statement of Expenditure

From 01-04-2025 To 24-07-2026

Date: 24-07-2026

Financial Year

ALL

View Details

Project Number:

Agency Name:

Project Type:

Project Category:

Period:

Project Start Date:

Sanctioned Letter No.:

*** Balance Limit:

MISC /ACMS/T25-05

MISCELLANEOUS

TNR

INDUSTRY

1 Year(S);

01-04-2025

N/A

0

Project Title:

Principal Investigator:

Nation Code:

Sanctioned Amount:

0 Month(S):

Project Expiry Date:

Sanctioned Date:

Project Closed:

Xrd Facility Acms Testing

Anish Upadhyaya

INDI

₹ 0

0 Week(S)

31-03-2026

N/A

Yes

Select "ALL" For Full Details

Advance Search

View CO-Pls

View PA

Budget Head	Grant Sanctioned	Actual Funds Received	Refunds	Expenditure			Net Expenditure	Balance Against Sanctioned
	(A)	(B)	(C)	Actual Expenses (D1)	Committed Expenses (D2)	Total (D1+D2)	E (D-C)	F (A-E)
CGST	0	2528	0	2618	0	2618	2618	-2618
GRANTR	0	45064	0	0	0	0	0	0
IGST	0	1674	1440	3114	0	3114	1674	-1674
SGST	0	2528	0	2618	0	2618	2618	-2618
Total: ₹	***0	51794	1440	8350	0	8350	6910	-6910
Net Expenditure (Including Committed) (E): ₹ 6910								
*** Overall Balance Against Funds Received Till Now (D+B-E): ₹ 44884								
*** Since Budget Head Wise Sanctioned Amount Is 0, Therefore Total Sanctioned Amount Of Project Is Dispayed.								

Revenue Generation from Internal Users

Year	Internal IITK
2015	₹ 2,61,800
2016	₹ 2,36,100
2017	₹ 1,67,900
2018	₹ 5,02,376
2019	₹ 6,16,531
2020	₹ 1,98,900
2021	₹ 1,96,700
2022	₹ 1,98,100
2023	₹ 1,71,200
2024	₹ 2,07,050
2025	₹ 1,71,100
2026(July)	₹ 39,000

Project Expenditure Summary

Statement of Expenditure
From 08-10-2024 To 24-07-2026

Date: 24-07-2026

Financial Year
ALL
[View Details](#)

Project Number: IITK /ACMS/2024343
Agency Name: INDIAN INSTITUTE OF TECHNOLOGY
Project Type: LDA
Project Category: IIT KANPUR & OTHERS
Period: 3 Year(S);
Project Start Date: 08-10-2024

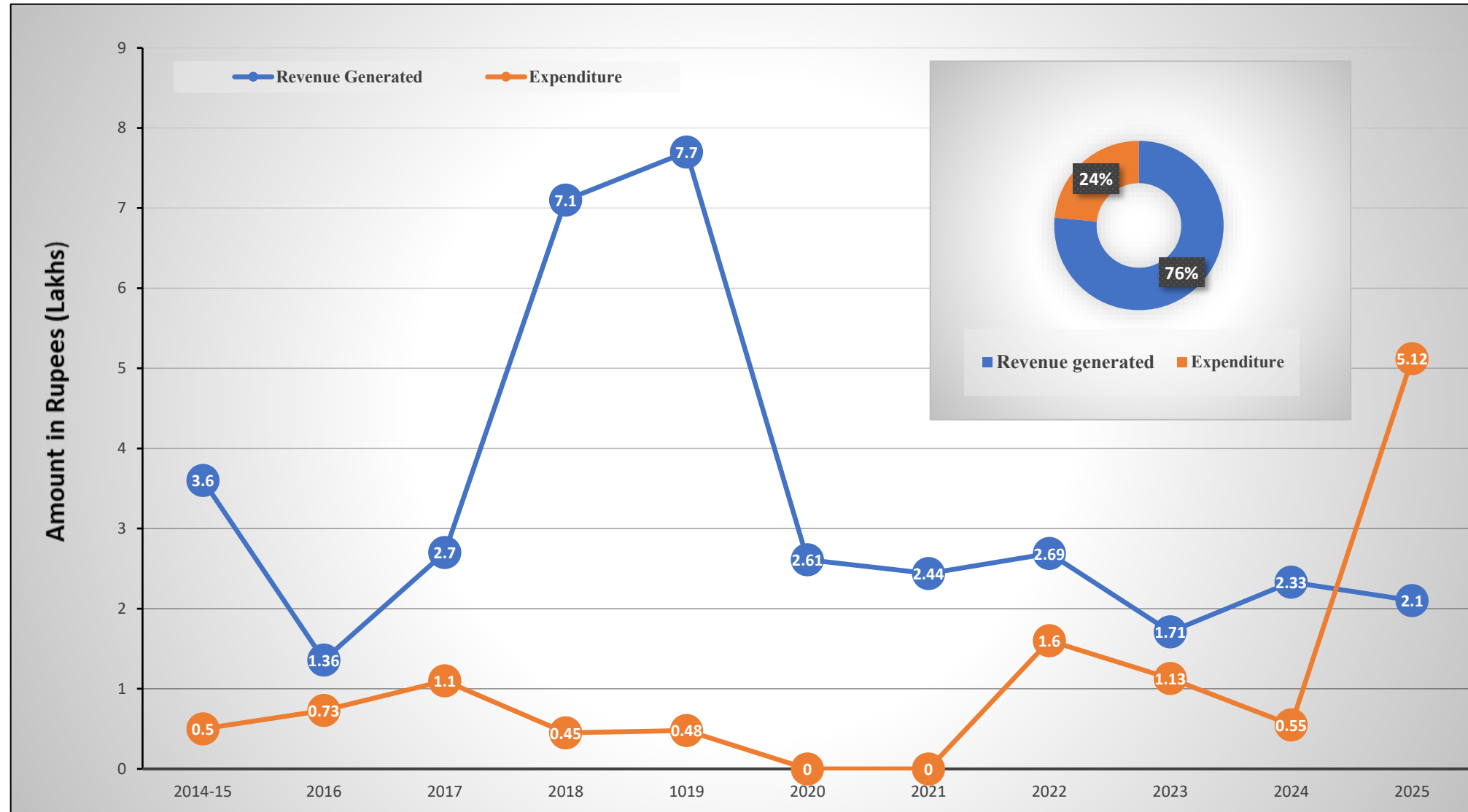
Project Title: Acms Xrd Facility
Principal Investigator: Nilesh Prakash Gurao
Nation Code: INDI
Sanctioned Amount: ₹ 0
0 Month(S);
Project Expiry Date: 07-10-2027

Select "ALL" For
Full Details
[Advance Search](#)
[View CO-PIs](#)

Budget Head	Grant Sanctioned	Actual Funds Received	Refunds	Expenditure			Net Expenditure	Balance Against Sanctioned
	(A)	(B)	(C)	Actual Expenses (D1)	Committed Expenses (D2)	Total D (D1+D2)	E (D-C)	F (A-E)
GRANTR	0	2587814	0	0	0	0	0	0
CONS	0	0	20000	451719	153191	604910	584910	-584910
CONTG	0	0	494354	0	0	0	-494354	494354
Total: ₹	***0	2587814	514354	451719	153191	604910	90556	-90556
Net Expenditure (Including Committed) (E): ₹ 90556								
*** (Project With Flexibility Head) Overall Balance Against Funds Received Till Now (O+B-E): ₹ 2497258								
*** Since Budget Head Wise Sanctioned Amount Is 0, Therefore Total Sanctioned Amount Of Project Is Dispayed.								

Current Amount in LDA- A/C No. 2024343 ₹ 24,97,258 -/-

Revenue Generated Vs Expenditure



Overall User Statistics from inception to July 2026

XRD Unit	No. of samples	Usage hours
Unit-1	20704	15585
Unit-2	9186	5886
Unit-3	1233	7990
Total	31,123	29,461

On average, 11 samples are analyzed per day, taking more than 10 hours per day

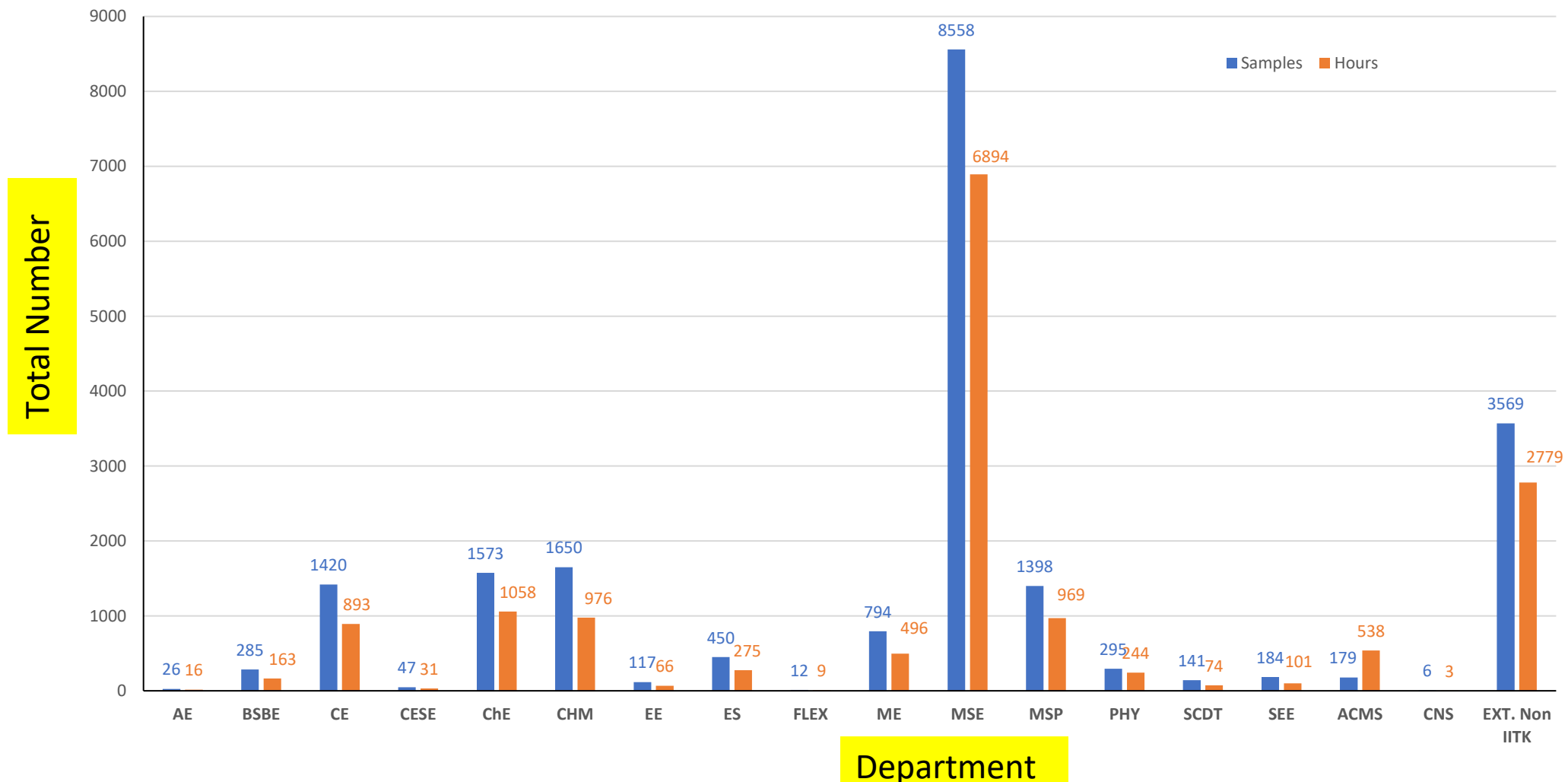
Current Amount in LDA, A/C No. 2024343 - ₹ 24,97,258 /-

*Details are in the Fund Generation slide

PANalytical X'Pert Powder Usage from 2014 to July 2026

Total No. of samples analyzed- 20704

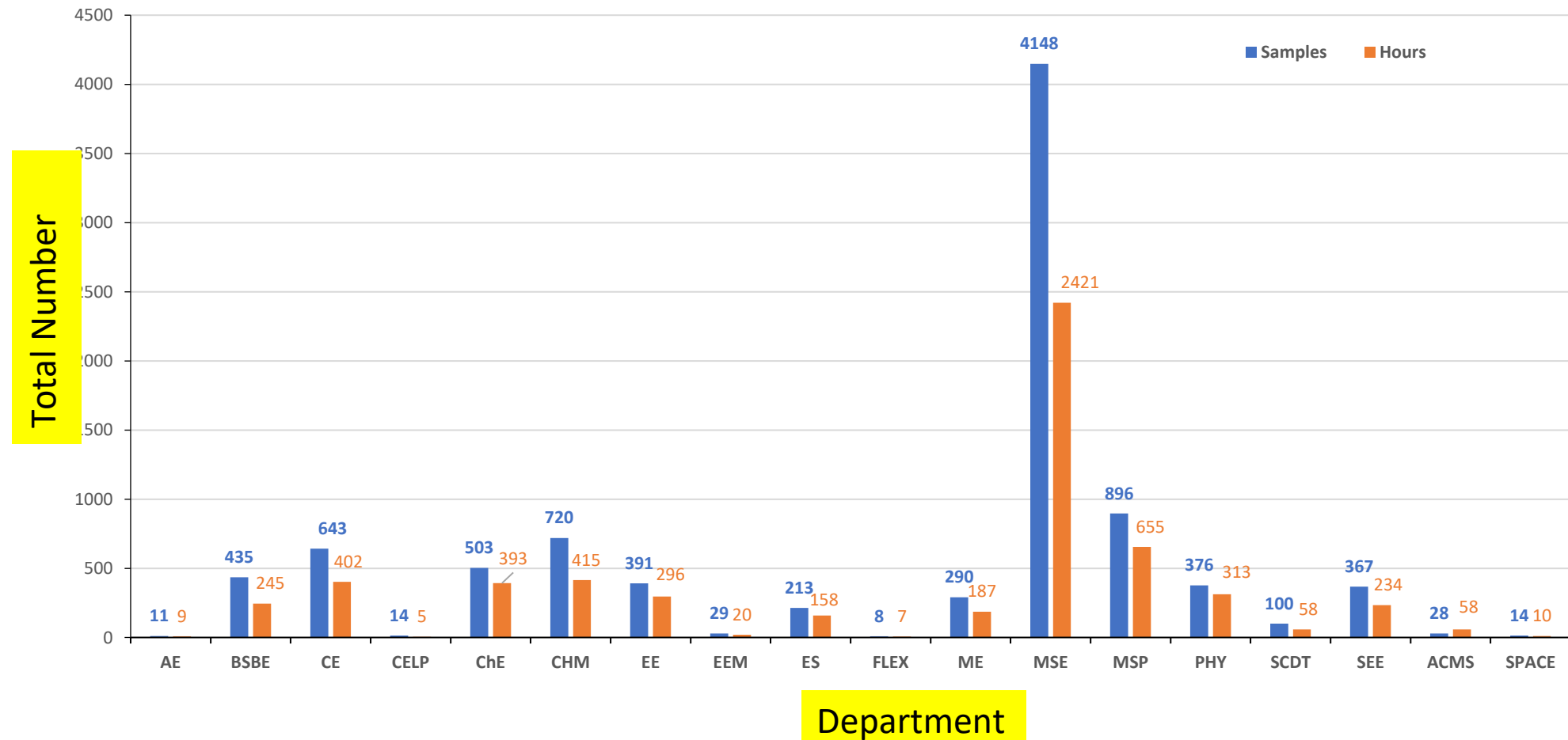
Total No. of operational hours- 15585



Rigaku MiniFlex 600 Usage from 2014 to July 2026

Total No. of samples analyzed- 9186

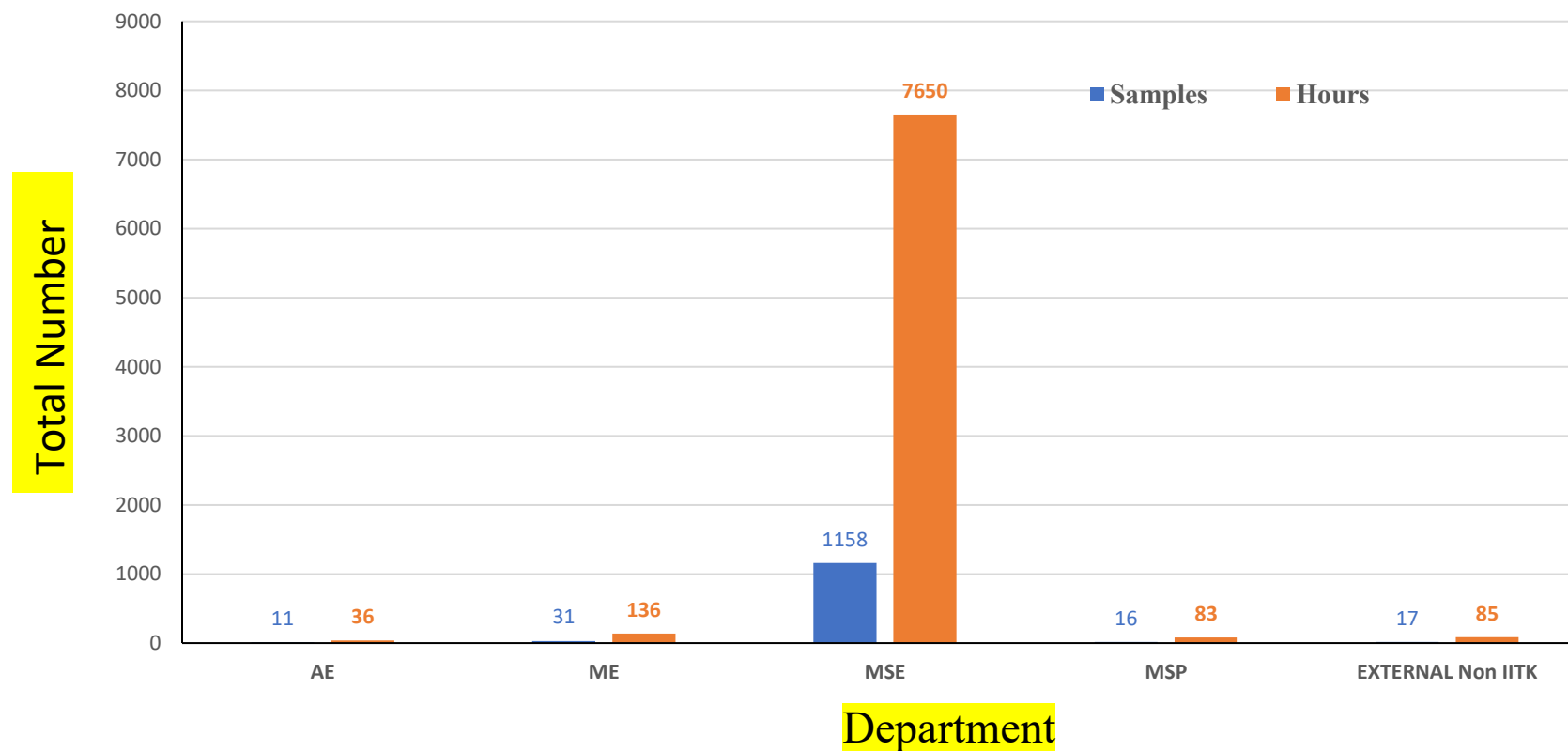
Total No. of operational hours- 5886



Rigaku Ultima Usage from 2014 to July 2026

Total No. of samples analyzed- 1233

Total No. of operational hours- 7990



Department wise Facility Utilization

PANaltical X'Pert usage
from 2014 to July 2026

Department	Samples	Hours
AE	26	16
BSBE	285	163
CE	1420	893
CESE	47	31
ChE	1573	1058
CHM	1650	976
EE	117	66
ES	450	275
FLEXE	12	9
ME	794	496
MSE	8558	6894
MSP	1398	969
PHY	295	244
SCDT	141	74
SEE	184	101
ACMS	179	538
CNS	6	3
EXTERNAL	3569	2779

Rigaku MiniFlex Usage
from 2014 to July 2026

Department	Samples	Hours
AE	11	9
BSBE	435	245
CE	643	402
CELP	14	5
ChE	503	393
CHM	720	415
EE	391	296
EEM	29	20
ES	213	158
FLEXE	8	7
ME	290	187
MSE	4148	2421
MSP	896	655
PHY	376	313
SCDT	100	58
SEE	367	234
ACMS	28	58
SPACE	14	10

Rigaku Ultima Usage
from 2014 to July 2026

Department	Samples	Hours
AE	11	36
ME	31	136
MSE	1158	7650
MSP	16	83
EXTERNAL	17	85

Major External (non-IITK) Users

Academic Institutes

From CSIR and IISER

- CDRI, Lucknow
- CSIR, CIMAP, Lucknow
- CSIR, IITR, Lucknow
- CSIR-CEERI
- CSIR-CMERI
- IISER KOLKATA

From IITs and NITs

- IIT Delhi
- IIT Patna
- IIT(ISM) Dhanbad
- IIT Jodhpur
- RGPIT, Raebareli
- MNIT Jaipur

- MNNIT Allahabad
- NIT Agartala
- NIT Durgapur
- NIT Patna
- NIT Raipur
- NIT Rourkela
- NIT Surathkal
- NIT Warangal
- SVNIT Surat

From other Academic Institutes

- AMU, Aligarh
- HBTU Kanpur
- BBAU Lucknow
- BIET Jhansi

- CSJMU, Kanpur
- Bundelkhand University, Jhansi
- Integral University, Lucknow
- Thapar University, Patiala
- University of Delhi, Delhi
- VIT Vellore
- Vidyasagar E College, Kolkata
- GGS Indraprastha University Delhi
- Doon University, Dehradun
- TERI University, Delhi
- PTU, Punjab

- **AND MANY MORE...**

Industries & R&D Organisations

- DMSRDE, DRDO, Kanpur
- Johnson Matthey, Kanpur
- La Opala RG Ltd., Gujrat
- Bee Chems, Kanpur

- Archaeological Survey of India, Agra
- Archaeological Survey of India, Greater Noida
- MKU Ltd., Kanpur

Online booking facility and User Charges

For online booking and other specific details please go through following link

<http://www.iitk.ac.in/acms/XRDlab/panlyticalXRD/userxrd1.html>

Serial No.	Name of Test	User charges in INR		
		IIT K (as per slot)	non IIT K (as per sample)	
			Academia	Industry
1	Ambient Polycrystalline XRD on MiniFlex with 0D detector	100	200	600
2	Ambient polycrystalline XRD on X'Pert with 1D detector	300	300	1000
3	SAXS on X'Pert	300	1200	3000
4	Ambient Texture and Residual stress on Ultima	300	1200	3000
5	Ambient X-Ray reflectivity measurement on Ultima	300	1200	3000
6	Rocking curve on Ultima	300	1200	3000
7	Reciprocal space map on Ultima	300	1200	3000
8	High Temperature Diffraction and texture on X'Pert and Ultima	5000	8000	12000



Advanced Centre for Materials Science Indian Institute of Technology Kanpur

Usage Statistics and Fiscal Report Mechanical Testing Facility (MTL, Room # 104, ACMS)

Prof. Anish Upadhyaya
(*Head, ACMS*)

Prof. Sudhanshu Shekhar Singh
(*Faculty In-charge, MTL*)

Mr. Anoop Kumar Raut
(*Technical Superintendent, Staff-In-charge MTL*)

Mr. Pankaj Kumar
(*Jr. Technical Superintendent, Staff MTL*)

Summary of ACMS Mechanical Testing Lab (MTL)

- Total **7 different dedicated test facilities comprising 10 equipment** are installed in the Mechanical Testing Lab (MTL) at ACMS.
- MTL is equipped to perform more than **10 types of mechanical tests** and several non-conventional mechanical tests.
- Over **11,369 Samples** have been tested so far between 2014 to 2026 at MTL.
- Total **37,270 Hours** of equipment usage time utilized in conducting various Mechanical Tests.
- **42% of total users** are **External** (including National and Regional Academic Institutions ; R&D Organisation; and Industries).
- Faculty, Research Scholars and Students from **12 Departments and Centers at IIT Kanpur** have utilized MTL facilities since their installation in 2014.
- A total revenue (from internal & external users) of around **Rs 52.35 Lakh by MTL** till date. MTL has also contributed **Rs. 12.79 Lakhs to R&D** from the testing amount collected from External Users.
- The facility has operated in **self-sustained mode** and met **~60%** of its expenditures through LDA and balance **40%** from ACMS Budget. After taking into consideration, expenditures incurred for upgradation, maintainence and repairs, MTL **LDA has still has balance of Rs 19 Lakhs as on 29.07.2026.**

Major Facilities *under* ACMS Mechanical Testing Lab (MTL)

	Instrument Name	Manufacturer	Capacity	Mechanism	Additional Setup	Standard Testing	Year Procured
1	Instrumented Impact Tester	<i>Zwick-Roell</i>	<i>150 J</i>	<i>Motorized</i>	<i>LT Bath (-50° C)</i>	<i>Charpy Test</i>	2013
2	Instron-68TM (To replace Instron-1195)	<i>ITW-Instron</i>	<i>50 kN</i>	<i>Screw Driven</i>	-	<i>Tensile, Compression, Flexural, Slow Cyclic</i>	2025 (2014)
3	MTS-810 UTM [Retrofitted]	<i>ITW-Instron</i>	<i>100 kN</i>	<i>Servo Hydraulic</i>	<i>Furnace</i>	<i>RT & HT Fatigue</i>	2014
4	UTM-100kN (Upgrade 100kN)	<i>ITW-BISS</i>	<i>100 kN</i>	<i>Servo Hydraulic</i>	<i>Low Temp Chamber</i>	<i>Tensile, Fatigue & Fracture</i>	2026 (2014)
5	Creep Station (I & II)	<i>ITW-BISS</i>	<i>50 kN</i>	<i>Servo Electric</i>	<i>Furnace</i>	<i>Creep, HT Tensile & Compression</i>	2014
6	SSRT -Vertical SSRT-Horizontal	<i>ITW-BISS</i>	<i>50 kN</i>	<i>Servo Electric</i>	<i>Liquid Bath</i>	<i>Stress Corrosion</i>	2014
7	250kN UTM (Upgraded ATTS)	<i>ITW-BISS</i>	<i>250 kN,</i>	<i>Servo Hydraulic</i>	<i>Induction Heater</i>	<i>Axial Torsion</i>	2025 (2014)

Note: In FY2024-25, a new 50kN UTM replaced the retrofitted Instron-1195. Two UTM got upgraded which were UTM-100kN & UTM-250kN

Specifications of Instruments housed-in Mechanical Testing Lab

Instron 68TM



- ❑ Retrofit by ITW-Instron
- ❑ Screw-driven mechanism
- ❑ Max. Load Capacity: 50 kN
- ❑ Min Load Capacity : 1N
- ❑ Test Types: Tensile, Compression, Bend, Flexural
- ❑ Crosshead Speed: (Max) 40 mm/min, (Min) 0.005 mm/min
- ❑ Crosshead Displacement: 700 mm

100kN UTM



- ❑ Manufactured by ITW-BISS India
- ❑ Servo-Hydraulic Actuator
- ❑ Max. Load Capacity: 100 kN
- ❑ Min Load Capacity: 100 N
- ❑ Test Types: Tensile, Compression, Fatigue, Flexural, Cyclic, FCP & J1C/K1C
- ❑ Crosshead Speed: (Max) 60 mm/min, (Min) 0.001 mm/min
- ❑ Crosshead Displacement: +/- 80 mm

Creep Station (I & II)



- ❑ Manufactured by ITW-BISS India
- ❑ Servo-Electric Actuator
- ❑ Max. Load Capacity: 50 kN
- ❑ Min Load Capacity: 5 N
- ❑ Test Types: Creep, HT Tensile and RT & HT Compression
- ❑ Crosshead Speed: (Max) 40 mm/min, (Min) 0.0001 mm/min
- ❑ Crosshead Displacement: +/- 80 mm

to be contd..

250kN UTM (ATTS)



- ☐ By ITW-Instron India
- ☐ Servo-Hydraulic Actuator
- ☐ Max. Load Capacity: 250 kN
- ☐ Min. Load Capacity: 250 N
- ☐ Test Types: Tensile, High & Low Fatigue
- ☐ Crosshead Speed: (Max) 60 mm/min, (Min) 0.001 mm/min
- ☐ Crosshead Disp: +/- 80 mm

MTS 810 (Retrofitted)



- ☐ Retrofit by ITW-BISS India
- ☐ Servo-Hydraulic Actuator
- ☐ Max. Load Capacity: 100 kN
- ☐ Min Load Capacity : 100 N
- ☐ Test Types: Tensile, RT & HT Fatigue
- ☐ Crosshead Speed: 0.001 to 60 mm/min
- ☐ Crosshead Disp: +/- 80 mm

SSRT (Vertical & Horizontal)



- ☐ By ITW-BISS India
- ☐ Servo-Electric Actuator
- ☐ Max. Load Capacity: 50 kN
- ☐ Min Load Capacity: 5 N
- ☐ Test Types: Tensile with corrosion (in solution)
- ☐ Crosshead Speed: Max: $100^2/s$; Min: $10^{-7}/s$
- ☐ Crosshead Displacement: +/- 80 mm

Instrumented Impact Tester



- ☐ By Zwick-Roell
- ☐ Motorized Hammer & Instrumented Data Acquisition
- ☐ Max. Capacity: 150 / 300 Joules
- ☐ Min Load Capacity: 1 Joules
- ☐ Test Types: Charpy, LT Charpy (-50 deg C)
- ☐ Hammer Speed: 5 mm/s

Yearly Summary Table of **Number of Samples Tested by Each Instrument**

	<i>Number of Samples Tested by Specific Instrument</i>									
Fiscal Year	Axial Torsion/250 KN UTM	BISS UTM-100KN	Creep Station	Inst. Impact Tester	Instron -1195	MTS -810	SSRT -Horizontal	SSRT -Vertical	INSTRON 68TM-50	Grand Total
2014 - 2015	-	294	2	-	225	40	-	-	-	561
2015 - 2016	7	195	42	18	326	10	19	47	-	664
2016 - 2017	12	170	20	46	573	0	12	28	-	861
2017 - 2018	18	130	8	12	795	27	15	23	-	1028
2018 - 2019	53	116	2	33	861	158	-	298	-	1521
2019 - 2020	34	279	41	89	739	81	7	120	-	1390
2020 - 2021	63	84	9	16	537	0	*	93	-	802
2021 - 2022	42	157	64	105	862	*	1	50	-	1281
2022 - 2023	*	158	10	30	849	*	*	8	-	1055
2023 - 2024	*	327	155	55	341	*	*	6	-	884
2024 - 2025	*	90	84	65	111	*	*	11	-	361
2025-2026	1	264	189	128	91	*	*	2	276	951
Total	357	2085	720	646	6325	316	54	686	276	11359

* instrument was down during this period.

Total 11,359 Samples analysed at Mechanical Testing Lab in ACMS-Mechanical Testing Lab since 2014

Yearly Summary Table of Usage Time (Hours) by Each Instrument

	<i>Number of Usage Time (Hours) by Specific Instrument</i>									
Fiscal Year	Axial Torsion/UT M 250 kN	BISS UTM- 100KN	Creep Station 1 & 2	Instrumented Impact Tester	Instron - 1195	MTS -810	SSRT - Horizontal	SSRT - Vertical	INSTRON 68TM-50	Grand Total
2014 - 2015	-	294	2	-	225	40	-	-	-	561
2015 - 2016	7	634	42	6	326	15	1532	2084	-	4646
2016 - 2017	16	580	536	6	610	0	112	241	-	2101
2017 - 2018	19	613	1142	3	819	29	1217	23	-	3865
2018 - 2019	53	1189	2	33	861	155	-	396	-	2689
2019 - 2020	34	989	77	89	817	193	46	1892	-	4137
2020 - 2021	142	579	127	16	555	0	*	1396	-	2815
2021 - 2022	1311	2381	64	105	1046	*	60	2650	-	7617
2022 - 2023	*	974	10	30	1005	*	*	244	-	2263
2023 - 2024	*	2418	155	55	341	*	*	183	-	3152
2024 - 2025	*	185	84	65	80	*	*	188	-	656
2025 - 2026	12	1804	519	64	91	*	*	2	276	2768
Total	1688	12766	3233	497	6835	432	2967	9299	276	37270

* instrument was down during this period.

Total 37,270 Hours of Operation on various instruments in MTL since 2014.

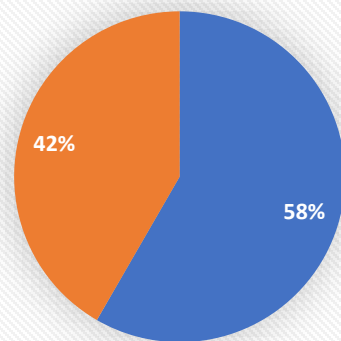
Usage Statistics of MTL Instruments by **IITK (Internal)** and **Non-IITK (External)** Users

Fiscal Yr	IITK Users		External Users	
	Samples	Hours	Samples	Hours
2014 - 2015	435	435	126	126
2015 - 2016	553	4542	111	104
2016 - 2017	525	1592	336	509
2017 - 2018	534	3196	494	669
2018 - 2019	758	1845	763	844
2019 - 2020	748	2688	642	1449
2020 - 2021	451	1819	351	996
2021 - 2022	844	2804	437	4813
2022 - 2023	577	1504	478	759
2023 - 2024	468	1892	416	1260
2024 - 2025	235	258	126	398
2025 - 2026	509	1296	461	1671
Total	6637 <i>Samples</i> (IITK)	23871 <i>hrs</i> (IITK)	4741 <i>samples</i> (Ext)	13598 <i>hrs</i> (Ext)

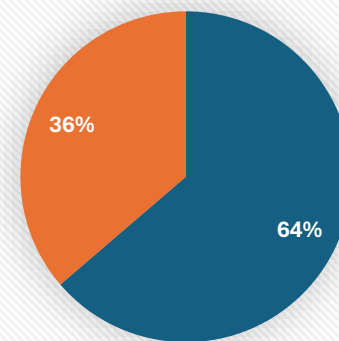
Total Number of Samples Tested: 11,378

Total Usage Time: 37,469 hrs

NO. OF SPECIMENS



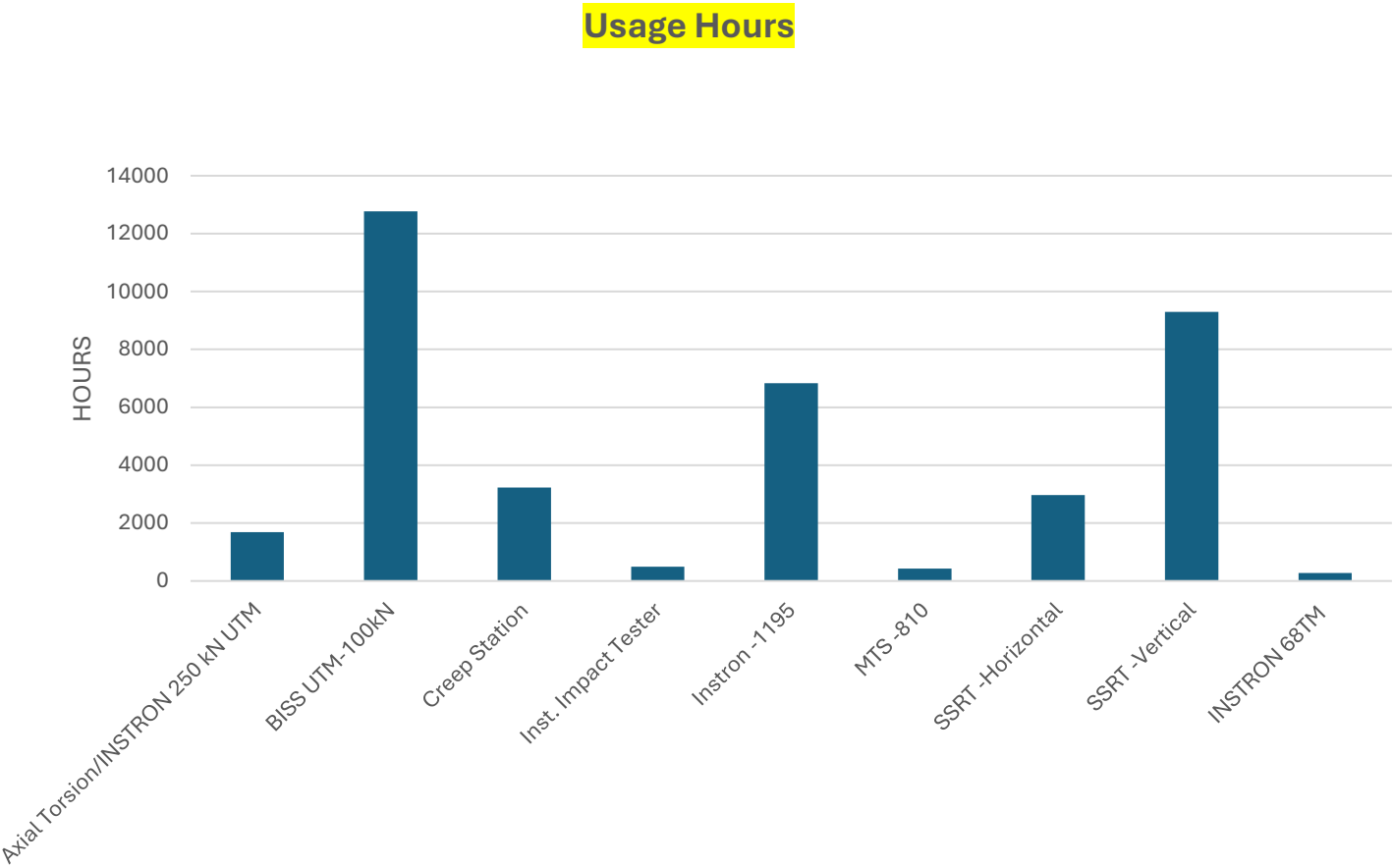
USAGE HOURS



- Total **11,378 Samples** so far tested in MTL in over **37,469 hrs** of usage of facilities.
- Out of total overall usage, **42% of samples** and **36% of usage time** is by **External Users**

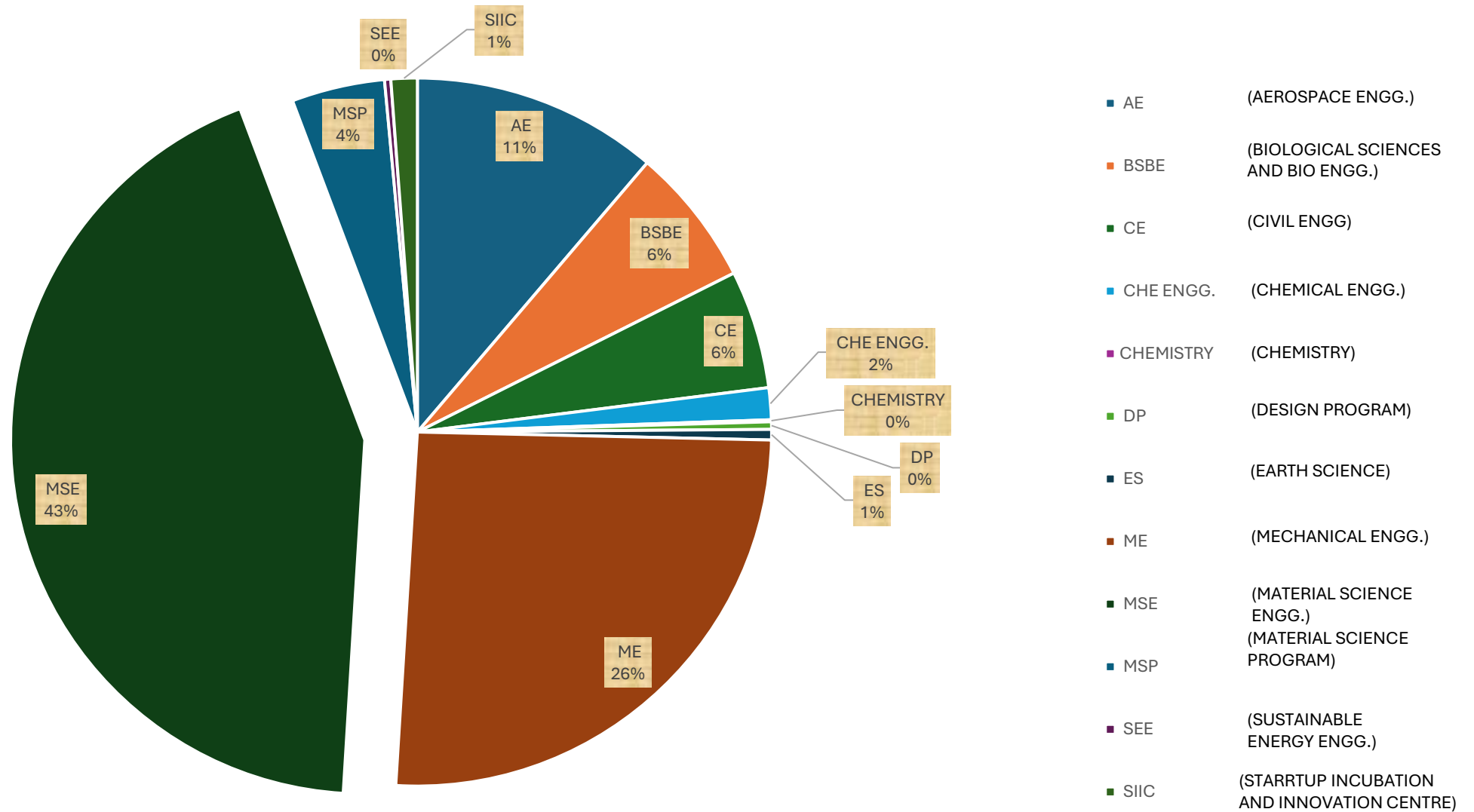
Graphical presentation of Total Usage of Instruments by Operational Hours

Instrument	Usage Hours
Axial Torsion/INSTRON 250 kN UTM	1688
BISS UTM-100kN	12776
Creep Station	3233
Inst. Impact Tester	497
Instron -1195	6835
MTS -810	432
SSRT -Horizontal	2967
SSRT -Vertical	9299
INSTRON 68TM	276
Grand Total	38003



Usage Statistics of MTL Instruments **Within IITK** by various Departments and Centers

Deptt.	Samples
AE	751
BSBE	424
CE	361
CHE ENGG.	97
CHEMISTRY	6
DP	23
ES	32
ME	1711
MSE	2892
MSP	284
SEE	19
SIIC	80
Grand Total	6680

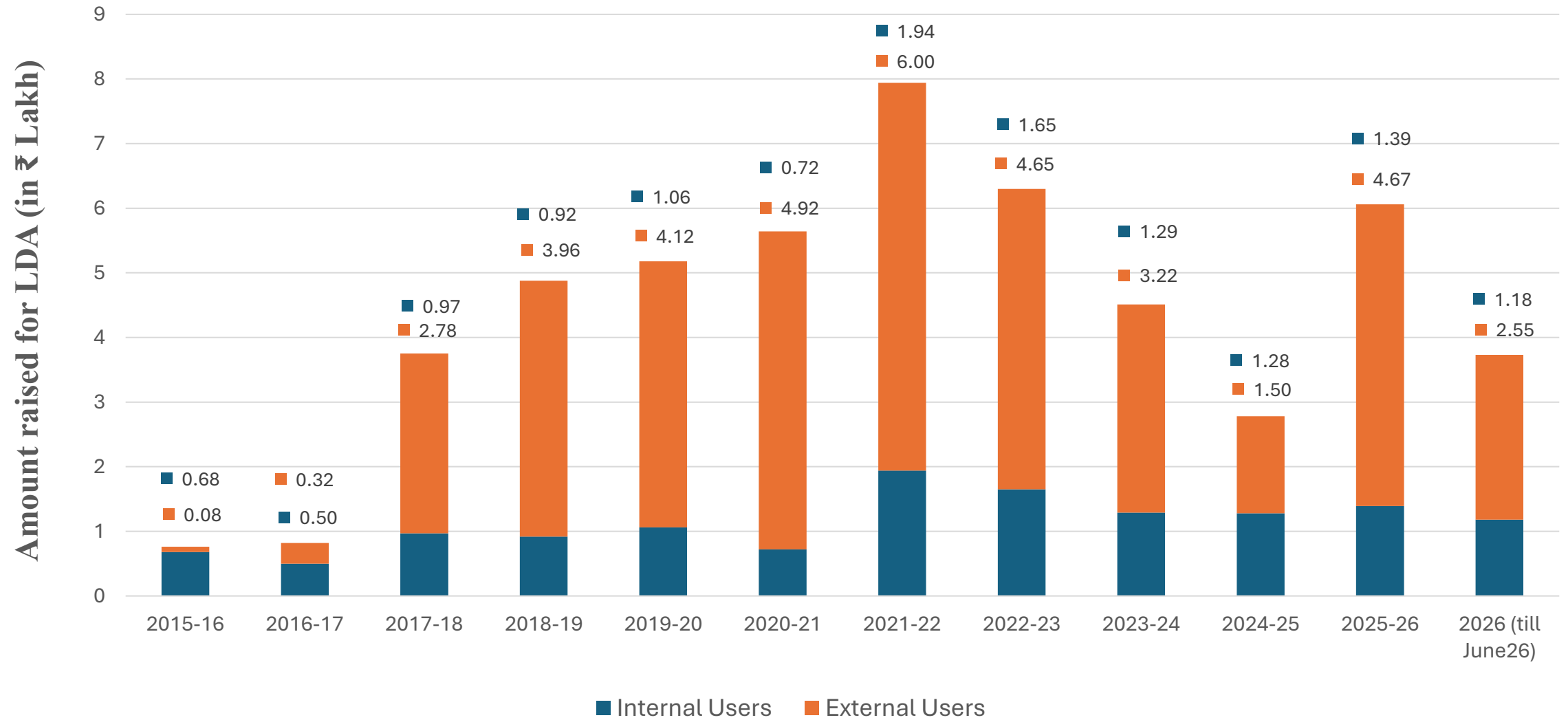


Revenue Generated from IITK (Internal) and Non-IITK (External) Users

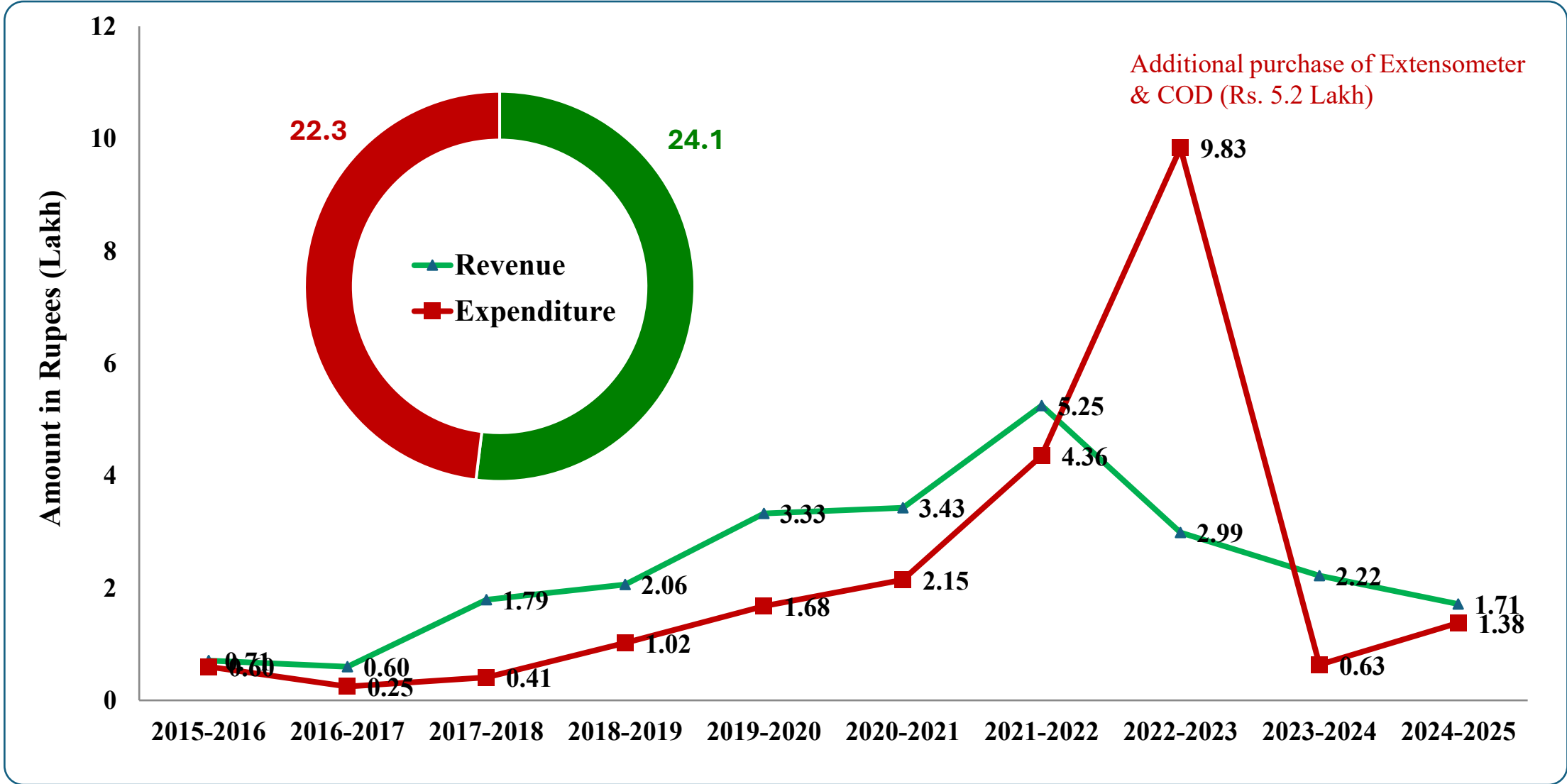
<i>Revenue Generated Through User Charges (in ₹ Lakh)</i>			
	Internal Users	External Users	
Fiscal Year	IITK Users to LDA	Testing Amount	Shared with R&D
2015-2016	0.68	0.08	0.03
2016-2017	0.50	0.32	0.11
2017-2018	0.97	2.78	0.92
2018-2019	0.92	3.96	1.31
2019-2020	1.06	4.12	1.36
2020-2021	0.72	4.92	1.62
2021-2022	1.94	6.00	1.98
2022-2023	1.65	4.65	1.53
2023-2024	1.29	3.22	1.06
2024-2025	1.28	1.50	0.50
2025-2026	1.39	4.67	1.54
2026 (till now)	1.18	2.55	0.84
Total	₹ 13.58	₹ 38.77	₹ 12.79

Since 2015 a total revenue of around ₹ 52.35 Lakhs towards Lab Development Account (LDA) has been generated from the testing fee collected from internal and external facility users, out of which around *Rs. 12.8 Lakh is shared with DoRD towards DoRD establishment.*

Revenue Generated from IITK (Internal) and Non-IITK (External) Users



Revenue Generated (from User Charges) versus Expenditure (in Maintenance and Repair)



The up-rising maintenance costs and the obsolescence of controller systems, rendering them unrepairable, pose significant challenges for the laboratory. The manufacturer has recommended upgrading the controller systems of each UTM unit to address these concerns.

Testing Charges for Facilities Housed in Mechanical Testing Lab at ACMS

	Mechanical Tests	Rates for IITK Users	Rates for External Users	
			(for Academia)	(for Industry)
1	Room Temperature tension/ torsion/ compression	Rs 200/sample (No charge for 1 sample)	Rs 400/sample	Rs 1000/sample
2	High Temp Tests (from RT to 500C)	Additional Rs. 200/hour	Additional Rs. 400/hour	Additional Rs. 2000
3	High Temp Tests (above 500C)	Additional charge of Rs. 400 per hour	Additional charge of Rs. 800 per hour	Additional charge of Rs. 4000
4	Fatigue Tests (10 Hz or higher)	Rs 7500 for S-N curve (first 5 samples) Rs. 2000 each additional sample	Rs 15,000 for S-N curve (5 samples) Rs. 4000 each additional sample	Rs 75,000 for S-N curve (5 samples) Rs. 20,000 each additional sample
5	Fracture Toughness J1C/ K1C (CTOD)	Rs 400 + Rs 100	Rs 800 + Rs 200	Rs 5000 + Rs. 1000
6	Fracture Toughness J1C/ K1C (cyclic loading)	Rs 400/sample + Rs. 250 per hour of cyclic loading	Rs 800/sample + Rs. 500 per hour of cyclic loading	Rs 4000 per sample + Rs. 2500 per hour of cyclic loading
7	Tests with DIC	Additional charge of Rs. 1000 per slot (upto 5 samples)	Not Available	Not Available
8	Creep Tests	Rs. 1200 per sample (upto 48 hours) Rs. 600 for each additional day (24hr) or part thereof	Rs. 2400 per sample (upto 48 hours) Rs. 1200 for each additional day (24hr) or part thereof	Rs. 12,000 per sample (upto 48 hours) Rs. 6000 for each additional day (24hr) or part thereof
9	SSRT Tests	Rs. 1200 per sample (upto 48 hours) Rs. 600 each additional day (24hr)	Rs. 2400/sample (upto 48 hours) Rs. 1200 each additional day (24h)	Rs. 12,000/sample (upto 48 hours) Rs. 6000 each additional day (24hr)
10	Impact (Charpy) Test	Rs. 100/sample at RT and cryo	Rs. 200/sample at RT and cryo	Rs. 1000/sample at RT and cryo

Key External Users of MTL Facility at ACMS from Academia, R&D organizations and Industries

Academic Institutes

- MNIT Allahabad
- DEI Dayalbagh
- MMMUT Gorakhpur
- MANIT Bhopal
- JSSATE
- HBTU
- NIT Jalandhar
- NIT Agartala
- IITDM Jabalpur
- IIT Patna
- IIITDM Jabalpur
- NIET Noida
- IIT-KGP
- BIET Jhansi
- Axis College Kanpur
- Rewa Engineering College
- MPEC Kanpur
- NIT Rourkela
- NIT DURGAPUR
- IIT BHU
- Chennai University
- AKTU (CAS) Lucknow
- VNIT Nagpur
- SHUATS
- NIT-Durgapur
- NIET Greater Noida
- Maharana Pratap Kanpur
- DATID KANPUR
- D Y Patil Institute
- CBIR
- BBAU
- Annamalai Chennai
- SPPGIDMS Lucknow
- Rama Dental College
- NIT Manipur
- NIT HAMIRPUR , HP
- NIT Bhopal
- King George's Medical University
- IVRI Bareilly
- IIT D
- IIT D
- IET Agra
- CSJMU
- CET, Trivandrum
- CAMBRIDGE INSTITUTE OF TECHNOLOGY, RANCHI
- Allen Institute
- **AND MANY MORE...**

Industries & R&D Organisations

- Camio Industries Pvt. Ltd.
- CBRI Roorkee
- DMSRDE Pune
- IAF Station Kanpur
- Jindal Stainless, Hisar
- Vardhaman Special steels Ltd.
- Leviat Ltd., Gujrat
- Namami Industries., Gujrat
- Rites Ltd
- SCT IMST Kerala
- Unimax International
- **AND MANY MORE...**

Annexure VI



Advanced Centre for Materials Science Indian Institute of Technology Kanpur

Usage Statistics and Yearly Status Report **Optical Profilometer Facility** (Room # 110, ACMS)

Dr. Anish Upadhyaya
(*Head, ACMS*)

Dr. Kantesh Balani
(*Faculty In-charge, OPF*)

Mr. Rupesh Kumar Sharma
(*Sr. Technician, Staff In-Charge*)

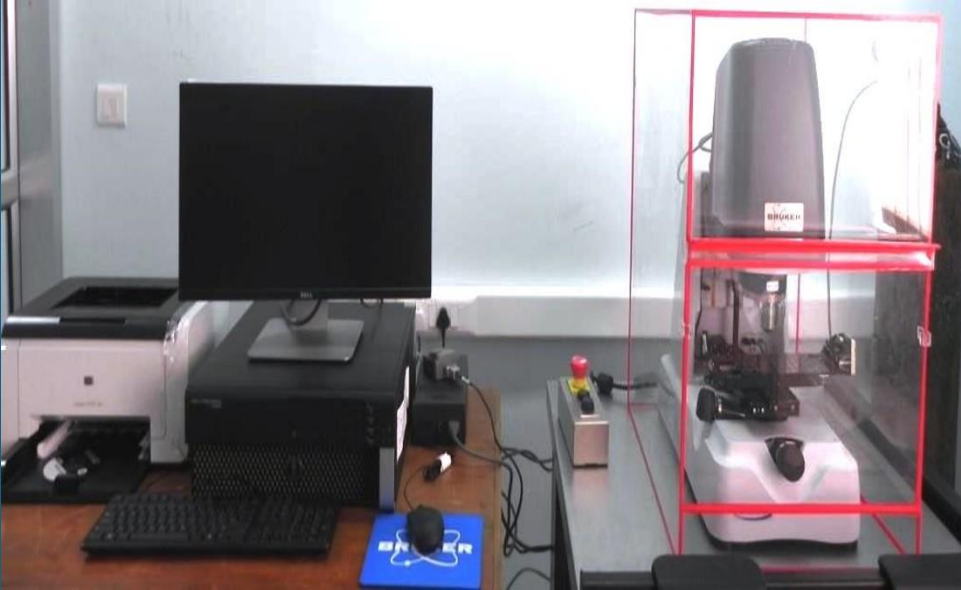
Mr. Puneet Kumar
(*Jr. Technician*)

Summary Outlines of Optical Profilometer Lab

- Optical Profilometers are interference microscopes and are used to measure height variations such as roughness on surfaces with great precision using the wavelength of light as the ruler.
- Over **5642 Samples** have been tested so far between 2015 to June 2026 with OP Facility.
- Total **3319 Hours** of facility usage time utilized in conducting Surface Characterization Tests.
- **13% of total users** are **External** (including National and Regional Academic Institutions ; R&D Organisation; and Industries).
- Faculty, Research Scholars and Students from **15 Departments and Centers at IIT Kanpur** have utilized OP facilities since their installation in 2015.
- A total revenue of around **Rs 4.8 Lakh generated and contributed to LDA of OP Facility** till date. OP has also contributed **Rs. 74 Thousand to R&D** from the testing amount collected from External Users.
- The facility has operated in self-sustained mode and met ~47% of its expenditures through LDA and balance 53% from ACMS Budget. After taking into consideration, expenditures incurred for upgradation, maintenance and repairs, OP facility current LDA (2025006) has balance of **Rs 77.7 Thousand as on 30.06.2026**.
- Since its inception, OP Facility at ACMS has not sought any special Grant / Funds from Institute.

Specifications of Instrument

Optical Profilometer Contour GT-K



- ☐ Manufactured by Bruker AXE PTE Ltd Singapore
- ☐ Vertical Resolution: $< 0.01\text{nm}$
- ☐ Max. Scan Speed: $47\mu\text{m/s}$
- ☐ Step Height Accuracy: $< 0.75\%$
- ☐ Objectives: 2.5X, 20X, 50X
- ☐ Max. Scan Range: Up to 3mm (Min) 0.005 mm/min
- ☐ Tip/Tilt Function: $\pm 6^\circ$ manual in stage
- ☐ Sample Height: Up to 100mm (4inch)

Instrument	Maker	P.O. Number	Dated	Total Cost (USD)
Advance Automation System Optical Non-Contact Profilometer Contour GT-K	Bruker AXE PTE Ltd Singapore	NC-2755	28-02-2014	USD71791 ~4479758 (INR)

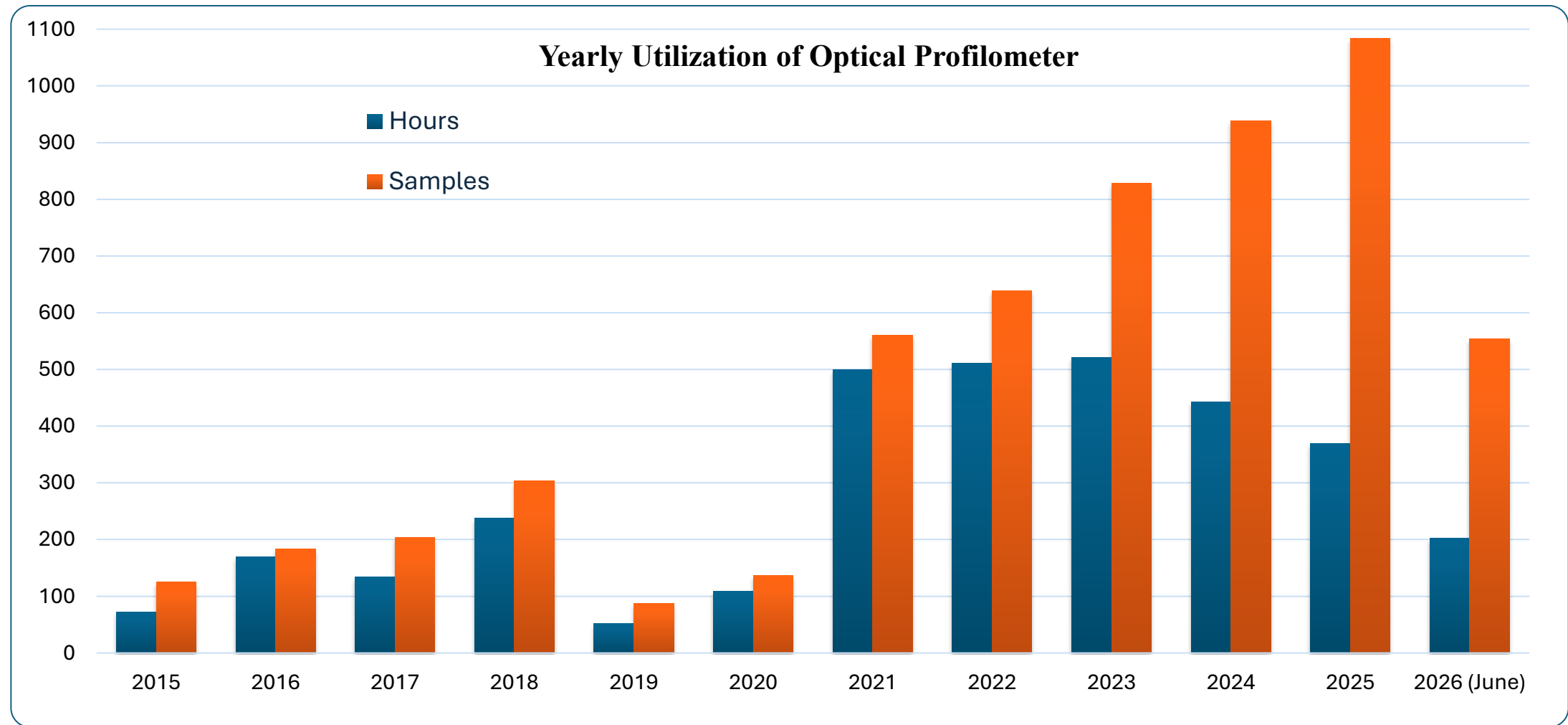
Yearly Summary Table of Number of Samples Tested by Optical Profilometer Facility

Year	Number of Samples Tested
2015	125
2016	183
2017	204
2018	303
2019	87
2020	137
2021	560
2022	639
2023	828
2024	938
2025	1084
2026 (June)	554
TOTAL	5642

Yearly Summary Table of Usage Time (Hours) by Optical Profilometer Facility

Year	Number of Usage Time (Hours)
2015	72.5
2016	169
2017	134
2018	238.25
2019	51.5
2020	108.5
2021	499
2022	510.5
2023	521.5
2024	442.5
2025	369.4
2026 (June)	202.5
TOTAL	3319.15

Year-to-Year Usage of Instruments *vis a vis* Number of Samples and Usage Time

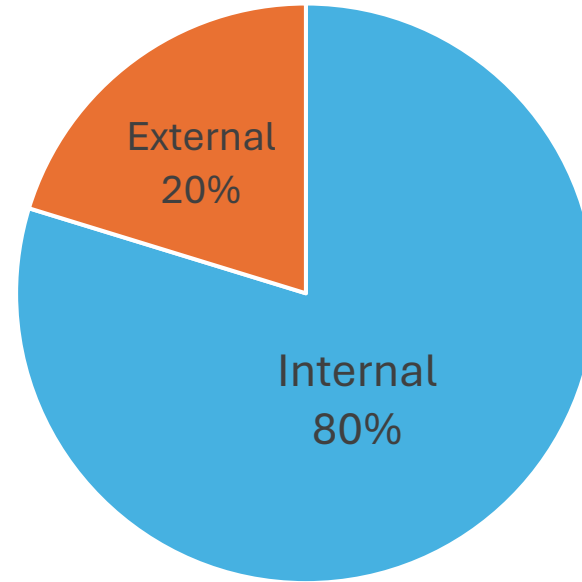


Total 5642 Samples with usage hours of **3319** tested at Optical Profilometer Facility in ACMS since 2015

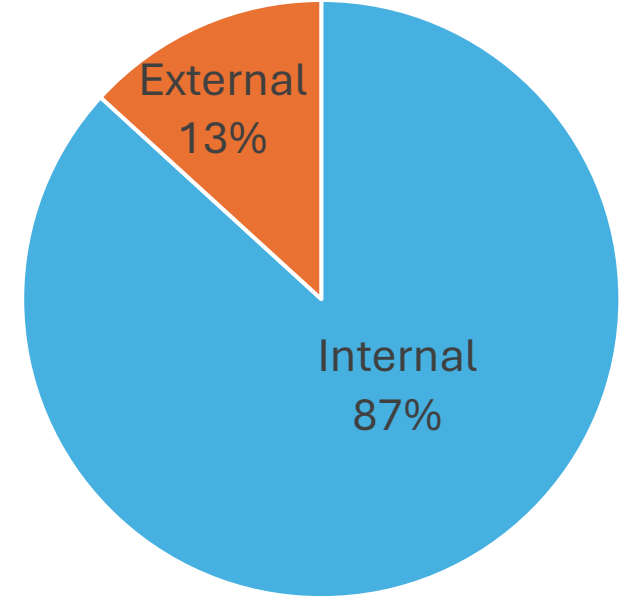
Usage Statistics by IITK (Internal) and Non-IITK (External) Users

Year	External		Internal	
	Samples	Hours	samples	Hours
2015	15	8.75	110	63.75
2016	53	17.75	130	151.25
2017	75	28.75	129	105.25
2018	22	7.5	281	230.75
2019	22	6.75	65	44.75
2020	19	12.25	118	96.25
2021	44	27.5	516	471.5
2022	35	23.75	604	486.75
2023	199	93	629	428.5
2024	208	79.5	730	363
2025	287	87.9	797	281.5
2026 (June)	164	45.25	390	157.25
TOTAL	1143	438.65	4499	2880.5

Total Number of Samples Tested: 5642



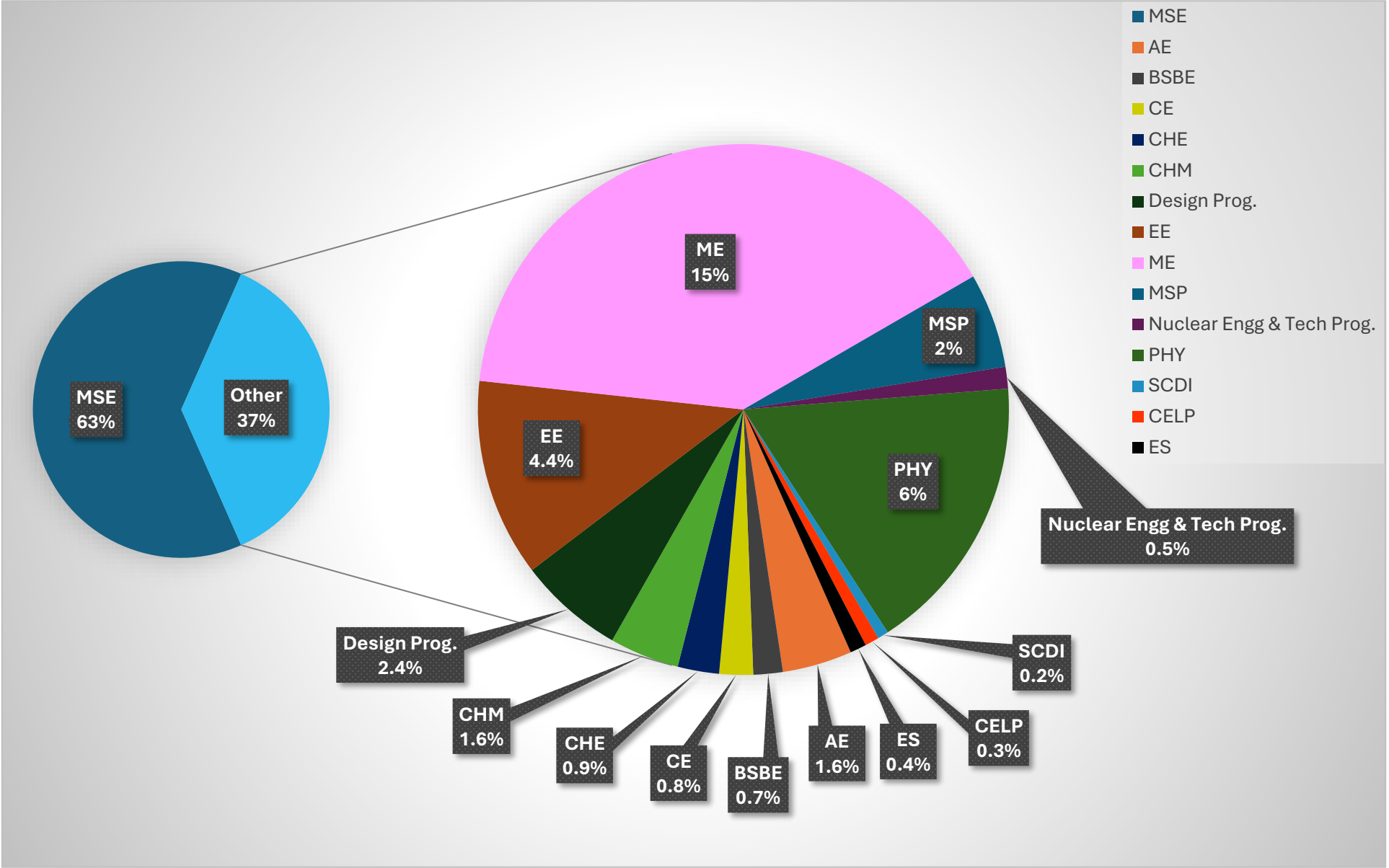
Total Usage Time: 3319.15 hrs



- Total **5642 Samples** so far tested in OPF in over **3319.15 hrs** of usage of facilities.
- Out of total overall usage, **20% of samples** and **13% of usage time** is by **External Users**

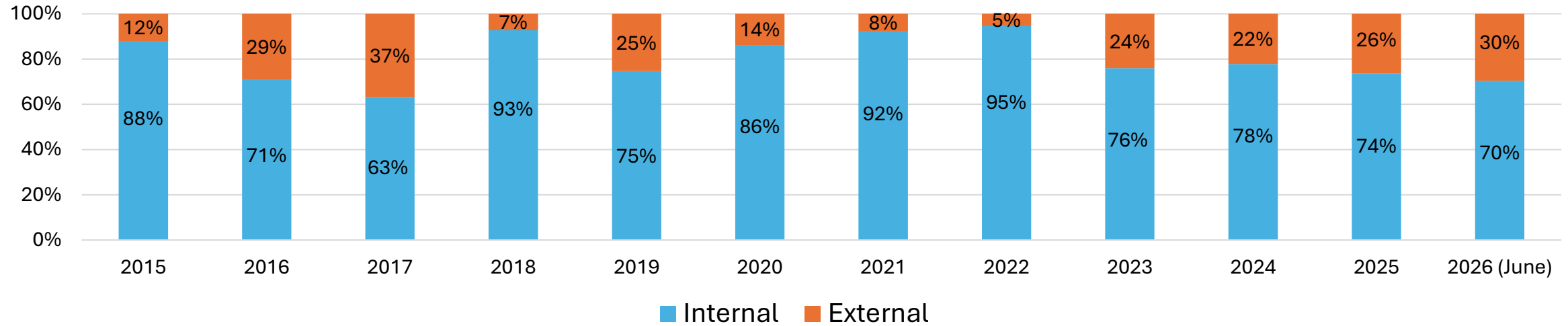
Usage Statistics **Within IITK** by various Departments and Centers

Dept.	Samples	Usage %
MSE	2596	63%
AE	64	1.6%
BSBE	27	0.7%
CE	31	0.8%
CHE	38	0.9%
CHM	64	1.6%
Design Prog.	97	2.4%
EE	182	4.4%
ME	602	15%
MSP	87	2%
Nuclear Engg & Tech Prog.	20	0.5%
PHY	258	6.3%
SCDI	10	0.2%
CELP	13	0.3%
ES	15	0.4%

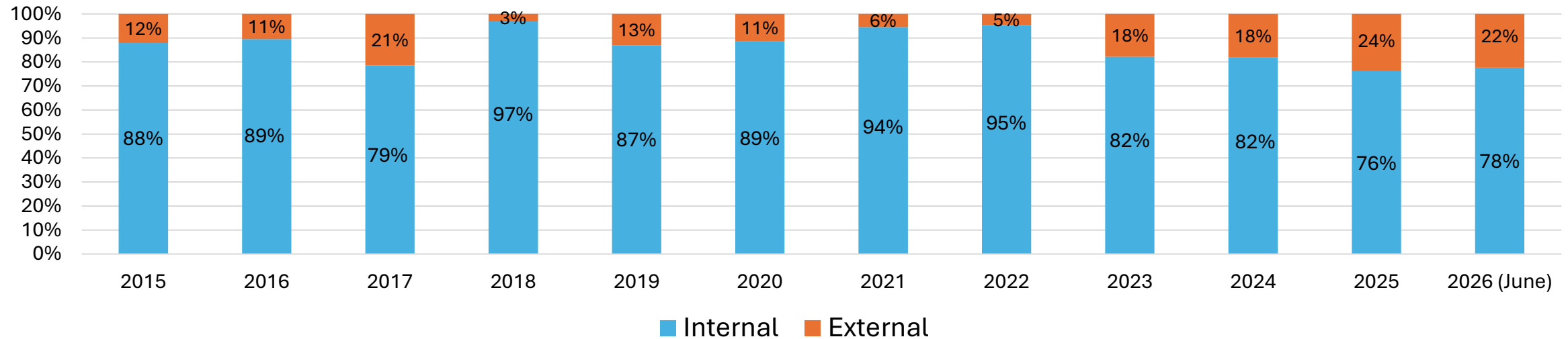


Usage Statistics by **IITK (Internal)** and **Non-IITK (External)** Users

%age Share of Overall Samples Tested by IITK vs External Users



%age Share of Overall Usage Time from IITK vs External Users



Testing Charges for Facility at ACMS

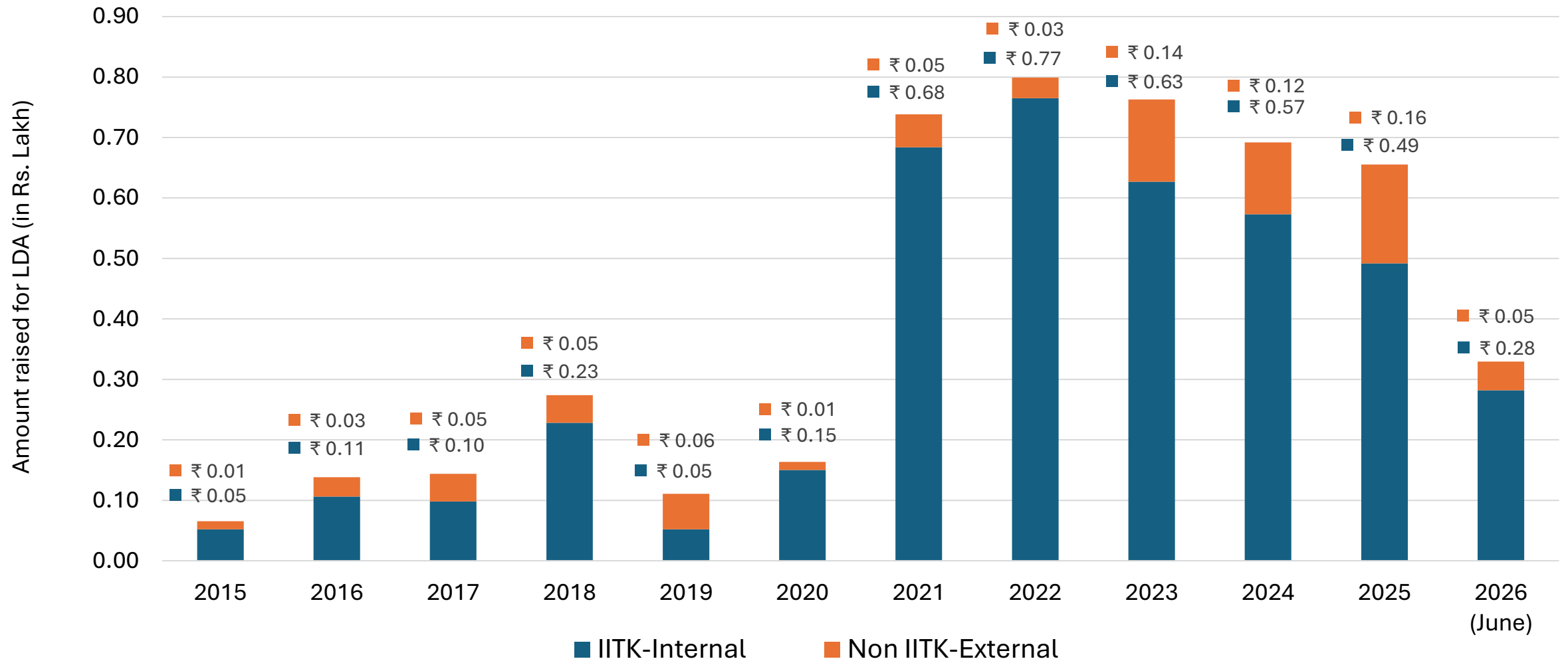
Name of Facility	Rates for IITK Users	Rates for External Users			Slot duration
		For Academia	National Labs	Industries and Private labs	
OPTICAL PROFILOMETER Bruker Contour GT-K	Rs.300/Slot	Rs.1000/Slot	Rs.1500/Slot	Rs.3000/Slot	2Hrs
		+ 18% (G.S.T)	+ 18% (G.S.T)	+ 18% (G.S.T)	

Revenue Generated from **IITK (Internal) and Non-IITK (External) Users**

Revenue Generated Through User Charges (In Lakh Rs)					
Year	Internal Users	External Users			Total Revenue (towards LDA)
	IITK Users to LDA	Testing Amount (excl. Tax)	Transfer to LDA	Shared with R&D	
2015	0.052	0.039	0.013	0.013	0.06
2016	0.106	0.095	0.032	0.031	0.14
2017	0.098	0.135	0.046	0.045	0.14
2018	0.228	0.135	0.046	0.045	0.27
2019	0.052	0.173	0.059	0.057	0.11
2020	0.150	0.040	0.014	0.013	0.16
2021	0.684	0.160	0.054	0.053	0.73
2022	0.765	0.100	0.034	0.033	0.79
2023	0.627	0.400	0.136	0.132	0.76
2024	0.573	0.350	0.119	0.116	0.69
2025	0.492	0.480	0.163	0.158	0.65
2026 (June)	0.282	0.140	0.048	0.046	0.33
Total	4.109	2.247	0.764	0.741	4.8

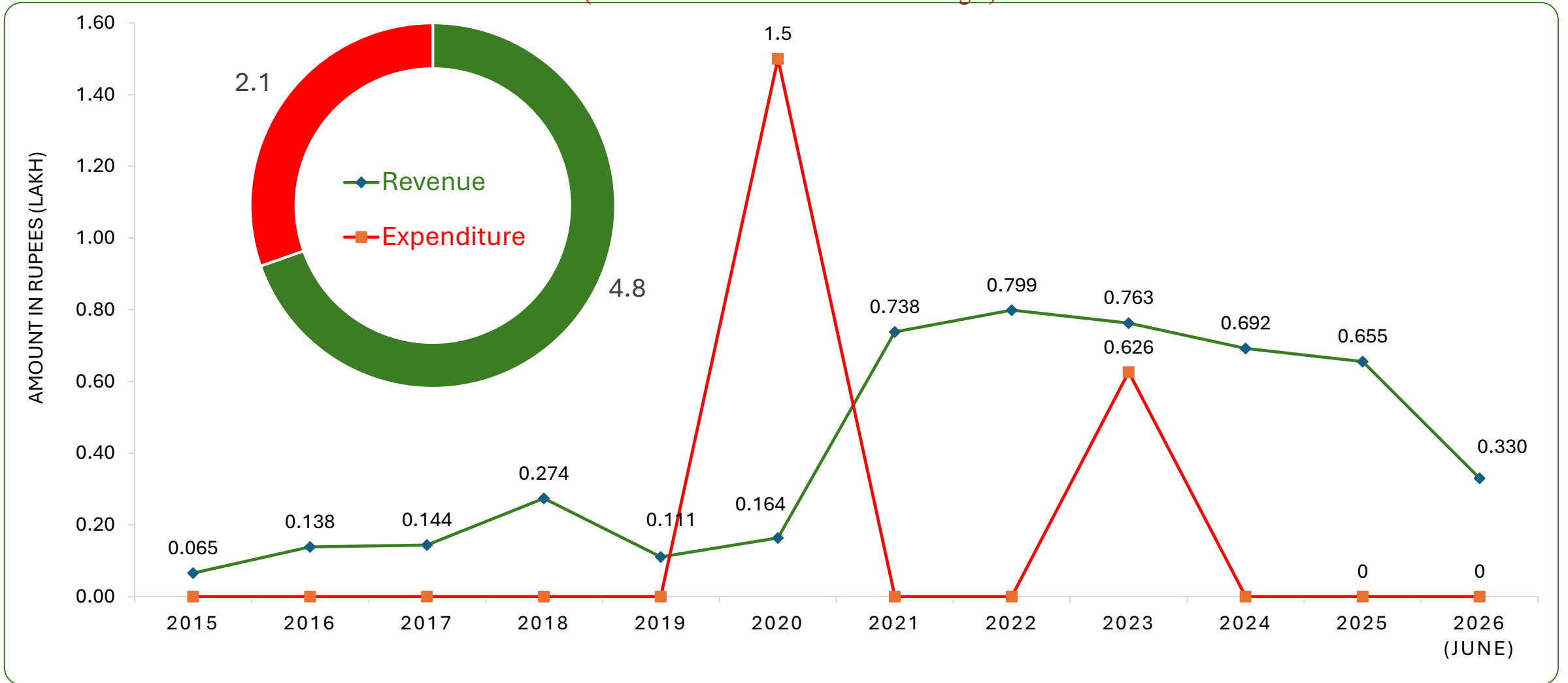
Since 2015 a total revenue of around Rs. 4.8 Lakhs towards Lab Development Account (LDA) has been generated. Around Rs. 74 thousand is shared with R&D from the testing fee collected from External Users.

Revenue Generated (in Lakh) from IITK (Internal) and Non-IITK (External) Users



Revenue Generated (from User Charges) versus Expenditure (in Maintenance and Repair)

Purchasing of 2.5X Objective of Rs.4.5 lakh
(Rs. 1.5 lakh from LDA & ACMS budget)



Lab & Maintenance Expenditure of Optical Profilometer Facility in ACMS

Fiscal Year	Description	From LDA	From ACMS budget	Institute Special Grant
2015	-	-	-	-
2016-2017	-	-	-	-
2017-2018	-	-	-	-
2018-2019	-	-	-	-
2019-2020	-	-	-	-
2020-2021	2.5X Interferometric Objective		-	-
2021-2022	-	100000	50000	-
2022-2023	-	-	-	-
2023-2024	Desktop PC	-	-	-
	Computer Table	-	55449	-
2024-2025	-	-	7200	-
2025-2026		-	-	-
2026-2027	-	-	-	-
Total		100000	112649	Nil

****2.5X objective costed 4.5L , 1.5L is expended by LDA & ACMS budget where as remaining 3L amount is provided by different projects of faculty convenors associated with ACMS.**

- Since installation (2014-15) to till date so far Rs 2.12 Lakhs has been spent for OP facility upkeep. out of which Rs **1 Lakh (47% of total) is from Lab Development Account (LDA-IITK-ACMS-2023696)** which has been sustained through User Charges. The remainder part of Maintenance Expenses for OP facilities **Rs 1.12 Lakhs (53% of total) was through ACMS Budget.**
- OP facility at ACMS so far **has not sought any Institute Grant / Special Grant.**
- **Till date, the LDA of OP Facility has generated Rs 4.8 Lakhs. After taking into consideration maintenance and repair expenses of facilities and contribution to R&D account, as on 30 June 2026, LDA of IL & OP Facility @ ACMS has Rs 17.12 Lakh!**

Key External Users of Optical Profilometer Facility at ACMS from Academia, R&D organizations and Industries

- MNNIT Allahabad
- MNIT Jaipur
- MMMUT Gorakhpur
- MANIT Bhopal
- DMSRDE Kanpur
- HBTU Kanpur
- IIT Jodhpur
- NIT Raipur
- IIT Madras
- IIT Patna
- IIT Kharagpur
- NIT Srinagar
- BIET Jhansi
- INST Mohali
- CSIR - IMMT Bhubaneswar
- PDEU Raisan Gandhinagar
- NIT Rourkela
- SATI Bidisha
- UPES Dehradun
- ITM Gida Gorakhpur
- AKTU (CAS) Lucknow
- VNIT Nagpur
- Institute of Technology & Management Gorakhpur
- VIT Vellore
- MMDCH Darbhanga
- Manipal University Jaipur
- Woxsen University Hyderabad
- Thapar University
- CKS Teja Andra Pradesh
- BBAU Lucknow
- Rajiv Gandhi Institute of Petroleum Technology
- Sardar Patel Medical Collage
- Lucknow
- BBDCODS Lucknow
- NIT Meghalaya
- BBDU Lucknow
- DTU Delhi
- King George's Medical University
- Dayalbagh Education Institute Agra
- **AND MANY MORE...**

Overall Assessment of Optical Profilometer Facilities at ACMS

LIMITATIONS:

1. Tribology samples with bigger track dia are restricted to scan as we have objective(2.5X) of max scanning area of about 1.4X1.9mm square that consumes lots of time and heating to the instrument.

CAPABILITY:

1. In last 10 years since the Instrument installed in ACMS only one time breakdown in 2020 for 4 months due to software issue that resolved without any cost, hence instrument has zero maintenance cost till now.
2. Well trained staffs capable enough to handle modern instrumentation and software.
3. ACMS is well supported by Institute in terms of infrastructural resources (e.g. uninterrupted power supply)
4. Expert faculty members of IITK working on various research areas.

SCOPE:

1. Need of 5X and 10X objective for wide range of scanning area and resolution.
2. NABL Accreditation to make the lab a more reliable in terms of data.

Annexure VII



Advanced Centre for Materials Science Indian Institute of Technology Kanpur

Usage Statistics and Yearly Status Report

Indentation Lab

(Room #108A, ACMS)

Dr. Anish Upadhyaya
(*Head, ACMS*)

Dr. Kantesh Balani
(*Faculty In-charge*)

Mr. Rupesh Kumar Sharma
(*Sr. Technician, Facility Staff In-charge*)

Major Facilities *under Indentation Lab, ACMS*

	Instrument Name	Manufacturer	Capacity	Mechanism	Additional Setup	Standard Testing	Year of Installation
1	Instrumented Nanoindentation TI-750	<i>Hysitron Inc.</i>	<i>10μN to 10mN for Indentation 10μN to 1.2mN for Scratch</i>	<i>Electrostatic (Transducer and Load cell)</i>	<i>Temperature Control (400° C)</i>	<i>Indentation, Scratch, Modulus Mapping, SPM In-Situ Imaging</i>	2013
2	Instrumented Micro Indentation MCT	<i>CSM Instruments</i>	<i>30 mN -30 N</i>	<i>Electrostatic (Transducer and Load cell)</i>	<i>Temperature Control (450° C)</i>	<i>Indentation with Vicker and Knoop Indentor, Scratch,</i>	2013
3	Universal Hardness Testing System FH-10-0000	<i>Tinius Olsen</i>	<i>500 gf -250 Kgf</i>	<i>Electrostatic (Transducer and Load cell)</i>	<i>RT</i>	<i>Rockwell, Brinell, Vicker Indentation</i>	2013

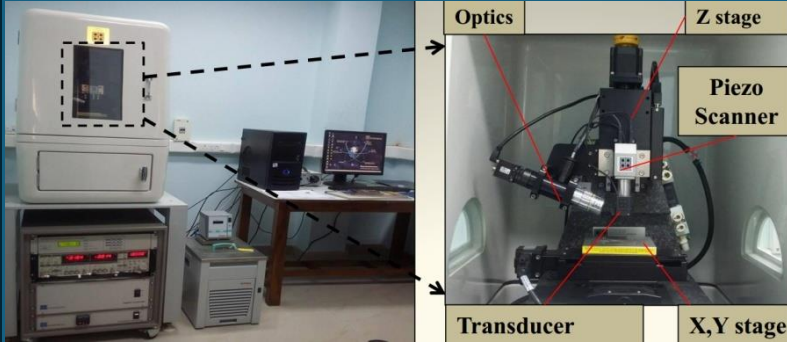
N.B.: No instrument procured after 2014.

Instruments Purchase details of Indentation Lab at ACMS

S. No	Name of Instrument	Make	P.O. No.	Dated	Value	
1	Nano Mechanical Test System TI 750	Hysitron Inc	NC-2427	31-03-2013	Total in (USD)	241968
2	Micro indentation Tester MCT	CSM Instruments	NC-2429	31-03-2013	Total in (USD)	160987
3	Universal Hardness Tester FH-10	Tinius Olsen	NC-2428	31-03-2013	Total in (EUR)	51853

Specifications of Instruments *housed-in* Indentation Lab

Instrumented Nano Mechanical Test System(TI-750)



- ❑ Manufactured by Hysitron Inc. USA
- ❑ Electrostatic with Transducer and Load Cell
- ❑ Max. Load Capacity: 10 mN
- ❑ Min Load Capacity : 10 μ N
- ❑ Load Types: Quasistatic, sinusoidal force at high frequency, DMA
- ❑ Test Type: Indentation ,Scratch, Modulus Mapping, in-situ SPM Imaging
- ❑ Load Resolution: 1nN in Z axis
- ❑ Displacement Resolution: 0.04nm

Instrumented Micro Hardness Tester(MCT)



- ❑ Manufactured by CSM Instruments-Switzerland
- ❑ Electrostatic with Transducer and Load Cell
- ❑ Max. Load Capacity: 30 N
- ❑ Min Load Capacity: 30 mN
- ❑ Test Types: : Indentation and Scratch
- ❑ Load Resolution: .3 mN in Z axis
- ❑ Displacement Resolution: 0.3nm
- ❑ Indenter : Diamond Vicker and Knoop for Indentation and 120° Diamond conospherical for scratch

Universal Hardness Tester(FH-10)



- ❑ Manufactured by Tinius Olsen UK
- ❑ Electrostatic with Load Cell
- ❑ Max. Load Capacity: 250 kgf
- ❑ Min Load Capacity: 5 gf
- ❑ Test Load Types: Load cell close loop and force feed System
- ❑ Indenter Type:
 - Brinell Hardened steel Ball-1,2.5,5,10 mm
 - Vicker Diamond-136°
 - Rockwell Carbide 120°
 - Ball-1/16,1/8,1/4,1/2 in

Summary Outline of ACMS Indentation Lab

- Total **3 different dedicated test facilities** installed in the Indentation Lab at ACMS.
- Indentation Lab is equipped to perform more than **4 types of mechanical tests**.
- Over **5933 Samples** have been tested so far between 2014 to 2026 at Indentation Lab.
- Total **7,077 Hours** of equipment usage time utilized in conducting various Mechanical Tests.
- **9% of total users** are **External** (including National and Regional Academic Institutions ; R&D Organisation; and Industries).
- Faculty, Research Scholars and Students from **13 Departments and Centers at IIT Kanpur** have utilized IL facilities since their installation in 2014.
- A total revenue of around **Rs 14.82 Lakh generated and contributed to LDA of Indentation Lab** till date.
- The facility has operated in **self-sustained mode** and met ~77% of its expenditures through LDA and balance **23%** from ACMS Budget. After taking into consideration, expenditures incurred for upgradation, maintenance and repairs, the facility **LDA has** as on July 2026 a balance of **Rs 12.83 Lakhs**.
- Since its inception, Indentation Lab Facilities at ACMS have not sought any special Grant / Funds from Institute.

Yearly Summary Table of **Number of Samples Tested by Each Instrument**

	<i>Number of Samples Tested by Specific Instrument</i>			
Year	INSTRUMENTED NANOINDENTATION	MICRO HARDNESS TESTER	UNIVERSAL HARDNESS TESTER	Grand Total
2014	30	82	98	210
2015	256	302	560	1118
2016	108	190	277	575
2017	42	130	215	387
2018	118	156	311	585
2019	68	184	160	412
2020	69	136	14	219
2021	130	330	176	636
2022	166	242	70	478
2023	354	*	99	453
2024	354	*	75	429
2025	204	*	81	278
2026	122		24	146
Total	2021	1752	2160	5933

* instrument was down during this period.

Total 5,933 Samples analysed at Indentation Lab in ACMS since 2014

Yearly Summary Table of **Usage Time (Hours)** by Each Instrument

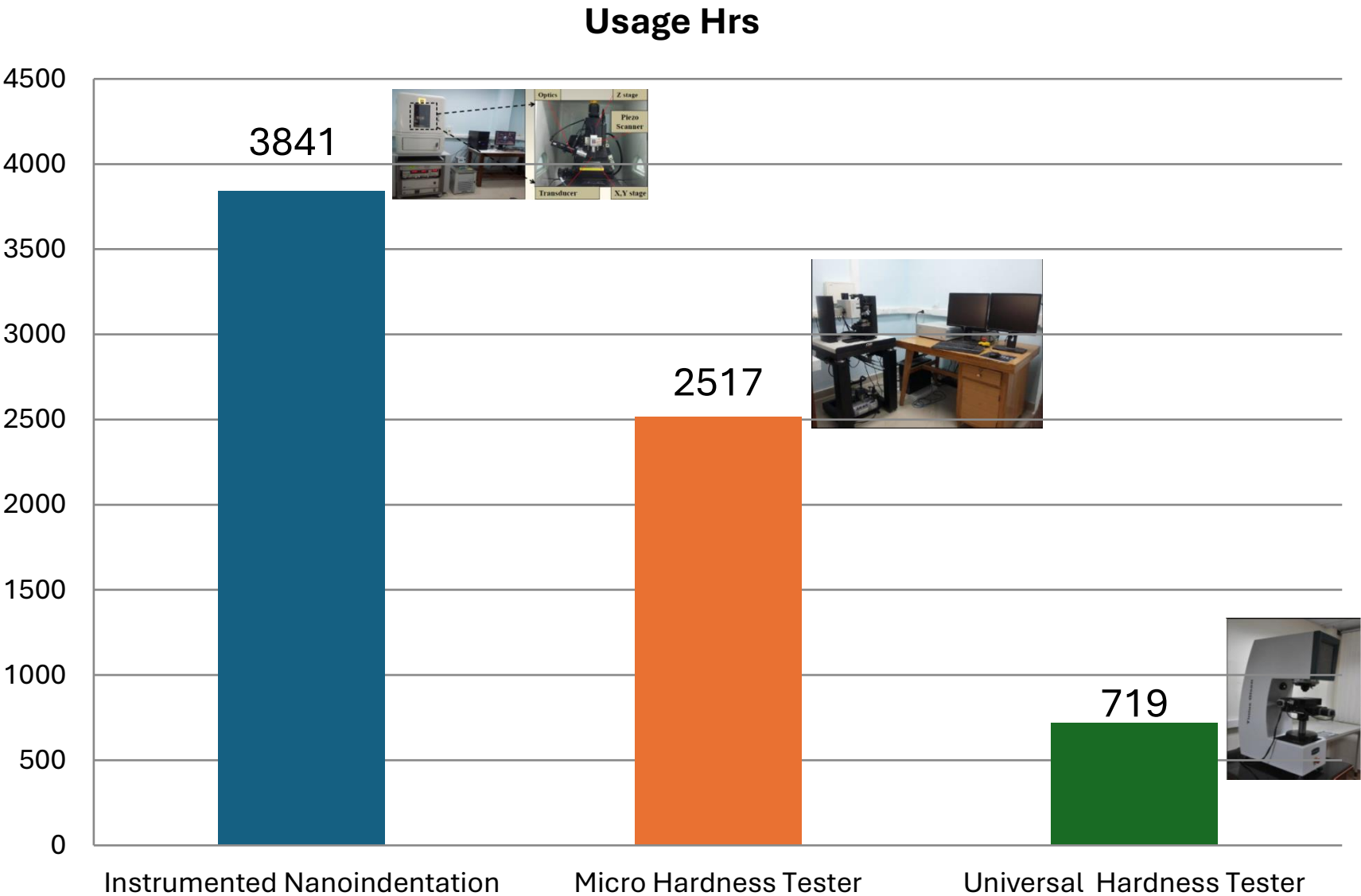
	<i>Number of Usage Time (Hours) by Specific Instrument</i>			
Year	INSTRUMENTED NANOINDENTATION	MICRO HARDNESS TESTER	UNIVERSAL HARDNESS TESTER	Grand Total
2014	44	97	25	165
2015	391	447	144	981
2016	171	293	70	534
2017	63	186	59	307
2018	163	231	101	495
2019	96	263	44	403
2020	105	194	6	304
2021	294	459	111	865
2022	313	348	41	702
2023	756	*	48	804
2024	792	*	27	818
2025	409		32	441
2026	246		13	259
Total	3841	2517	719	7077

* instrument was down during this period.

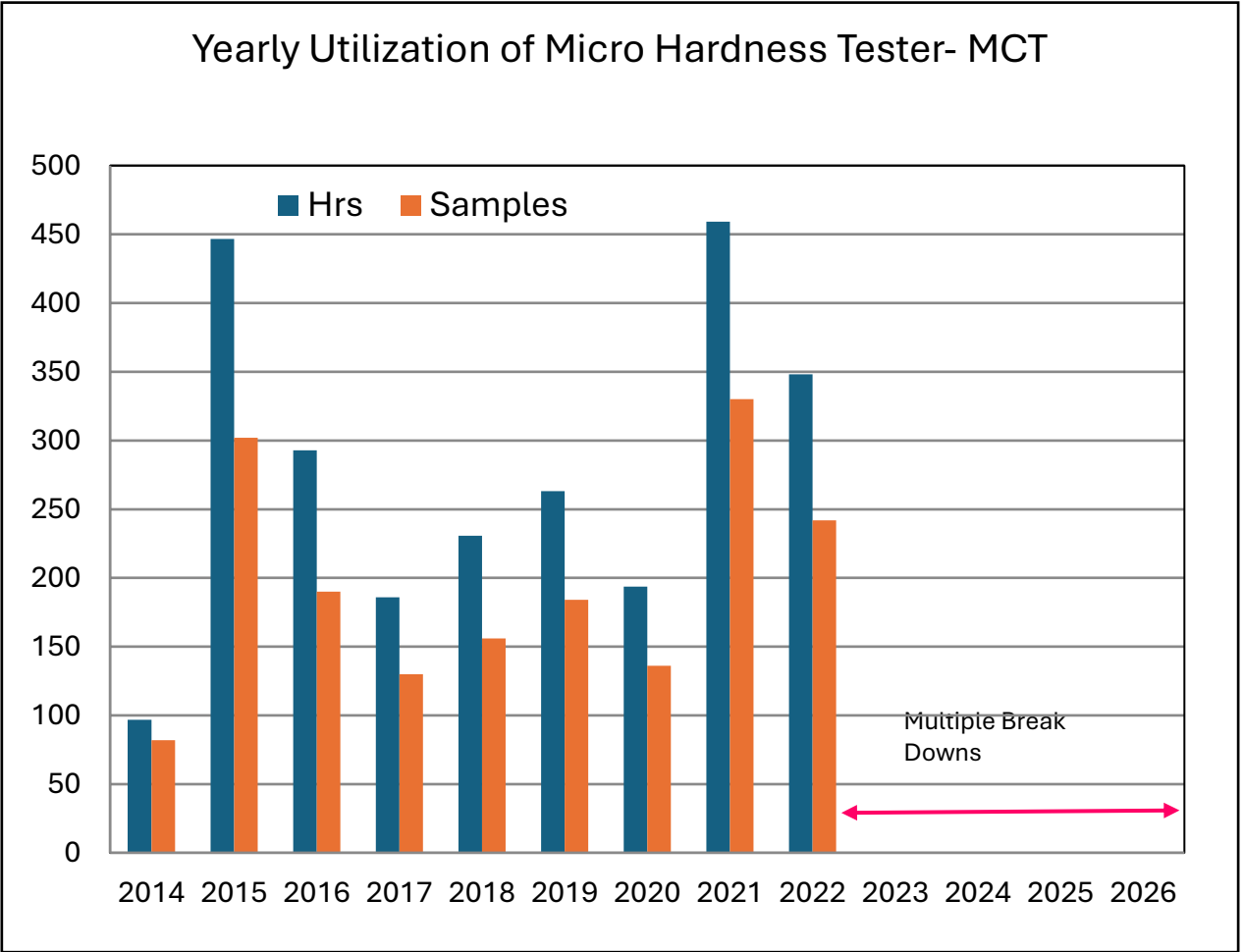
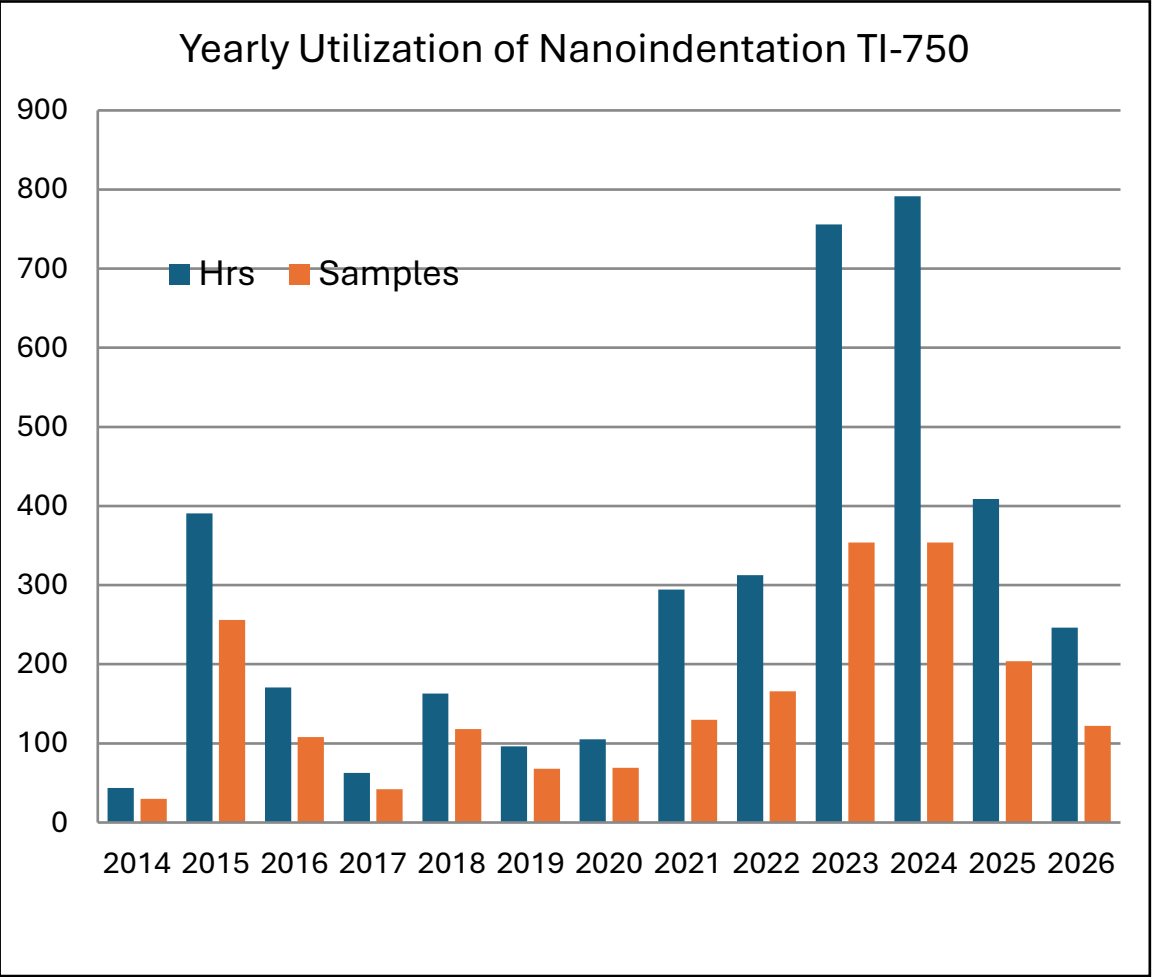
Total 7,077Hours of Operation on various instruments in Indentation Lab since 2014.

Graphical presentation of Total Usage of Instruments by Operational Hours

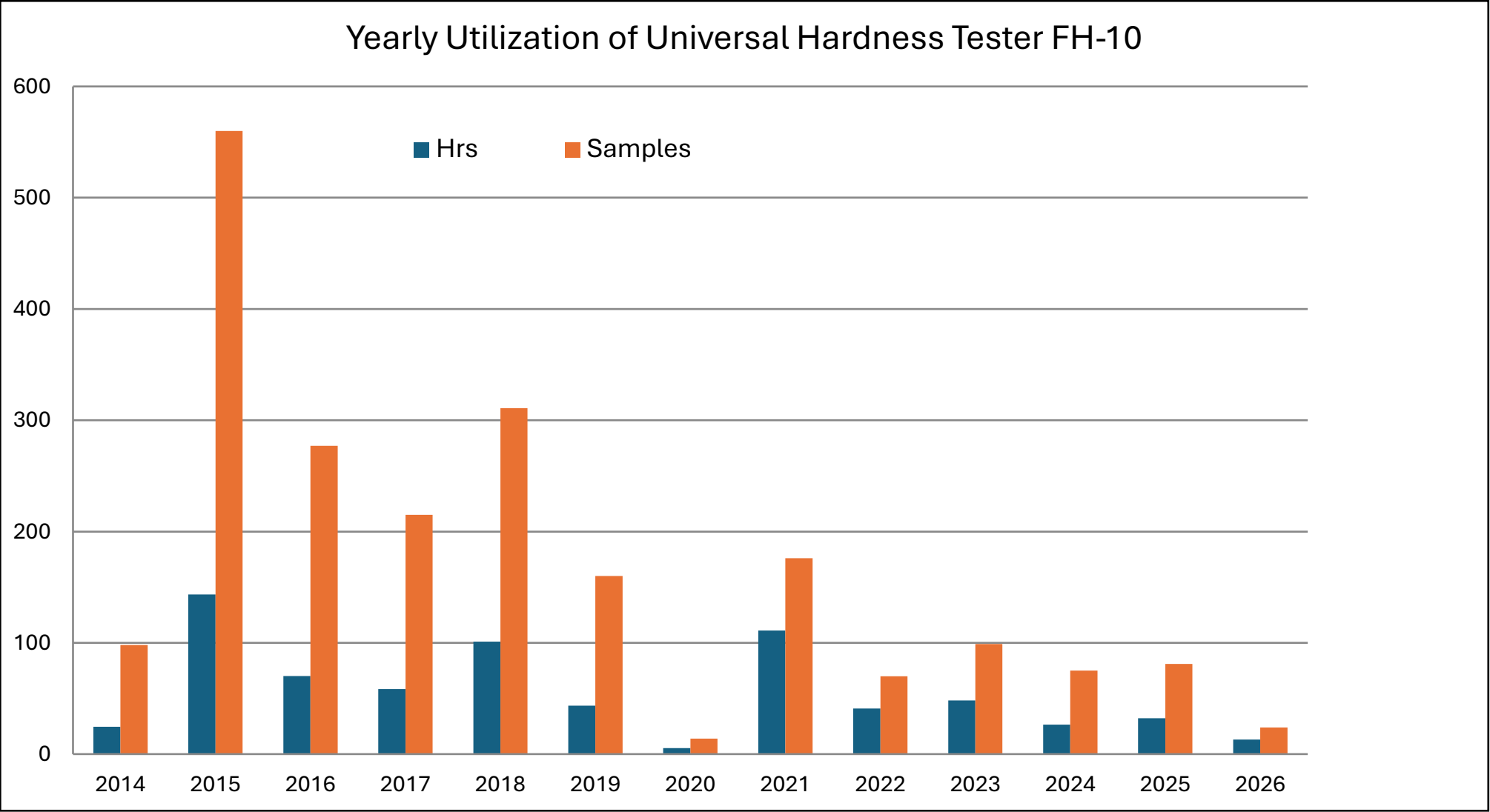
Instrument	Usage Hours
Instrumented Nanoindentation	3841
Micro Hardness Tester	2517
Universal Hardness Tester	719
Grand Total	7,077



Year-to-Year Usage of Instruments *vis a vis* Number of Samples and Usage Time



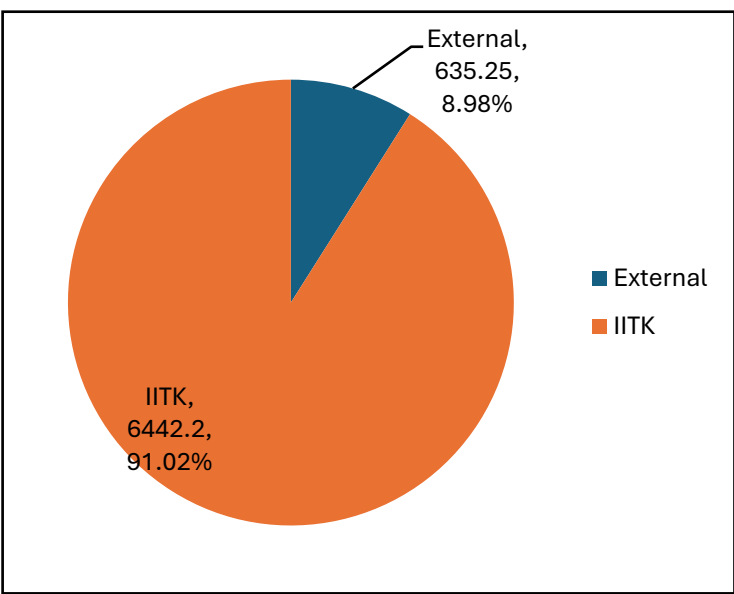
Year-to-Year Usage of Instruments *vis a vis* **Number of Samples** and **Usage Time**



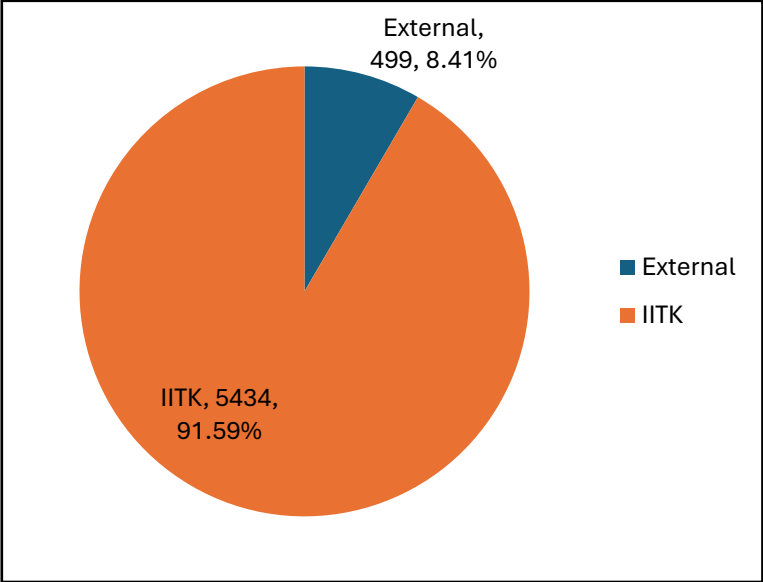
Usage Statistics of Indentation Lab Instruments by **IITK (Internal)** and **Non-IITK (External)** Users

Year	IITK Users		External Users	
	Samples	Hours	Samples	Hours
2014	210	165	-	-
2015	1038	872	80	109
2016	457	356	118	178
2017	338	252	49	56
2018	538	444	47	51
2019	381	357	31	46
2020	198	273	21	32
2021	588	819	48	45
2022	436	653	42	49
2023	430	780	23	24
2024	418	813	11	6
2025	275	435	10	7
2026	127	225	19	34
Total	5434 Samples (IITK)	6442hrs (IITK)	499 samples (Ext)	635 hrs (Ext)

Total Number of Samples Tested: **5,933**



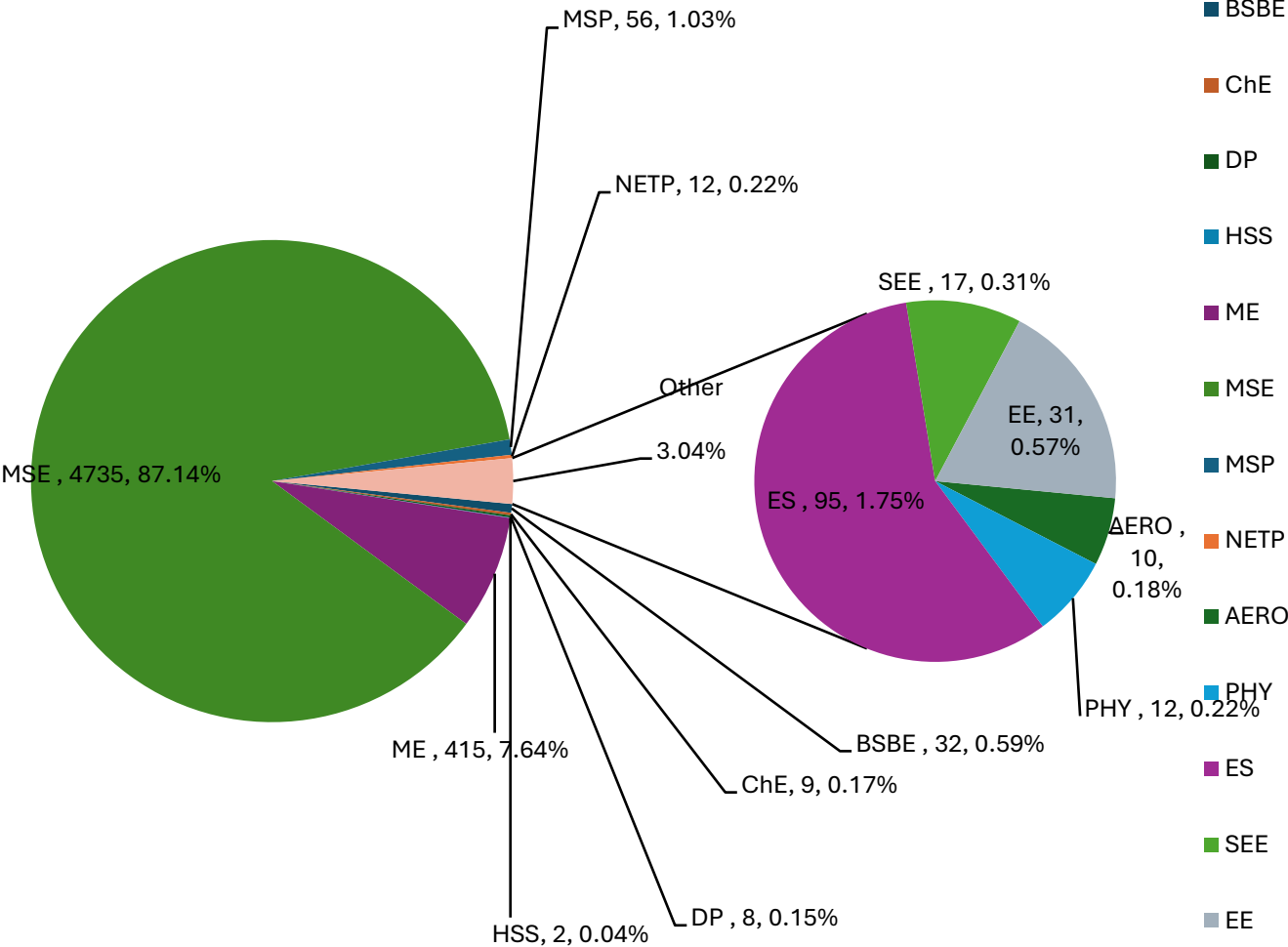
Total Usage Time: **7,077 hrs**



- Total **5,933 Samples** so far tested in IL in over **7,077 hrs** of usage of facilities.
- Out of total overall usage, **9% of samples** and **8% of usage time** is by **External Users**

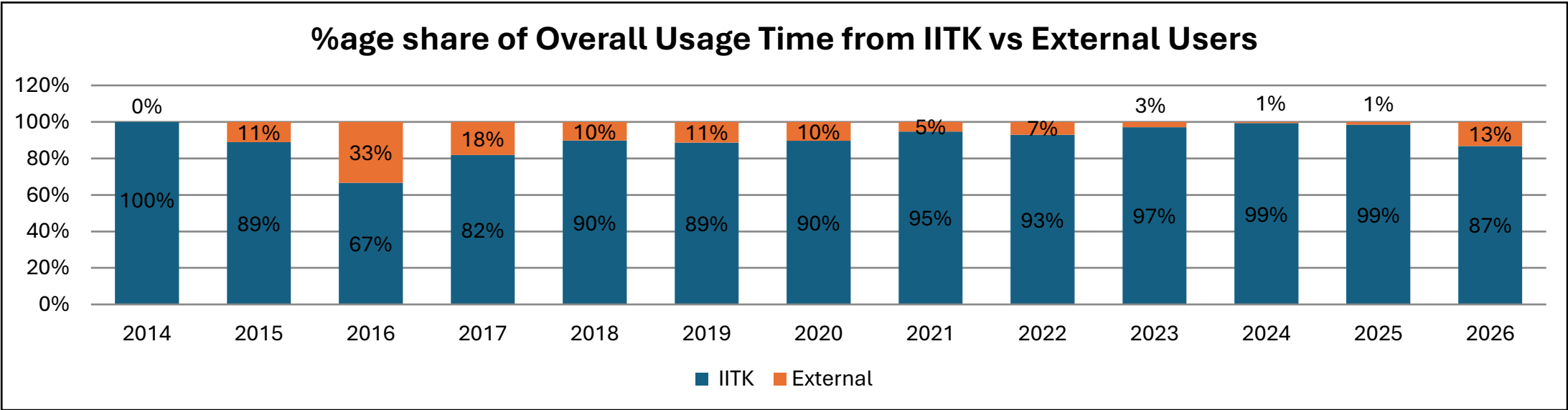
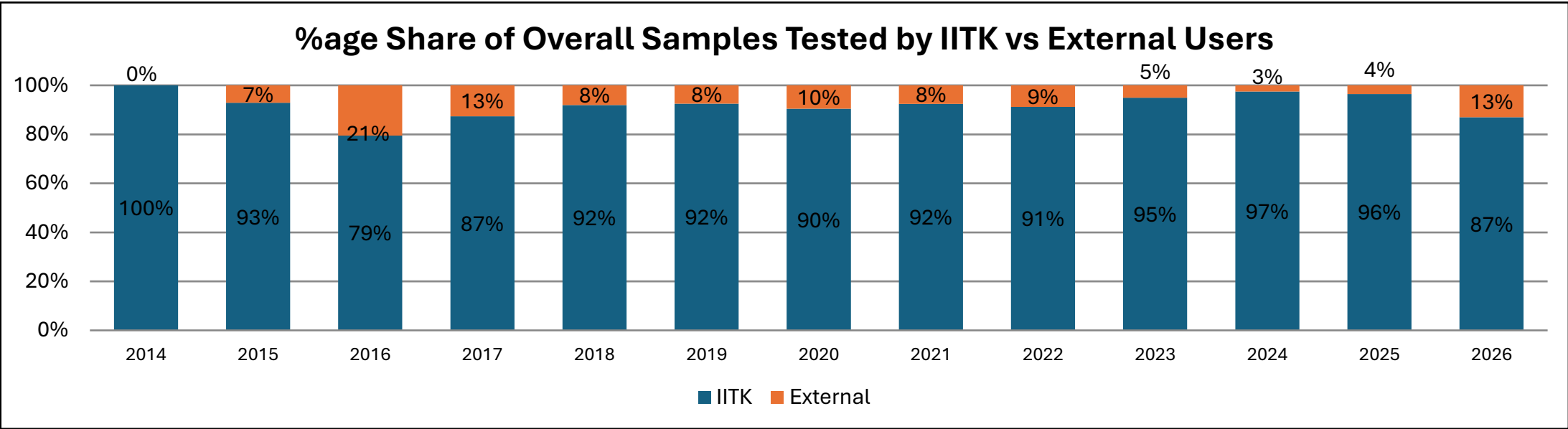
Usage Statistics of Indentation Lab Instruments Within IITK by various departments and centers

Dept.	Samples	Hrs
BSBE	32	37
CHE	9	13
DP	8	4
HSS	2	2
ME	415	414
MSE	4735	5603
MSP	56	63
NETP	12	22
AERO	10	2
PHY	12	16
ES	95	216
SEE	17	25
EE	31	25
Grand Total	5434	6442



Percentage Usage (Samples)	
BSBE	0.59
ChE	0.17
DP	0.15
HSS	0.04
ME	7.64
MSE	87.14
MSP	1.03
NETP	0.22
AERO	0.18
PHY	0.22
ES	1.75
SEE	0.31
EE	0.57

Usage Statistics of Indentation Lab Instruments by **IITK (Internal) & Non-IITK (Ext.)** Users



Testing Charges for Facilities Housed in Indentation Lab at ACMS

S.No	Name of Facility	Internal IITK Users	Non IITK Academia Users + Tax	National Lab + Tax	Industries and private labs + Tax	Slot duration
1	INSTRUMENTED MICRO INDENTATION CSM Instrument MHT-01-05721(MICRO COMBI TESTER)	For Indentation: Rs.250/Slot For Scratch: Rs.400/Slot For Image of Indent or Scratch: Rs 100/Image	For Indentation: Rs.1000/Sample + 18% (G.S.T) (12-16 indents for ~ 1-1.5 hrs) For Scratch: Rs.2000/Sample + 18% (G.S.T) (Max. 3 scratches for ~ 1-1.5 hrs) For Image of Indent or Scratch: Rs 300/Image + 18% (G.S.T)	For Indentation: Rs.2000/Sample + 18% (G.S.T) (12-16 indents for ~ 1-1.5 hrs) For Scratch: Rs.4000/Sample + 18% (G.S.T) (Max. 3 scratches for ~ 1-1.5 hrs) For Image of Indent or Scratch: Rs 500/sample + 18% (G.S.T)	For Indentation: Rs.3000/Sample + 18% (G.S.T) (12-16 indents for ~ 1-1.5 hrs) For Scratch: Rs.5000/Sample + 18% (G.S.T) (Max. 3 scratches for ~ 1-1.5 hrs) For Image of Indent or Scratch: Rs 1000/Image + 18% (G.S.T)	3Hrs

Testing Charges for Facilities Housed in Indentation Lab at ACMS

S.No	Name of Facility	Internal IITK Users	Non IITK Academia Users + Tax	National Lab + Tax	Industries and private labs + Tax	Slot duration
2	NANO INDENTATION Hysitron / Bruker TI 750 model	For Indentation: Rs.450/Slot For Scratch: Rs.700/Slot For SPM image: Rs. 150/Image	For Indentation: Rs.2500/Sample + 18% (G.S.T) (12-16 indents for ~ 1-1.5 hrs) For Scratch: Rs.3000/Sample + 18% (G.S.T) (Max. 3 scratches for ~ 1-1.5 hrs) For SPM image: Rs.550/ Image + 18% (G.S.T)	For Indentation: Rs.5000/Sample + 18% (G.S.T) (12-16 indents for ~ 1-1.5 hrs) For Scratch: Rs.6000/Sample + 18% (G.S.T) (Max. 3 scratches for ~ 1-1.5 hrs) For SPM image: Rs.1500/ Image + 18% (G.S.T)	For Indentation: Rs.6000/Sample + 18% (G.S.T) (12-16 indents for ~ 1-1.5 hrs) For Scratch: Rs.8000/Sample + 18% (G.S.T) (Max. 3 scratches for ~ 1-1.5 hrs) For SPM image: Rs.2000/ Image + 18% (G.S.T)	3Hrs

Testing Charges for Facilities Housed in Indentation Lab at ACMS

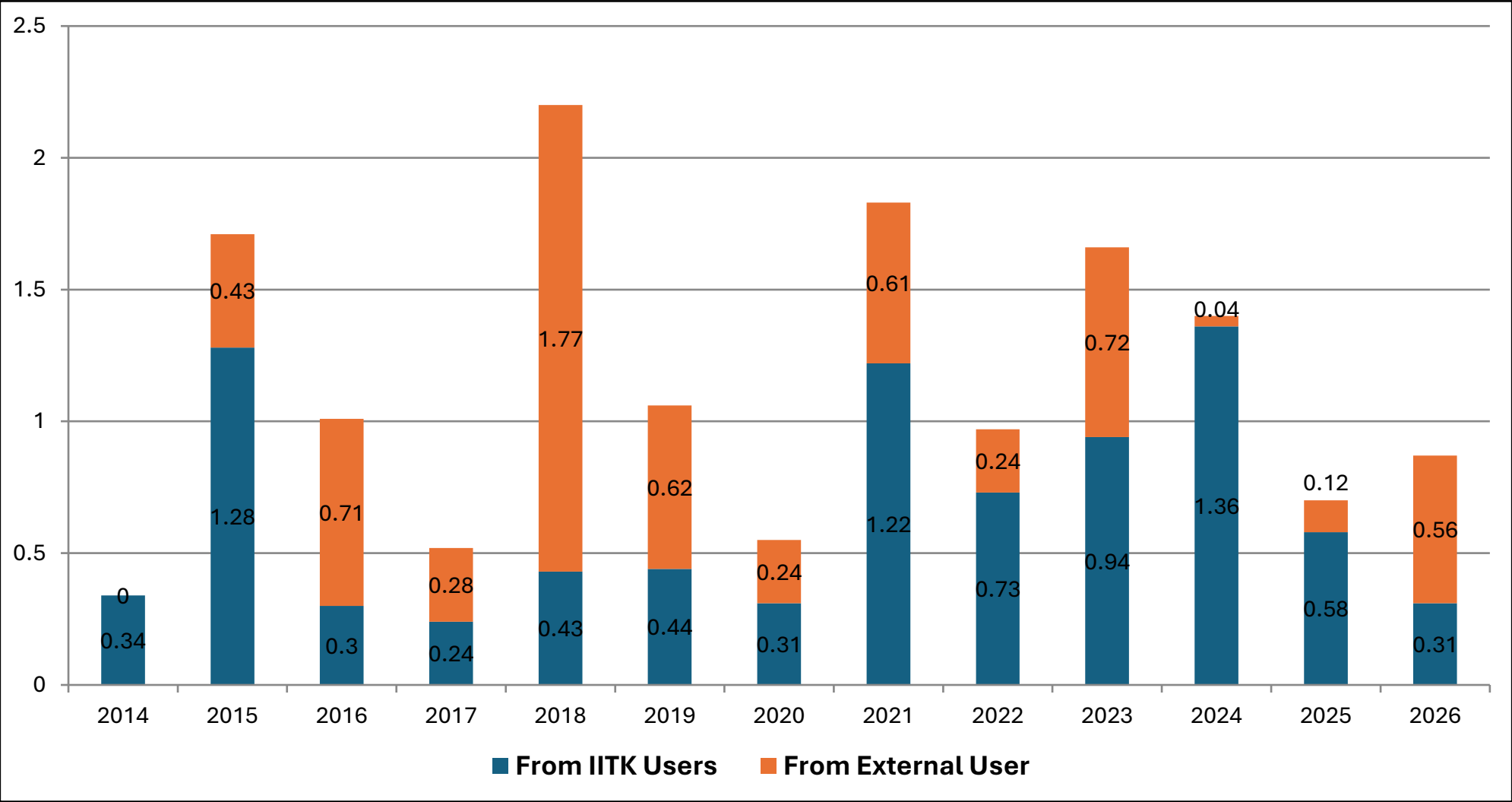
S.No	Name of Facility	Internal IITK Users	Non IITK Academia Users + Tax	National Lab + Tax	Industries and private labs + Tax	Slot duration
3	UNIVERSAL HARDNESS TESTER FH-10	Free	Rs.100/sample Max 10 indent		Rs.500/sample Max 10 indent	

Revenue Generated from IITK (Internal) and Non-IITK (External) Users

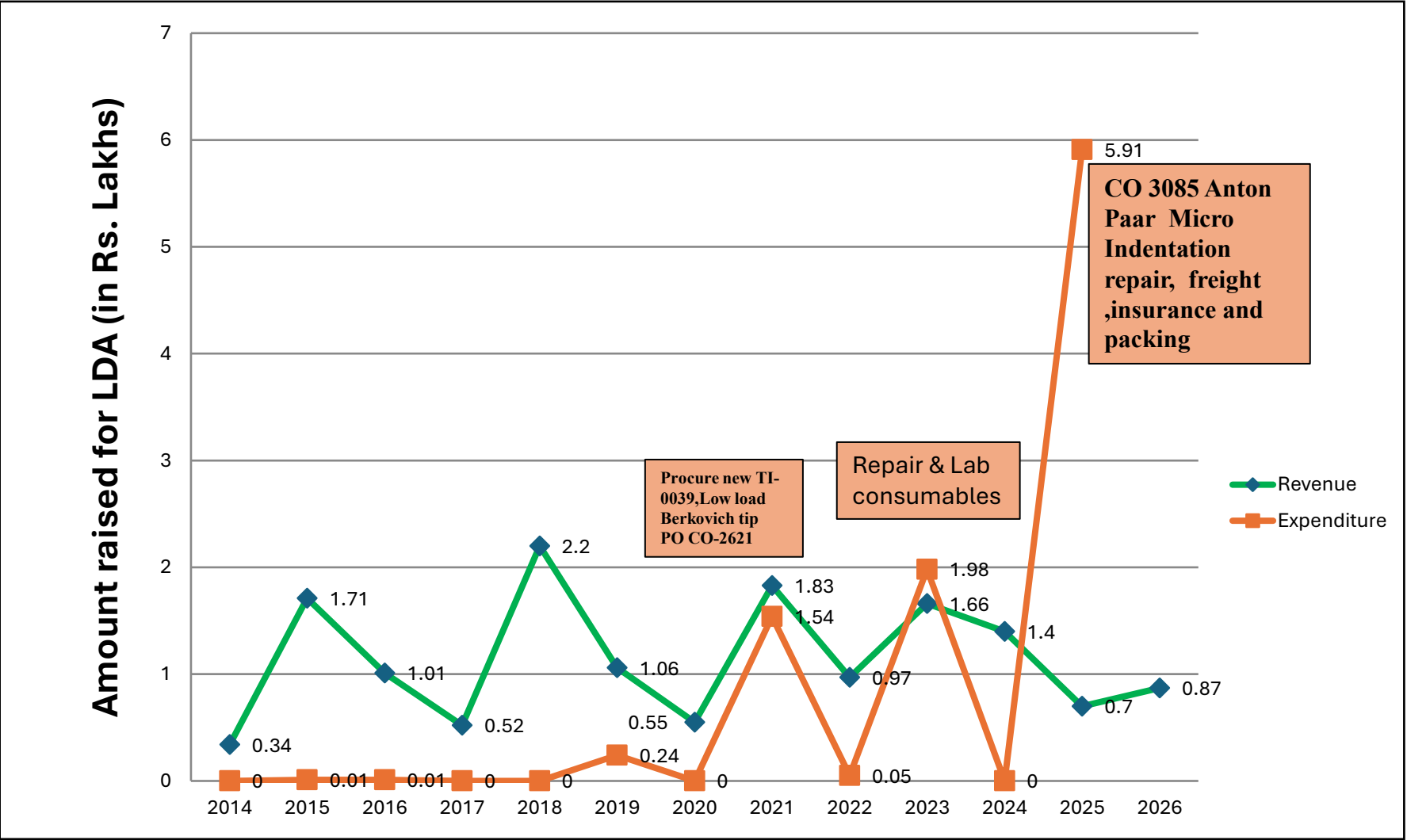
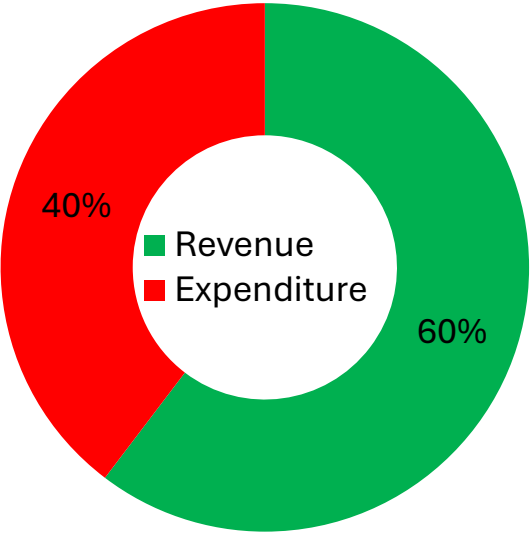
	Revenue Generated Through User Charges (in Rs)		
	Internal Users	External Users	
Fiscal Year	IITK Users to LDA	Testing Amount (inc. Tax)	Total Revenue
2014	34,000	-	0.34
2015	1,28,000	43,000	1.71
2016	30,000	71,000	1.01
2017	24,000	28,000	0.52
2018	43,000	1,77,000	2.20
2019	44,000	62,000	1.06
2020	31,000	24,000	0.55
2021	1,22,000	61,000	1.83
2022	73,000	24,000	0.97
2023	94,000	72,000	1.66
2024	1,36,000	4,000	1.40
2025	58,000	12,000	0.70
2026	31,000	56,000	0.87
Total	8,48,000	6,34,000	14.82 Lakhs

Earlier Indentation lab includes other facility also i.e. Optical Profilometer, Optical Microscope and Impact Tester and have same LDA account between 2014 to 2025, presently LDA have 12.83 Lakhs after all maintenance and repair expenditures.
Excessive amount shown in LDA account is contributed by Prof. Kantesh Balani Projects.

Revenue Generated from IITK (Internal) and Non-IITK (External) Users



Revenue Generated (from User Charges) versus Expenditure (in Maintenance and Repair)



Lab & Maintenance Expenditure of Indentation Lab Equipments in ACMS

Year	Description	From LDA	From ACMS budget	Institute Special Grant
2015	Lab Consumables	1154	-	-
Sub-Total		Rs.1,154	Nil	Nil
2016	User charges	1000	-	-
Sub Total		Rs 1,000	Nil	Nil
2019	Repair Work	-	23600	
Sub Total		NIL	23600	Nil
2021	TI-0039,Low load Berkovich tip PO CO-2621	154200	-	-
Sub Total		Rs 1,54,200	Nil	Nil
2022	Lab Consumables	4850	-	-
Sub Total		Rs 4,850	-	Nil
2023	Repair Work	84075	-	-
	Lab Consumables	5448	108939	-
Sub Total		Rs 89,523	Rs 1,08,939	Nil
2025	Repair, packing ,freight and Insurance ap	Rs 5,00,686	Rs 89,857	45 L+Tax
Grand Total		Rs 7,51,413	Rs 2,22,396	45 L+Tax

- Since installation (2014) to 23 July 2026 so far Rs 9.73 Lakhs has been spent for Indentation Lab facility upkeep. out of which Rs 7.51 Lakhs (77% of total) is from Lab Development Account (LDA-IITK-ACMS-2023696) which has been sustained through User Charges. The remainder part of Maintenance Expenses for Indentation Lab facilities Rs 2.22 Lakhs (23% of total) was through ACMS Budget and 45L+tax Inst. Special Grant.
- Taking into consideration maintenance and repair expenses of facilities and contribution to R&D account, as on 23 July 2026, LDA of Indentation Lab @ACMS has Rs. 12.83 Lakh! Due to same LDA account with other facilities and contributed by Prof. Kantesh Balani Projects the generated fund is more then what we have shown.

Key External Users of Indentation Lab Facility at ACMS from Academia, R&D organizations and Industries

Academic Institutes

- | | | |
|--|---|---|
| <ul style="list-style-type: none">• IIT PATNA• GBPIET UTTARAKHAND• IIT DELHI• OSMANIA UNIVERSITY HYDERABAD• MANIPAL COLLEGE OF DENTAL SC. KARNATKA• DAV(PG) COLLEGE KANPUR• MNIT JAIPUR• NIT SILCHAR ASSAM• UIET PUNJAB UNIVERSITY CHANDIGARH• IIT INDORE• MANIT Bhopal• SLIET PUNJAB• NRLC LUCKNOW• INST MOHALI• CPP- IPR, SONAPUR ASSAM• UPES, Dehradun(Uttarakhand)• NIT Meghalaya• OSMANIA UNIVERSITY HYDERABAD | <ul style="list-style-type: none">• SARDAR PATEL POST GRAD. INST. LUCKNOW• IIT PATNA• IIT BHU• MNNIT ALLAHABAD• HBTI KANPUR• HBTU KANPUR• DMSRDE KANPUR• KAZIRANGA UNIVERSITY ASSAM• IIT PATNA• PSIT KANPUR• SERB-NPDF, MME, IIT – MADRAS• Dr. B.R.AMBEDKAR NATIONAL INSTITUTE OF TECHNOLOGY-PUNJAB• RAMA DENTAL COLLEGE KANPUR• CPP- IPR, NAZIRAKHAT SONAPUR ASSAM• I.G.I.T. SARANG ODISA• NIT RAIPUR• UIET CSJM UNIVERSITY KANPUR | <ul style="list-style-type: none">• NIT AGARTALA• NIT PATNA• IIT(ISM) DHANBAD• NIET GREATER NOIDA• CPP- IPR, NAZIRAKHAT SONAPUR ASSAM• DAYALBAGH EDUCATIONAL INSTITUTE AGRA• MMM UNIVERSITY OF TECHNOLOGY GORAKHPUR• SARDAR PATEL POST GRAD. INST. LUCKNOW• AND MANY MORE... |
|--|---|---|

Industries & R&D Organisations

- WIGS & SONS KANPUR
- DMSRDE KANPUR
- TTK HEALTHCARE KERALA

Overall Assessment of Indentation Lab Facilities at ACMS

LIMITATIONS:

1. Indentation and scratching on high temperature is restricted as issue of calibration as a very old facilities.

CAPABILITY:

1. Well trained staffs capable enough to handle modern instrumentation and software.
2. ACMS is well supported by Institute in terms of infrastructural resources (e.g. uninterrupted power supply)
3. Expert faculty members of IITK working on various research areas.

SCOPE:

1. Need for Indentation Lab with higher capacity up to 250 kgf dedicated for Brinell Hardness test.
2. Need for Indentation Lab for catering micro-samples.
3. Need for Indentation Lab with capacity 10 μ N to 10mN with Nano indentation, 30mN to 30mN with micro indentation and micro scratch and facilitate available for Brinell, Rockwell and Vicker macro or bulk indentation . Also Modulus mapping and in-situ imaging available with NI for qualitative and quantitative analysis of pre and post investigate of sample surface
4. NABL Accreditation to make the lab a more reliable in terms of data.

Annexure VIII



Advanced Centre for Materials Science Indian Institute of Technology Kanpur

Usage Statistics and Yearly Status Report

BET Testing Facility

(TPL, Room # 113, ACMS)

Dr. Anish Upadhyaya
(Faculty In-Charge, TPL)

Mr. Kamlesh Thapliyal
(Tech. Supdt., Staff In-Charge)

Summary Outlines of ACMS Thermal Processing Lab (TPL)

- BET was installed in the Thermal Processing Lab (TPL) at ACMS.
- BET is equipped to perform **03 types of tests** .
- Over **1091 Samples** have been tested so far between 2014 to 2026 at TPL.
- Total **8728 Hours** of equipment usage time utilized in conducting various Tests.
- **46% of total users** are **External** (including National and Regional Academic Institutions ; R&D Organisation; and Industries).
- Faculty, Research Scholars and Students from **17 Departments and Centers at IIT Kanpur** have utilized TPL facilities since their installation in 2014.
- A total revenue of around **Rs 14.29 Lakh generated and contributed to LDA of TPL** till date. TPL has also contributed **Rs. 1.8 Lakhs to R&D** from the testing amount collected from External Users.
- After taking into consideration, expenditures incurred for upgradation, maintenance and repairs, **TPL LDA has still has balance of Rs 7 Lakhs (approx.) as on 28.07.2026.**
- Since its inception, TPL Facility at ACMS has not sought any special Grant / Funds from Institute.

Major Facilities *under* ACMS Thermal Processing Lab (TPL)

	Instrument Name	Manufacturer	Capacity	Mechanism	Additional Setup	Standard Testing	Year of Installation
1	BET Surface Area Analyzer	<i>Quatachrome Corp.</i>	<i>150/300 J</i>	<i>Motorized</i>	<i>LT Bath (-50° C)</i>	<i>BET-pore size</i>	2013

N.B.: No instrument procured after 2014.

Specifications of Instrument *housed-in* Thermal Processing Lab

BET Surface Area Analyzer



- ☐ Physisorption techniques are used to determine the surface area and pore structure
- ☐ Pore radii between 5 and 15 Angstroms
- ☐ Values of the BET area for porous materials vary between 50 to 2000m²/g
- ☐ It is also equipped with chemisorption analysis
- ☐ Thermal programming oxidation, reduction, and desorption

Yearly Summary Table of **Number of Samples Tested BET**

	<i>Number of Samples Tested by Specific Instrument</i>	Grand Total
Year	BET Surface Area Analyzer	
2014	18	18
2015	41	41
2016	36	36
2017	18	18
2018	55	55
2019	54	54
2020	75	75
2021	89	89
2022	127	127
2023	146	146
2024	173	173
2025	177	177
2026 (till 17 July)	82	82
Total	1091	1091

Total 1091 Samples analysed at BET in TPL since 2014

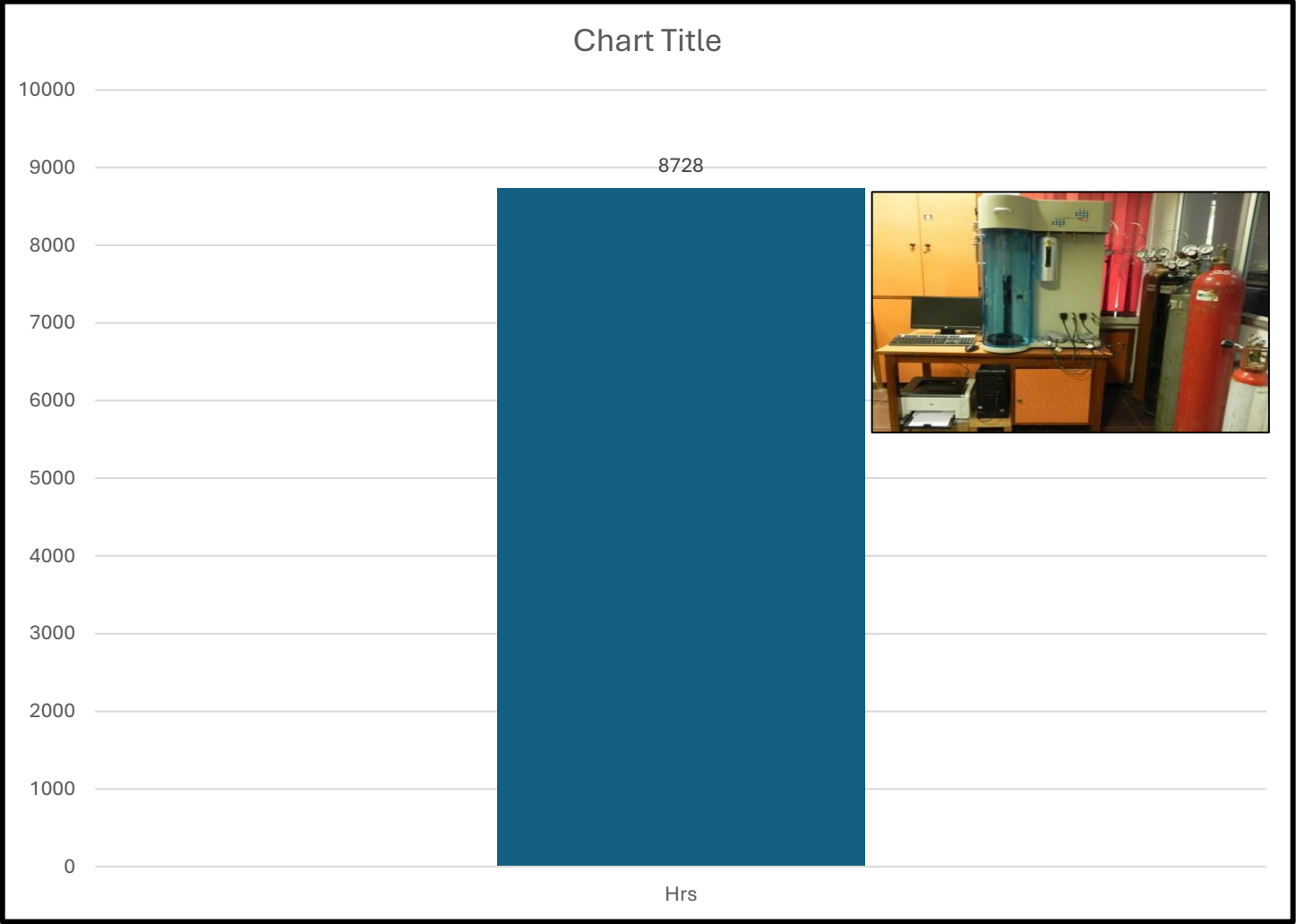
Yearly Summary Table of **Usage Time (Hours)** by Each Instrument

	<i>Number of Usage Time (Hours) by Specific Instrument</i>	
Fiscal Year	BET Surface Area Analyzer	Grand Total
2014	144	144
2015	328	328
2016	288	288
2017	144	144
2018	440	440
2019	432	432
2020	600	600
2021	712	712
2022	1016	1016
2023	1168	1168
2024	1384	1384
2025	1416	1416
2026	656	656
Total	8728	8728

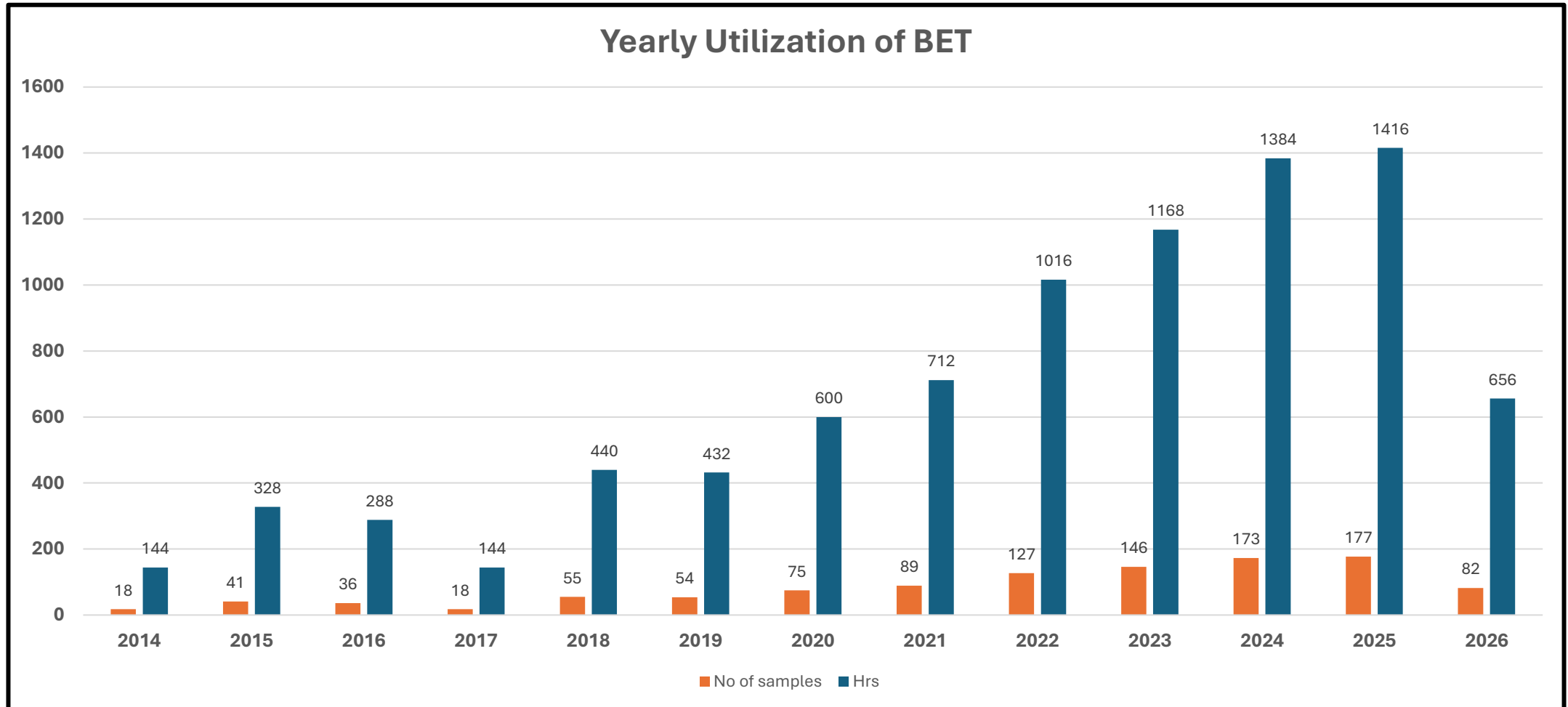
Total 8,728 Hours of Operation on BET since 2014.

Graphical presentation of Total Usage of Instruments by Operational Hours

Instrument	Usage Hours
BET Surface Area Analyzer	8728
Grand Total	8,728



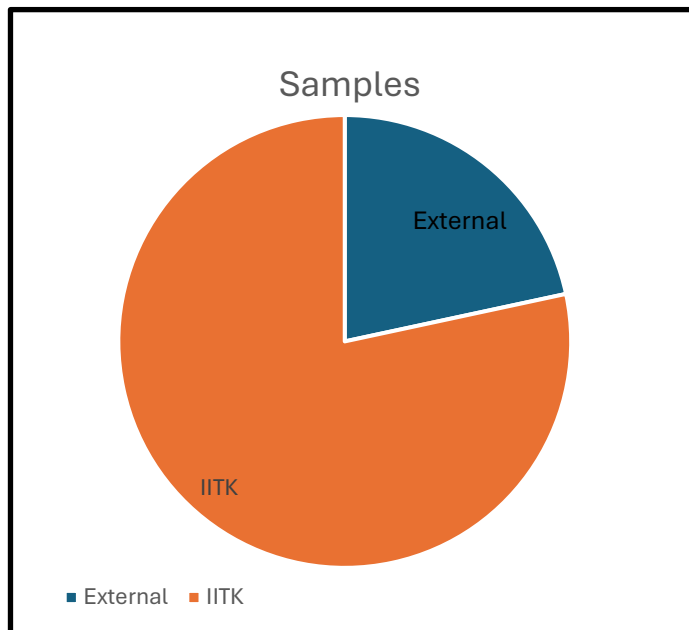
Year-to-Year Usage of Instruments *vis* Number of Samples and Usage Time



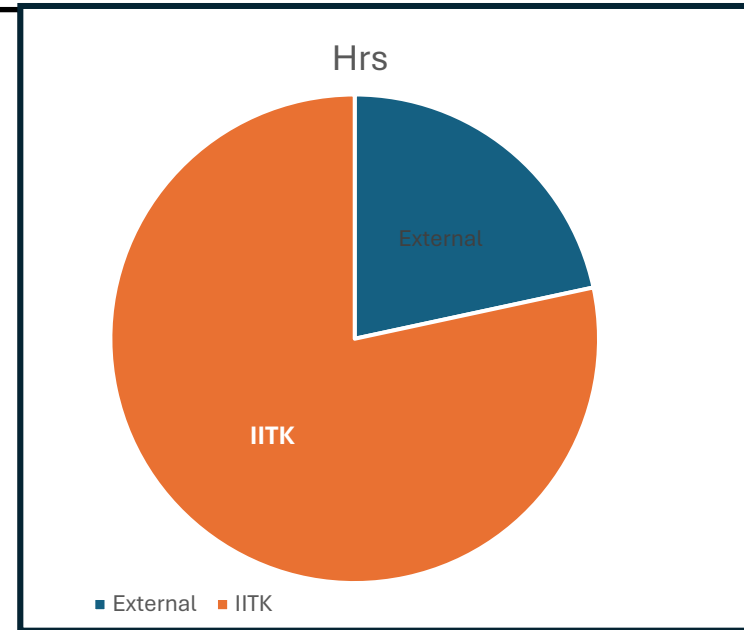
Usage Statistics of BET Instrument by **IITK (Internal)** and **Non-IITK (External)** Users

Fiscal Yr	IITK Users		External Users	
	Samples	Hours	Samples	Hours
2014	18	144		126
2015	41	328		104
2016	30	240	6	48
2017	17	136	1	8
2018	47	376	8	64
2019	42	336	12	96
2020	42	336	33	264
2021	62	496	27	216
2022	102	816	25	200
2023	119	952	27	216
2024	142	1136	31	248
2025	135	1080	42	336
2026	58	464	24	192
Total	855 <i>Samples</i> (IITK)	6840 <i>hrs</i> (IITK)	236 <i>samples</i> (Ext)	1888 <i>hrs</i> (Ext)

Total Number of Samples Tested: 1091



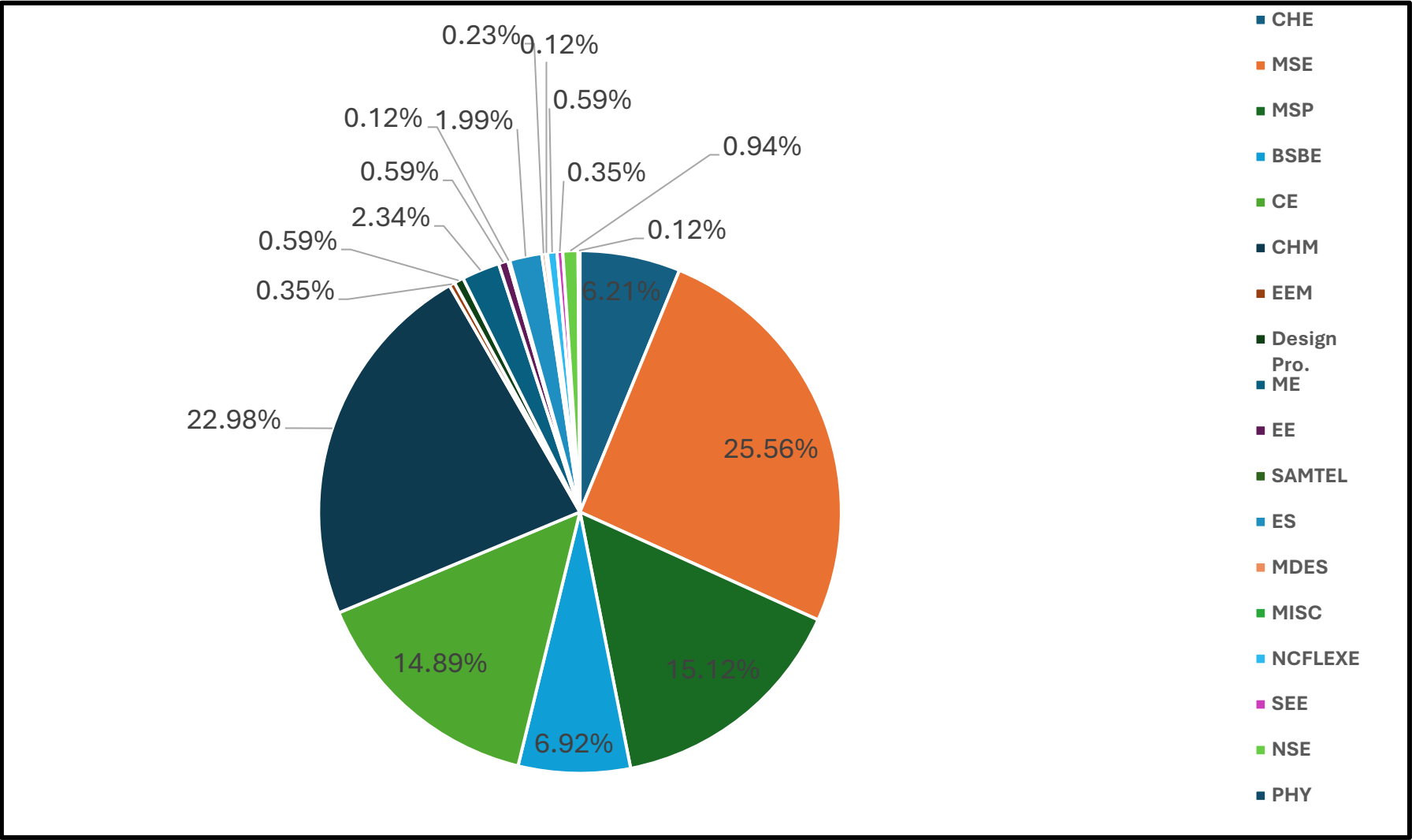
Total Usage Time: 8728 hrs



- Total **1091 Samples** so far tested in BET in over **8728 hrs** of usage of facilities.
- Out of total overall usage, **21% of samples** and **21% of usage time** is by **External Users**

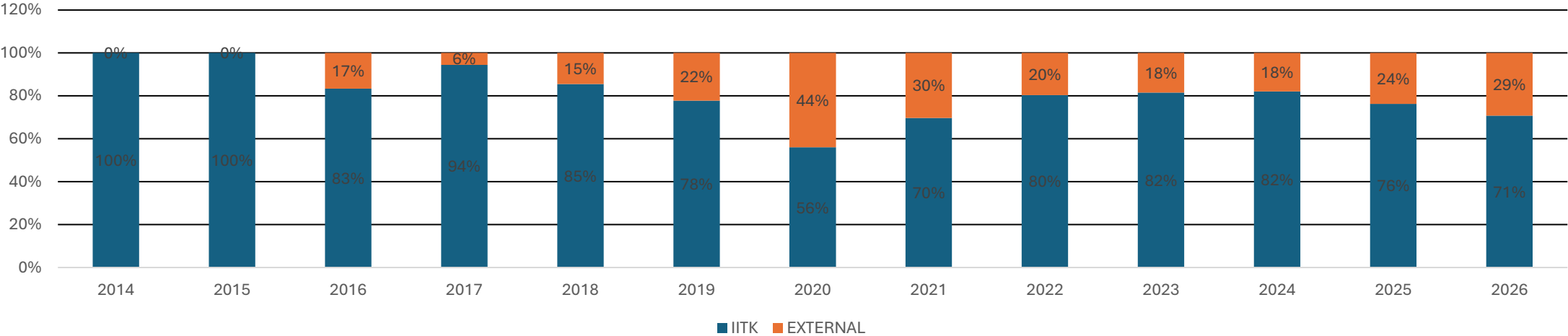
Usage Statistics of BET Instruments **Within IITK** by various Departments and Centers

Dept.	Samples	Hrs
CHE	53	424
MSE	218	1744
MSP	129	1032
BSBE	59	472
CE	127	1016
CHM	196	1568
EEM	3	24
Design Pro.	5	40
ME	20	160
EE	5	40
SAMTEL	1	8
ES	17	136
MDES	2	16
MISC	1	8
NCFLEXE	5	40
SEE	3	24
NSE	8	64
PHY	1	8
Grand Total	853	6824

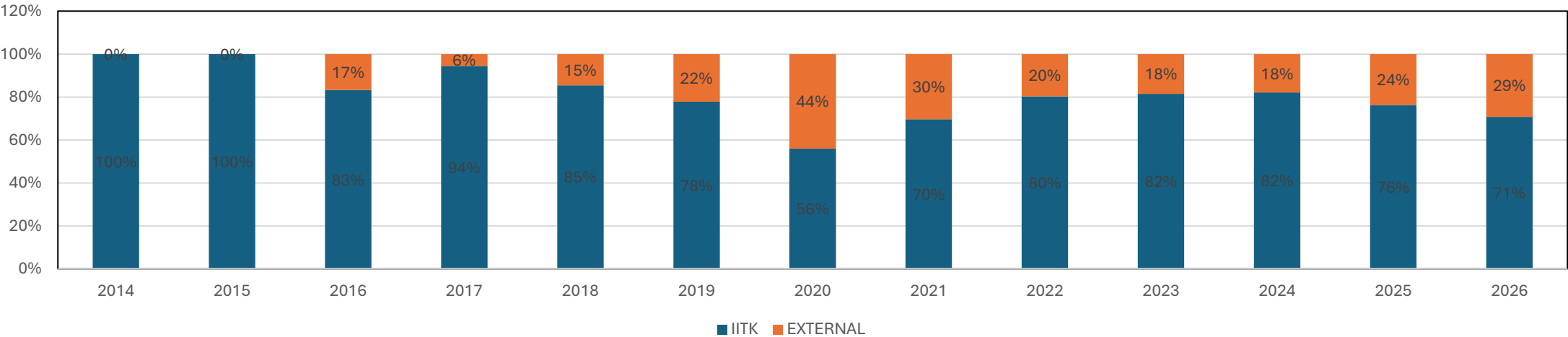


Usage Statistics of BET Instruments by IITK (Internal) and Non-IITK (External) Users

%age Share of Overall Samples Tested by IITK vs External Users



%age share of Overall Usage Time from IITK vs External Users



Testing Charges for BET Thermal Processing Lab at ACMS

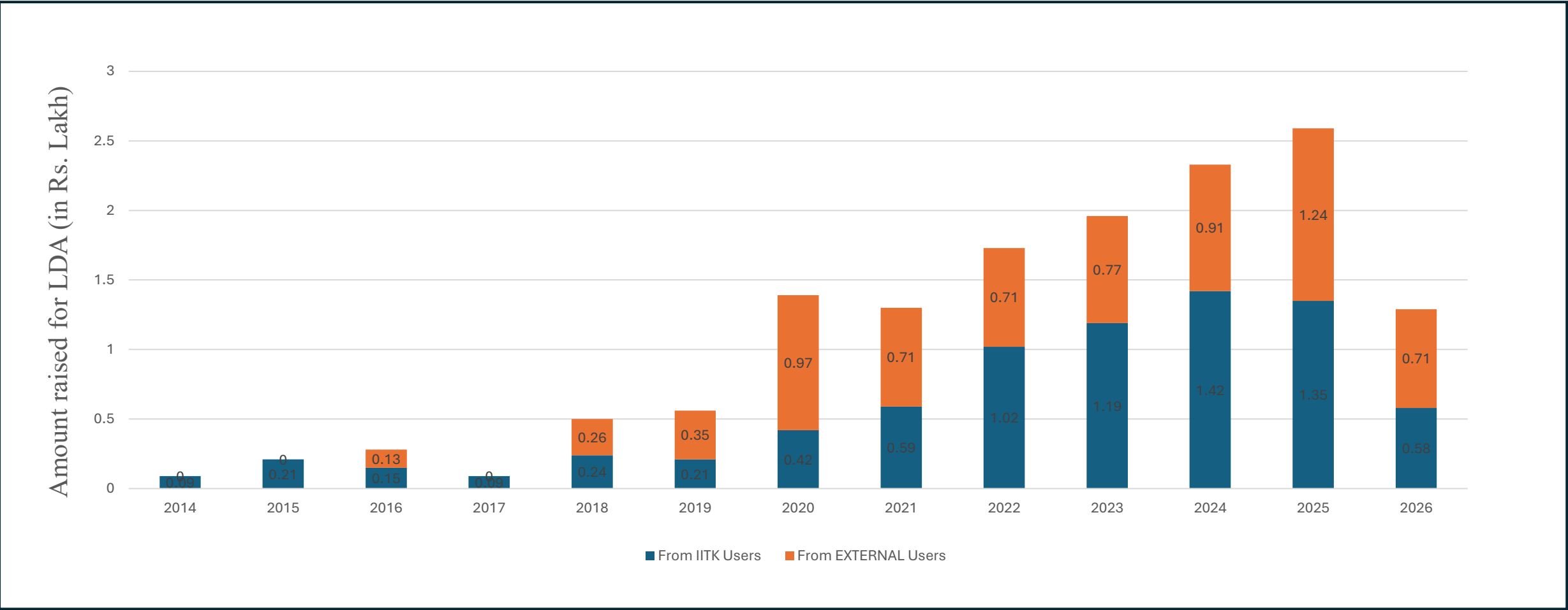
	BET Tests	Rates for IITK Users	Rates for External Users	
			(for Academia)	(for Industry)
1	One Sample (dry)	Rs 1000/sample + 7Ltr Liquid Nitrogen	Rs 2500/sample + 18% GST	Rs 5000/sample + 18% GST

Revenue Generated from **IITK (Internal) and Non-IITK (External) Users**

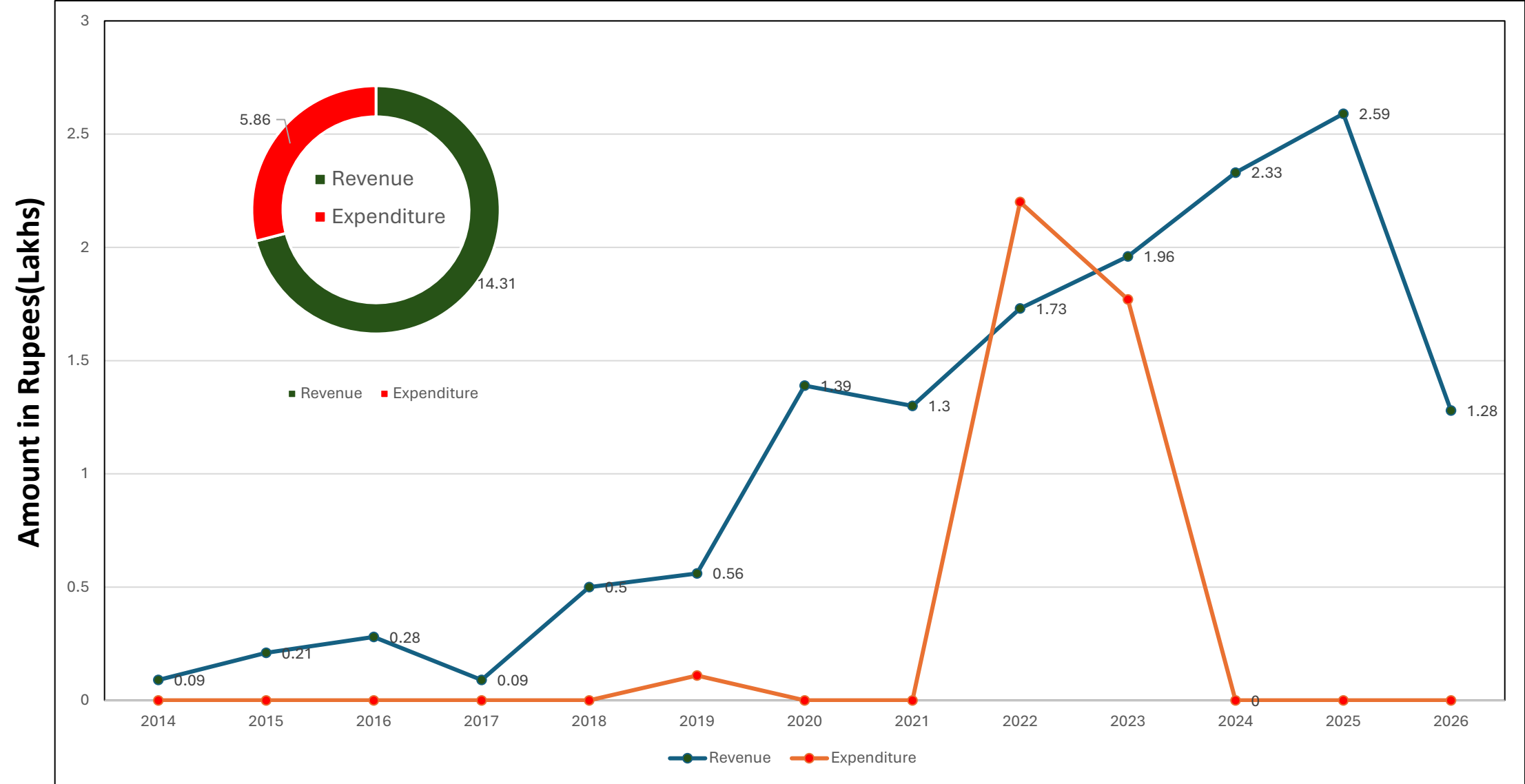
	<i>Revenue Generated Through User Charges (in Lakh Rs)</i>		
	Internal Users	External Users	
Fiscal Year	IITK Users to LDA	Testing Amount (inc. Tax)	Total Revenue (towards LDA)
2014	0.09	0.00	0.09
2015	0.21	0.00	0.21
2016	0.15	0.13	0.28
2017	0.09	0.00	0.09
2018	0.24	0.26	0.5
2019	0.21	0.35	0.56
2020	0.42	0.97	1.39
2021	0.59	0.71	1.3
2022	1.02	0.71	1.73
2023	1.19	0.77	1.96
2024	1.42	0.91	2.33
2025	1.35	1.24	2.59
2026	0.58	0.72	1.28
Total	7.54	6.75	14.29 Lakhs

Since 2014 a total revenue of around Rs. 14.29 Lakhs towards Lab Development Account (LDA) has been generated. Around Rs. 6.8 Lakh is shared with R&D from the testing fee collected from External Users.

Revenue Generated from IITK (Internal) and Non-IITK (External) Users



Revenue Generated (from User Charges) versus Expenditure (in Maintenance and Repair)



Lab & Maintenance Expenditure of TPL Equipments in ACMS

Fiscal Year	Description	From LDA	From ACMS budget	Institute Special Grant
2015-2016			-	-
			-	-
			-	-
Sub-Total			Nil	Nil
2016-2017			-	-
			-	-
Sub Total			Nil	Nil
2017-2018			-	-
			-	-
			-	-
Sub Total			Nil	Nil
2018-2019	Consumables		11563	-
			-	-
				-
Sub Total			11563	Nil
2019-2020				-
				-
				-
				-
Sub Total				Nil
2020-2021			-	-
			-	-
			-	-
Sub Total			Nil	Nil

Lab & Maintenance Expenditure of TPL Equipments in ACMS

FY	Description	From LDA	From ACMS budget	Institute Special Grant
2021-2022	Spare Parts	-	220287	-
		-	-	-
		-	-	-
		-	-	
Sub Total			220287	Nil
2022-2023	AMC	-	177000	-
		-	-	-
		-	-	-
		-	-	-
		-	-	-
Sub Total			177000	Nil
2023-2024			-	-
			-	
Sub Total			Nil	Nil
2024-2025				
2025-2026 (Till July 2026)			Nil	Nil
Sub Total			Nil	Nil
Grand Total			Rs. 397287	Nil

Key External Users of MTL Facility at ACMS from Academia, R&D organizations and Industries

Academic Institutes

- M.G.University Kottayam Kerala
- S.V. University Tirupathi
- IIT Roorkee
- Aligarh Muslim University
- Amity University Haryana
- IISER Mohapur Nadia Kolkata
- IIT Delhi
- Lucknow University
- Shiv Nadar University
- Guru Govind Singh Indraprastha University
- VNIT Nagpur
- UPTTI, Kanpur
- NIT Kurukshetra
- PPN college Kanpur
- Delhi technological university
- RGIPT JAIS Amethi
- Bipin Bihari College Jhansi
- IIT (ISM) Dhanbad
- Delhi University
- Jadavpur university
- BBA University Lucknow
- IIT Indore
- AVVM Sri Pushpam College
- IEST Shibpur
- Chandigarh college of Pharmacy Mohali
- NCU Haryana
- University of Baroda Vadodara
- St. Teresa's College Kochi
- NIT Jalandhar
- Jamia Millia Islamia New Delhi
- IIT Madras
- IIT Kharagpur
- NIT Silchar
- Lucknow university
- VNIT Nagpur
- PDEU Gandhinagar
- MSU Baroda
- Integral University
- Bodoland University Assam
- HBTU Kanpur
- ANDUAT Ayodhya UP
- IIPE Visakhapatnam

•AND MANY MORE...

Industries & R&D Organisations

- DMSRDE Kanpur
- Höganäs India Pvt. Ltd. Pune
- Arvind Mills Gujrat
- CSIR-NBRI

• AND MANY MORE...

Overall Assessment of TPL Facilities at ACMS

CAPABILITY:

1. The facility supports surface area and pore size analysis mainly through nitrogen adsorption. The system is capable to perform automatic single-point and multi-point BET surface area, Langmuir surface area, full adsorption and desorption isotherms, and pore size and pore volume distribution etc.,
2. Well trained staffs capable enough to handle modern instrumentation and software.

LIMITATIONS:

1. The BET analysis relies on precision sample cells, which are expensive consumable components typically 2-3 cells require replacement annually, contributing to operation costs.
2. Simultaneous use of degassing port and analysis is not applicable.
3. Sample should be dry non-volatile solid materials, liquid, semi-liquid or slurry-type samples are not compatible with the BET measurement procedure.

SCOPE:

1. Enhancement of sample degassing through additional degassing stations to improve throughput.
2. NABL Accreditation to make the lab a more reliable in terms of data.



Advanced Centre for Materials Science Indian Institute of Technology Kanpur

Usage Statistics and Fiscal Status Report

Magnetics Lab (ML)

(Room # 105, ACMS)

Prof. Anish Upadhyaya
(Head, ACMS)

Prof. Satyajit Banerjee
(Faculty In-Charge, ML Facility)

Mr. M Siva Kumar
(Sr. Tech. Supdt. and Staff In-Charge)

Mr. Prashant Shukla
(Jr. Tech. Supdt.)



Vibrating Sample Magnetometer

Features

- VSM supports all known types of magnetic measurements such as Hysteresis and minor loops, IRM and DCD Remanence Loops as well as Angular and AC Remanence Loops, Temperature scans and Time decay measurements
- This VSM system offers a dynamic field resolution whereby the field resolution switches, during the measurement, to the best available for the given field range.
- Unique sample vibrating mechanism makes sample mounting and alignment fast and convenient. Samples can quickly and easily be aligned properly to maximize the measurement accuracy and repeatability.



SQUID Magnetometer
Model/Supplier: S700X;Cryogenic Limited

Features

- Superconducting Magnet to 7 tesla
- 10^{-8} EMU sensitivity for total moment
- Continuous operation from 400 K down to 1.6 K
- Variable Temperature Sample Space of 9 mm with He-4 Gas
- Linear motor facility
- milli Tesla field resolution
- Electronics Rack
- LabVIEW operating software
- Fast sample change
- Full environmental shielding

Yearly Summary of Number of Samples tested and No. of hours utilized

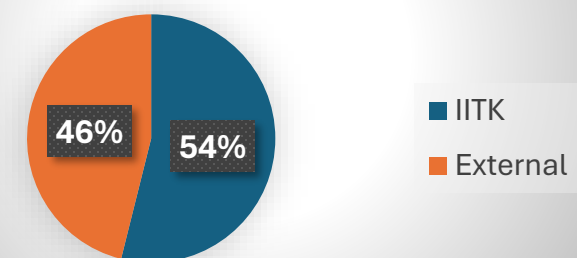
Year	No. of Samples tested	Utilization hours
2016	127	70
2017	156	86
2018	214	118
2019	402	221
2020	200	110
2021	240	132
2022	319	176
2023	279	154
2024	326	180
2025	384	211
Up to July 2026	186	103
Total:	2833	1561

Total 2833 samples tested and 1561 hours utilized for test

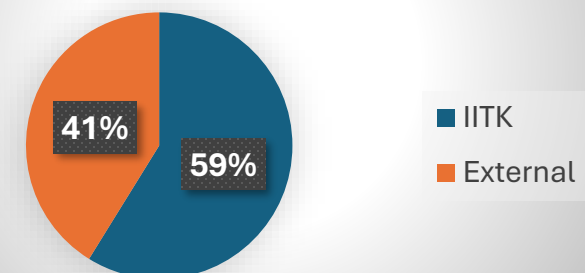
Usage Statistics of Magnetism Lab by IITK(Internal) and Non IITK(External) Users

Year	IITK Users		External Users	
	Samples	Hours	Samples	Hours
2016	83	46	44	20
2017	33	18	123	55
2018	119	65	95	43
2019	137	75	265	119
2020	91	50	109	49
2021	166	91	74	33
2022	241	133	78	35
2023	150	83	129	58
2024	201	111	125	56
2025	183	101	201	90
Up to July 2026				
	123	68	63	28
Total:	1527	840	1306	588

No. of samples tested



No. of Hours Utilized



Major Non-IITK users

- **DMSRDE, Kanpur**
- **HBTI, Kanpur**
- **BIET, Jhansi**
- **MNIT, Jaipur**
- **IITP, Patna**
- **Jivaji Univ, Gwalior**
- **MNNIT, Allahabad**
- **IIT – ISM Dhanbaad**
- **NIT Srinagar**
- **NIT Agartalla**
- **NIT Raipur**
- **Kanpur University**
- **CSIR CHANDIGARH**
- **IIT JODHPUR**
- **IIT DELHI**
- **ANDHRA UNIVERSITY**
- **MADRAS UNIVERSITY**
- **MANIT BHOPAL**
- **IIT- BOMBAY**
- **ITM- GIDA GORAKHPUR**
- **DEI- AGRA**
- **SVNIT SURAT**
- **TERI University**
- **Punjab Technical University**
- **ITMD Jabalpur**
- **IIT Jammu**
- **Sikkim Mannipal University**
- **SLIET, Punjab**
- **MKU Limited**
- **IIIT JABALPUR**
- **NIT JAIPUR**
- **IIARAM-AHEMADABAD**
- **KARNATAKA UNIVERSITY**



Advanced Centre for Materials Science Indian Institute of Technology Kanpur

Usage Statistics and Fiscal Status Report *of* Electrical Characterization Facility @ ACMS (ECF, Room # 201, ACMS)

Dr. Anish Upadhyaya

(Head, ACMS)

Dr. Shobit Omar

(Faculty In-charge, ECF)

Mr. Pushpendra Kumar

(Senior Technician, ACMS ECF Staff In-charge)

Mr. Ashutosh Yadav

(Junior Technician, ACMS ECF)

Summary Outlines of ACMS Electrical Characterization Facility(ECF)

- Total **12 different dedicated test facilities comprising 12 equipment's** are installed in the Electrical Characterization Facility(ECF) at ACMS.
- ECF is equipped to perform more than **10 types of electrical tests**.
- Over **5037 Samples** have been tested so far between 2015 to 2026 at ECF.
- Total **14115 Hours** of equipment usage time utilized in conducting various Electrical Tests.
- **15% of total users** are **External** (including National and Regional Academic Institutions ; R&D Organisation; and Industries).
- Faculty, Research Scholars and Students from **9 Departments and Centers at IIT Kanpur** have utilized ECF facilities since its installation in 2015.
- A total revenue of around **Rs 3.74 Lakh generated and contributed to LDA of ECF** till date. ECF has also contributed **Rs. 3.44 Thousand to R&D** from the testing amount collected from External Users.
- The facility has operated in **self-sustained mode** and met **~18%** of its expenditures through LDA and balance **82%** from ACMS Budget. After taking into consideration, expenditures incurred for upgradation, maintenance and repairs, ECF **LDA has still has balance of Rs 3.01 Lakhs as on 30.07.2026**.

Major Facilities *under* Electrical Characterization Facility (ECF)

	Instrument Name	Manufacturer	Model	Capacity	Additional Setup	Standard Testing	Year of Installation	Purchase Cost	
								Purchase	INR - Lakh
1	Probe Station with Heating Stage	Signatone	S – 1160X – 6N	- Heating Facility up to ambient to 300° C - Thermal Controller Capacity: Min 12° C to Max 20° C	- Recirculating chiller for cooling of station - Motic stereo zoom-microscope	I-V/C-V measurements	2014	73446.00 USD	45. 7
2	Probe Station with Cooling Stage	Advanced Research Systems	PSF – 1 - 4	- Temperature range 10K – 300K	- ARS 4HW Compressor	I-V/C-V measurements	2014	95418.00 USD	59.4
3	Hall Effect Measurement System	ECOPIA	HMS – 5000 / AMP55T	INPUT CURRENT - 1 nA to 20 mA RESISTIVITY - 10 ⁻⁴ to 10 ⁷ ohm cm CARRIES CONCENTRATION - 10 ⁷ to 10 ²¹ MOBILITY - 1 to 10 ⁷ cm ² / volt.sec MAGNETO FLUX DENSITY {Tesla} - 0.55 Tesla only	N/A	- Bulk Concentration - Sheet Concentration - Sheet Resistance - Resistivity - Conductivity - Magnetoresistance - Mobility - Avg. Hall Coefficient	2014	36638.50 USD	22.8
4	Sheet Resistivity Measurement System (Pro-4)	Lucas / Signatone	Pro4 – 440N	Depending on Source Meter	SOURCE METER – SCS 4200	- Resistivity measurements of the sheet and bulk samples. - Quick measurement of sheet resistance of thin-films, semiconductor wafer.	2014	11263.00 USD	7
5	Oscilloscope	TEKTRONIX	DPO4102B-L	-	-	-	2014	-	3.1
6	High Temperature Probostat	ELITE	TSVH12	- Max. Furnace Temperature: RT to 1200°C	-Vertical Split Tube Furnace - Single zone		2014	-	6.5
7	Impedance Analyzer	AMETEK	1260A	-Frequency Range - 5 uHz to 32 MHz			2014	23975 GBP	24
8.	LCR	HIOKI	3532 - 50	-Frequency Range - 5 MHz to 42 Hz			2014	533699 JPY	3
9.	Thermoelectric Characterization System	ULVAC-RICO	ZEM-3M10	50° C to 1000° C (M10 type)		Seebeck coefficient: - Static dc method Electric resistance: - Four-Terminal method	2014	10298100 YEN	59.4
10.	Piezo-Electric, Ferro-Electric, Pyro-Electric Materials Characterization	AIXACT	TF - 3000	<u>For pellets</u> 10mHz to 1kHz 13 V to 9.95 kV <u>For thin films</u> 10mHz to 1kHz 13 to 995 V	-	-Hysteresis measurement -PUND measurement -Fatigue measurement -Retention measurement -Static hysteresis measurement -Imprint measurement -Leakage current measurement	2014	86277 EURO	69.9
11.	Closed Cycle Cryostat with Electro-Magnet	ARS	CS204AE-FMX—1AL (DE – 204AE)		GMW 5403 Electromagnet Magnetic Field strength = 0.6 T	I-V/C-V measurements @ Low Temperature	2014	-	1.3
12.	Plasma Sputter Coater	MTI CORPORATION	GSL-1100X-SPC-12		TARGET (4N purity Gold foil) - 57 mm dia. x 0.12 mm		2014	9288 USD	5.7
13.	Near Field Scanning Optical Microscope (NSOM)	NANONICS	MULTIVIEW 4000	-Direct mapping of photocurrent for solar cell. -Imaging optoelectronic devices and films. -Single-molecule spectroscopy and imaging -Surface plasma plovitons for chemical and bio sensing devices -Crystallographic defects at the nano meter scale	MODES OF OPERATION -Reflection NSOM -Collection Mode -Transmission mode -Apertureless NSOM	-	2014	268683 EURO	218
								TOTAL	526 appx.

ELECTRICAL CHARACTERIZATION FACILITY – 201

Name of the Equipment		Company	Model Number	For more details click below
1.	CRYOGENIC PROBE STATION	Adv. Research Systems, Inc.	PSF-10-1-4	http://www.arscryo.com/CS204_F-PS-2-4.html
2.	PROBE STATION WITH HEATING STAGE	SIGNATONE	S-1160 SERIES PROBE STATION	http://www.signatone.com/products/probestations/s1160_probe.asp
3.	SEMICONDUCTOR PARAMETER ANALYZER	KEITHLEY	4200-SCS	http://www.tek.com/search/apachesolr_search/4200-scs
4.	DIGITAL PHOSPHOR OSCILLOSCOPE	TEKTRONICS	DPO4102B-L	http://www.testequity.com/products/4469/
5.	HALL EFFECT MEASUREMENT SYSTEM	ECOPIA	HMS - 5000	http://four-point-probes.com/ecopia-hall-effect-measurement-system/
6.	SHEET RESISTANCE MEASUREMENT SYSTEM	SIGNATONE	Pro4-440N	http://www.signatone.com/applications/pro_4.asp
7.	THERMOELECTRIC CHARACTERIZATION SYSTEM	ULVAC-RICO	ZEM-3M10 with high resistance	http://www.ulvac.com/vacuum-pumps-components/system.cfm?cid=48&scid=82&sid=56
8.	PIEZO, PYRO & FERRO ELECTRICAL MATERIAL CHARACTERIZATION	AIXACCT SYSTEMS GMBH	TF-ANALYZER-2000HS	http://www.aixacct.com/
9.	CLOSED CYCLE CRYOSTAT WITH ELECTRO-MAGNET	☆ Adv. Research Systems, Inc. ☆ CRYOCOOLER	☆ CS204AE-FMX-1AL ☆ DE-204AE	http://www.arscryo.com/CS202_I-DMX-1SS.html
10.	PLASMA SPUTTER COATER	MTI CORPORATION	GSL-1100X-SPC12	http://www.mtixtl.com/desk-topplasma-sputtering-coater-for-metallic-coating-with-vacuum-pump-and-gold-target-15max-sample.aspx
11.	NEAR FIELD SCANNING OPTICAL MICROSCOPE	NANONICS IMAGING LTD.	MultiView 4000 system	http://www.nanonics.co.il/products/multiview-4000-system#online-integrations
12.	IMPEDANCE ANALYZER	SOLARTRON ANALYTICAL	1260A with Smart Software	http://www.ameteksi.com/products/frequency-response-analyzers/1260a-impedance-analyzer http://www.norecs.com/
13.	LCR METER	HIOKI EE CORPORATION	Hioki 3532-50 LCR HI Tester	http://www.testequipmentdepot.com/hioki/lcrmeters/352250_353250.htm

Specifications of Instruments housed-in Electrical Characterization Facility - 201

Probe Station with Heating Stage



Application:

Platform for measurement of electrical characteristics of various materials, and devices using Keithley Semiconductor Parameter analyzer, from ambient to 300°C with no electrical or optical disturbance. This probe station is used to measurement results for I-V/C-V measurements.

Capability:

- Heating Facility up to ambient to 300° C
- Thermal Controller Capacity: Minimum 12° C to Maximum 20° C
- Four micromanipulators with triaxial cables.
- Two micromanipulators with triaxial cables.
- Maximum sample size 12.7 mm × 12.7 mm
- Provision for chuck bias

Probe Station with Cooling Stage



Application:

Platform for measurement of electrical characteristics of various materials, and devices using Keithley Semiconductor Parameter analyzer, from 10 K to 350 K with no electrical or optical disturbance. This probe station is used to measurement results for I-V/C-V measurements.

Capability:

- Temperature range 10K – 300K
- Four micromanipulators with triaxial cables.
- Maximum sample size 1 inch × 1 inch

Hall Effect Measurement System



About the Instrument:

This system is consisting of three parts HMS – 5000 CONTROLLER, MAGNET KIT & TEMPERATURE CONTROLLING SYSTEM AND DISPLAY

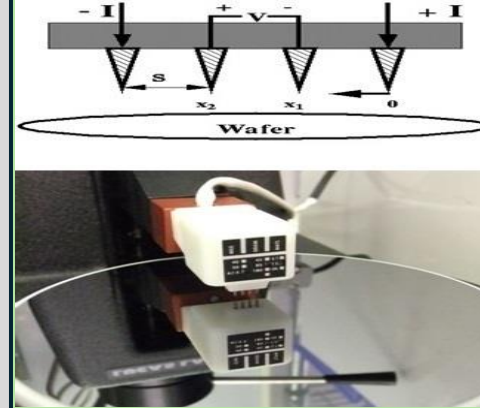
HMS-5000 CONTROLLER: - Constant current source and Van der Pauw method terminal

Magnet kit & temperature controlling system: - 0.55 Tesla permanent magnet (+/- 0.03 Tesla), Conductive sample mounting board
Display: - PC for software use and display for results.

Measurement Capability:

Bulk Concentration, Sheet Concentration, Sheet Resistance, Resistivity, Conductivity, Magneto-Resistance, Mobility, Average Hall Coefficient, A-C Hall Coefficient, B-D Hall Coefficient, Ratio Of Vertical/Horizontal

Sheet Resistivity (Pro-4)



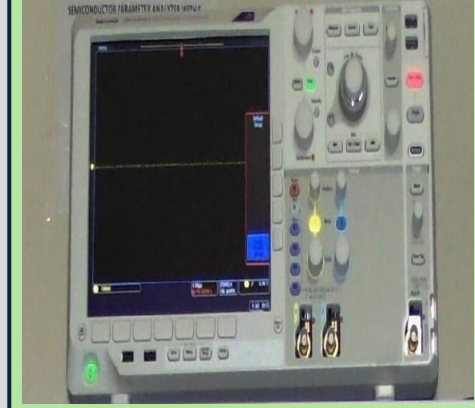
Measurements:

- The resistivity measurements of the sheet and bulk samples.
- Quick measurement of sheet resistance of thin-films, semiconductor wafer.

Principle:

Four probe method for measuring resistance is also known as Four-terminal sensing or 4T sensing. It is a technique to measure electrical impedance. It uses separate pairs for current carrying and voltage sensing electrodes. This method is capable of making more accurate measurements than two terminal sensing. In this method, current is supplied via a pair of current leads. The voltage drop across the impedance is measured by a separate pair of leads. Thus, the voltage drops in the current carrying wires is prevented from being added to the actual value.

Oscilloscope

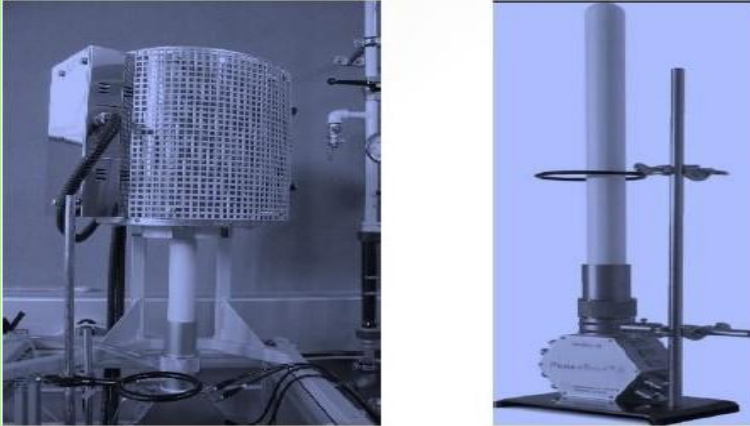


Key performance specifications

- 1 GHz, 500 MHz, 350 MHz, and 100 MHz bandwidth models
- 2 and 4 analogue channel models
- Up to 5 GS/s sample rate on all channels
- Up to 20 mega-point record length on all channels
- >50,000 wfm/s maximum waveform capture rate
- Standard passive voltage probes with less than 4 pF capacitive loading and 500 MHz or 1 GHz analogue bandwidth
- Suite of advanced triggers

to be contd..

High Temperature Probostat



About:

- Outer tube diameter: 40 mm
- Overall length: 75 cm, shorter versions available (-10, -20, -30 cm)
- Single end cell assembly
- Sample fixation: spring force via alumina rods
- All hot-zone electrode leads detachable via feed through mini-connectors
- Support tube systems from 10 to 24 mm diameter detachable
- For up to 24 mm diameter disk samples
- For up to 50 mm long bar samples
- Temperature: typical long term: < 1400°C, short term: < 1600°C

Features:

- Conductivity vs. T, pO₂, pH₂O etc.
- DC, AC impedance spectroscopy
- Dielectric properties loss etc.
- 2 and 4 electrodes
- Ionic transport number
- I-V characteristics
- Fuel cell components (Electrolyte, Anode/Cathode) and single cell testing
- Standard materials: Alumina AL23, Pt, Pt10%Rh, Ni-plated brass

Impedance Analyzer



Applications: (1260A)

- Corrosion studies
- Battery research and fuel cells
- Solar cells
- LCDs
- Biomaterials
- Ceramics / composites
- Electronic component development
- Civil engineering

Features:

Wide frequency range:

Spanning 10 μ Hz to 32 MHz with 0.015ppm resolution, this analyzer provides excellent coverage for virtually all chemical and molecular mechanisms.

Noise free analysis:

- Frequency resolution: 1 in 65 million (0.015 ppm)
- 0.1%, 0.1° accuracy
- Resolution to 0.001 dB, 0.01°
- Measures impedances >100 M Ω
- 2-, 3- and 4- terminal measurement configurations
- Polarization voltage up to $\pm$ 40.95 V

LCR



Measurement Capabilities:

- Fourteen parameters can be measured- |Z|, |Y|, θ , R_p, R_s, G, X, B, L_p, L_s, C_p, C_s, D (tan δ) and Q
- Inductance of winding, floating capacitance
- Characteristics at operating frequency and low frequency resistance components
- Four simultaneous measurement parameters at a time
- Inductance (L) and DC resistance (DCR) can be measured by the same unit

Features:

- High frequency range (42 Hz to 5 MHz)
- High resolution and high accuracy ($\pm$ 0.08%)
- Fastest measurement time 5 ms
- Interactive touch panel operation
- Can be interfaced with the computer

Thermoelectric Characterization System



MAKE: ULVAC-RICO
MODEL: ZEM-3M10

Thermoelectric characterization system for bulk and thin film samples

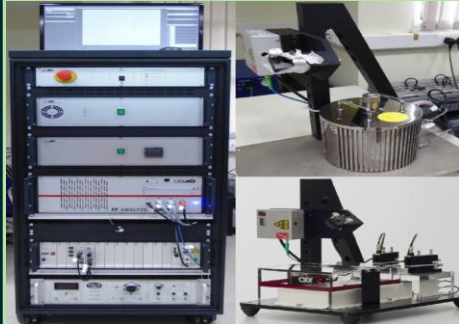
Temperature Capability:

Thermoelectric characteristic evaluation of a wide range of materials from 50°C to 1000°C under helium gas ambient

Type and dimensions of samples allowed:

1. Pellet with radially two ends polished flat as shown in the schematic below.
2. Rectangular bar
*For case (1.) and (2.) the surface of sample making contact with the electrodes would be in between 2x2 to 4x4 mm². The distance between the two electrodes could be in the range of 5 to 22 mm only.
3. Cylindrical bar: - The diameter could be in the 2 - 4 mm range and the length should be in the range of 5 to 22 mm only.
4. Thin-film: - Use the special holder that has been provided for this purpose.

Piezo-Electric, Ferro-Electric, Pyro-Electric Materials Characterization



Measurement Variables:

- 1 For piezo sample holder unit:
 - 1.1 Sample diameter: 3 mm to 25 mm
 - 1.2 Sample thickness: 0.1 mm to 5 mm
 - 1.3 Internal heater temperature range: 20 degree Celcius to 800 degree Celcius
 - 1.4 Use of silicon oil possible to increase the flash-over voltage.
- 2 For thin film sample holder unit:
 - 2.1 Maximum sample size allowed: 25 mm x 25 mm
 - 2.2 Sample thickness: 0.1 mm to 10 mm
 - 2.3 temperature range: 20 degree Celciusto 250 degree Celcius

MEASUREMENT:

- * DHM - Dynamic Hysteresis Measurement
- * PM - Pulse Measurement
- * SHM - Static Hysteresis Measurement
- * LM - Leakage Current Measurement
- * FM - Fatigue Measurement
- * RM - Retention Measurement
- * IM - Imprint Measurement

Closed Cycle Cryostat with Electro-Magnet



INSTRUMENT:
Advanced Research Systems (ARS) closed cycle cryostat

CS202A1-DMX-1SS with GMW 5403 Electromagnet Magnetic Field strength = 0.6 T

Measurement:

- Magneto resistance measurement/Hall effect measurement
- Hall measurements from 10K to 800K.
- Magnetic field strength = 0.6T

Plasma Sputter Coater



GSL-1100X-SPC12 is a compact plasma sputtering coater designed for making metallic coatings, such as gold, platinum, Indium and silver etc which can be applied on a sample up to 40 mm diameter with 300 Angstrom thickness.

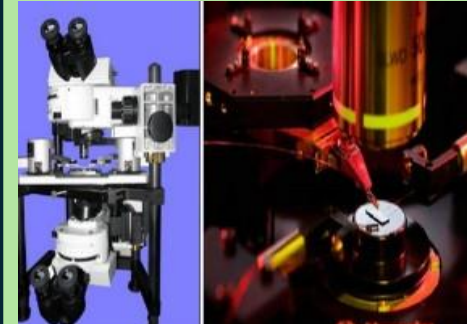
TARGET:

4N purity Gold foil: 57 mm dia. x 0.12 mm

Application Notes:

- For the best film strength, please use plasma cleaner to clean sample before coating.
- Conductive gold film on the sample after 10s processing
- The system requires an Ar gas tank with pressure regulator which is not included
- This model is not suitable for coating light weight metallic material such as Al, Mg and Zinc or Carbon target due to low energy.

Near Field Scanning Optical Microscope (NSOM)



Mode of Operations:

- Near-field scanning optical microscopy
- Reflection NSOM (NSOM) is a microscopy technique to probe
- Collection Mode nanostructures with resolution of 10-20 nm
- Transmission Mode in lateral dimensions and 2-5 nm in vertical dimensions.
- Apertureless NSOM
- Near-field Illumination & Near-field Scattering and/or Collection with Multiple AFM/NSOM probes

Special Features:

- Multimodal NSOM provides unique opportunity to conduct simultaneously various electrical and optical characterizations for nano structured materials like nanowires, nano-particles etc.
- Direct mapping of photocurrent for solar cell Imaging optoelectronic devices & films: A combination of emission and bias modulation for LED and photovoltaic devices.
- Single-Molecule Spectroscopy (SMS) and Imaging
- Surface plasmon polaritons for chemical and bio sensing devices.
- Crystallographic defects at the nanometer scale

Yearly Summary Table of Number of Samples Tested by Each Instrument

No. of Samples Tested by Specific Instrument in Electrical Characterization Facility

No. of Samples Tested by Specific Instrument in Electrical Characterization Facility										
Year	LCR Meter	Probostat	Solartron	Hall Effect	Semiconduct. P.A.	PRO-4	Piezo Pyro	Thermoelectric	Sputter Coating	Total
2015	—	—	—	16	46	—	29	—	—	91
2016	—	—	—	83	293	—	62	—	—	438
2017	—	—	—	181	204	—	129	—	—	514
2018	—	—	—	128	133	2	166	—	—	429
2019	24	113	283	218	128	—	6	—	—	772
2020	20	26	5	40	42	—	0	6	48	187
2021	7	46	95	144	238	—	3	92	42	667
2022	34	56	31	141	187	—	27	40	9	525
2023	60	39	39	183	64	56	*	61	51	553
2024	19	33	16	87	47	47	2	54	130	435
2025	18	—	12	125	*	*	*	37	28	220
2026	0	—	29	119	*	*	*	26	32	206
Total	182	313	510	1465	1382	105	424	316	340	5037

**Instrument was down during specific period*

Total 5037 Samples analysed at Electrical Characterization Lab in ACMS-ECF Lab since 2014

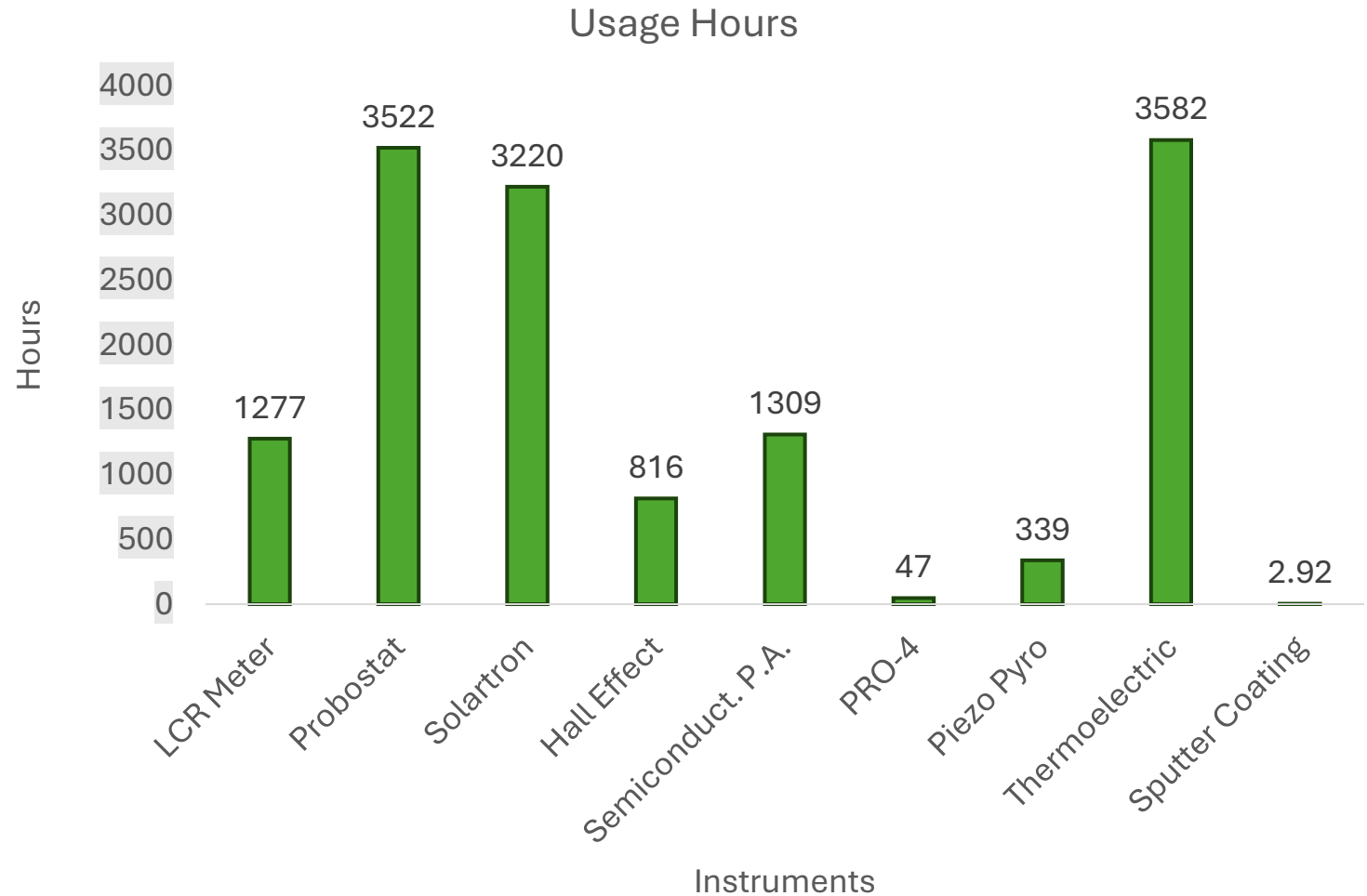
Yearly Summary Table of Usage Time in Hours by Specific Instrument

Usage Time in (Hours) by Specific Instrument in Electrical Characterization Facility										
Year	LCR Meter	Probostat	Solartron	Hall Effect	Semiconduct. P.A.	PRO-4	Piezo Pyro	Thermoelectric	Sputter Coating	Total
2015	–	–	–	7	85	–	19	–	–	111
2016	–	–	–	37	334	–	31	–	–	402
2017	–	–	–	76	255	–	98	–	–	429
2018	–	–	–	78	37	1	82	–	0.01	198
2019	224	1860	1723	135	120	–	12	–	1.00	4075
2020	36	106	45	21	16	–	0	134	0.29	358
2021	63	379	538	72	187	–	6	1067	0.25	2312
2022	289	452	249	95	172	–	88	539	0.05	1884
2023	380	428	254	65	65	27		623	0.35	1842
2024	171	297	144	51	38	19	3	429	0.45	1152
2025	114	–	78	87	–	–	–	483	0.25	762
2026	–	–	189	92	–	–	–	307	0.27	588
Total	1277	3522	3220	816	1309	47	339	3582	2.92	14115

***Total 14115 hours of operation on various instruments housed in ECF**

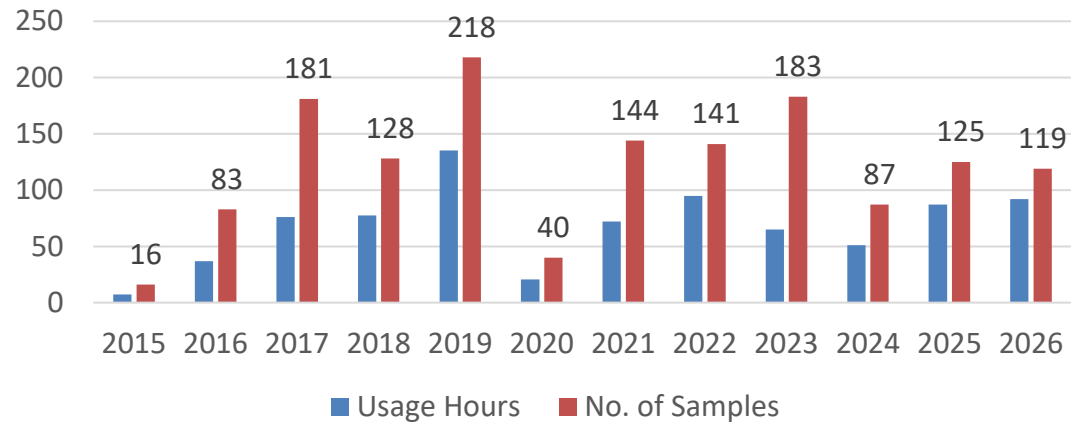
Graphical presentation of Total Usage of Instruments by Operational Hours

Instruments	Usage Hours
LCR Meter	1277
Probostat	3522
Solartron	3220
Hall Effect	816
Semiconduct. P.A.	1309
PRO-4	47
Piezo Pyro	339
Thermoelectric	3582
Sputter Coating	3
Grand Total	14115

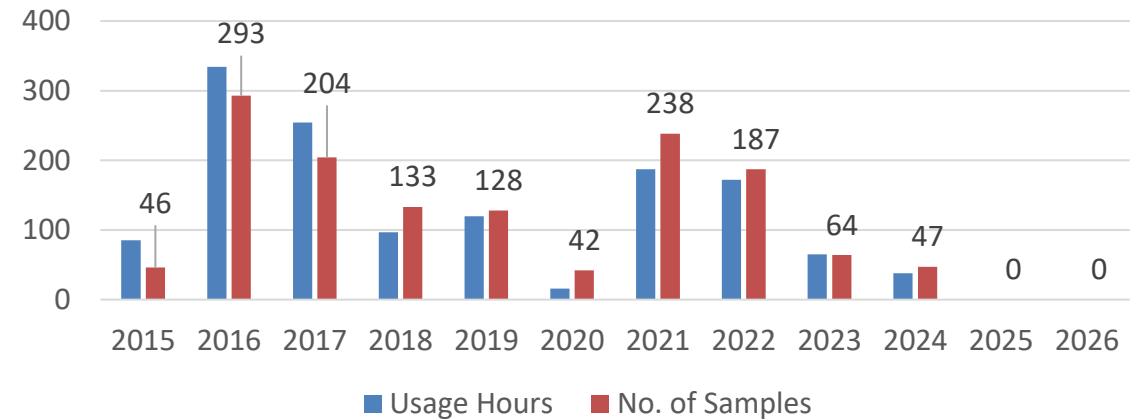


Year-to-Year Usage of Instruments *vis a vis* Number of Samples and Usage Time

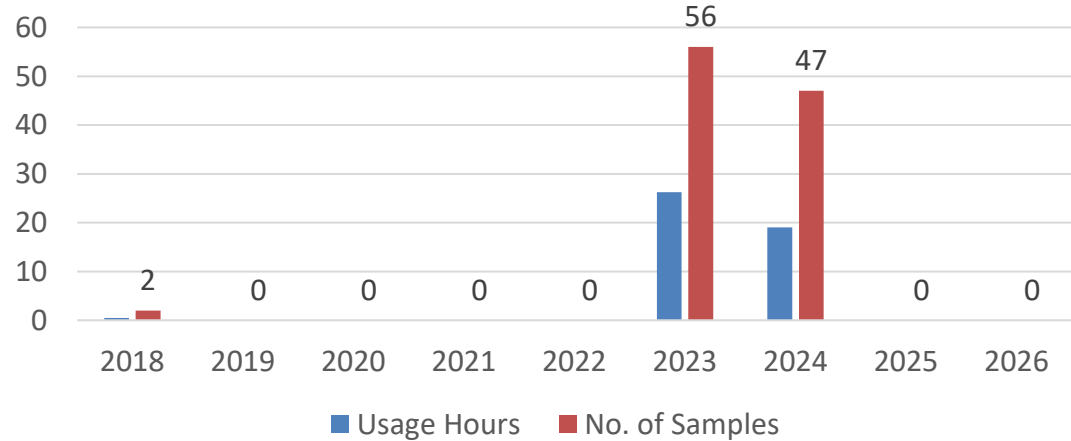
Yearly Utilization of Hall Effect Measurement



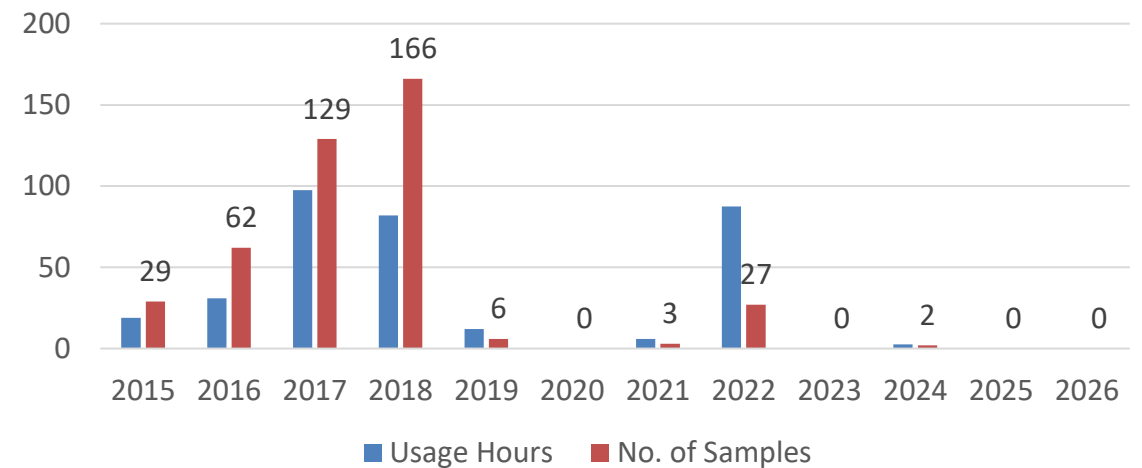
Yearly Utilization Semiconductor P.A.



Yearly Utilization Pro-4

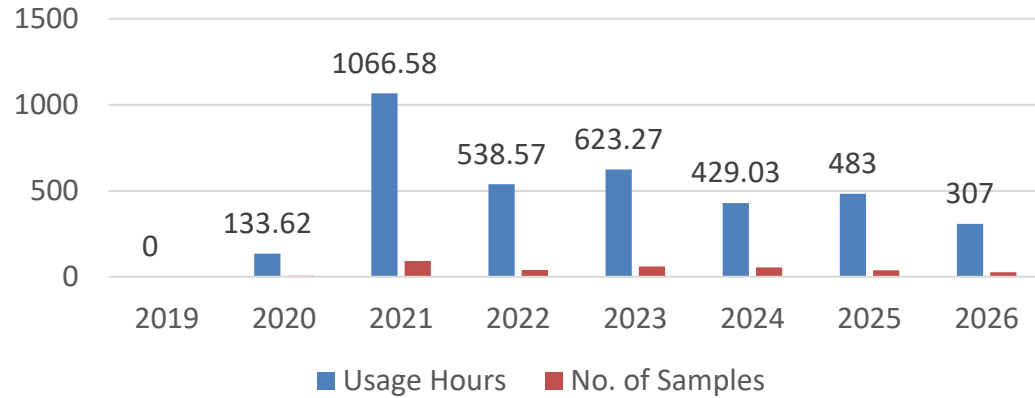


Yearly Utilization of Piezo/Pyro/Ferro

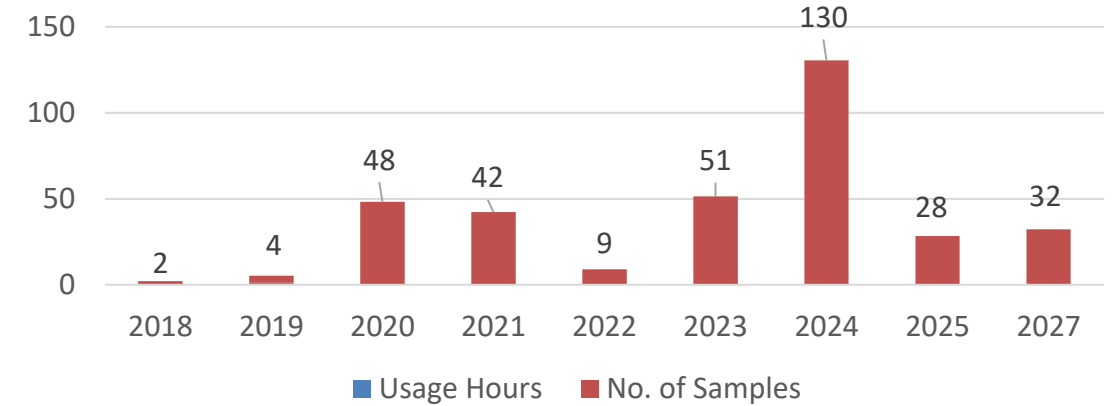


Year-to-Year Usage of Instruments *vis a vis* Number of Samples and Usage Time

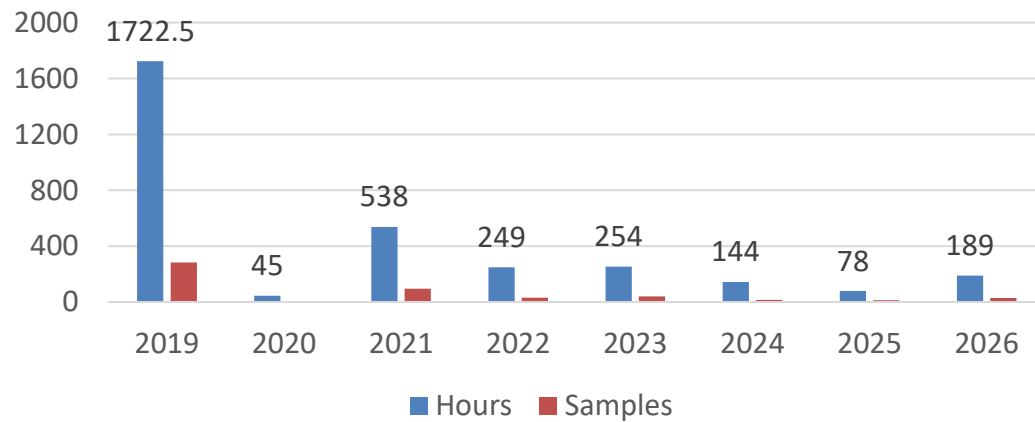
Yearly Utilization of Thermoelectric System



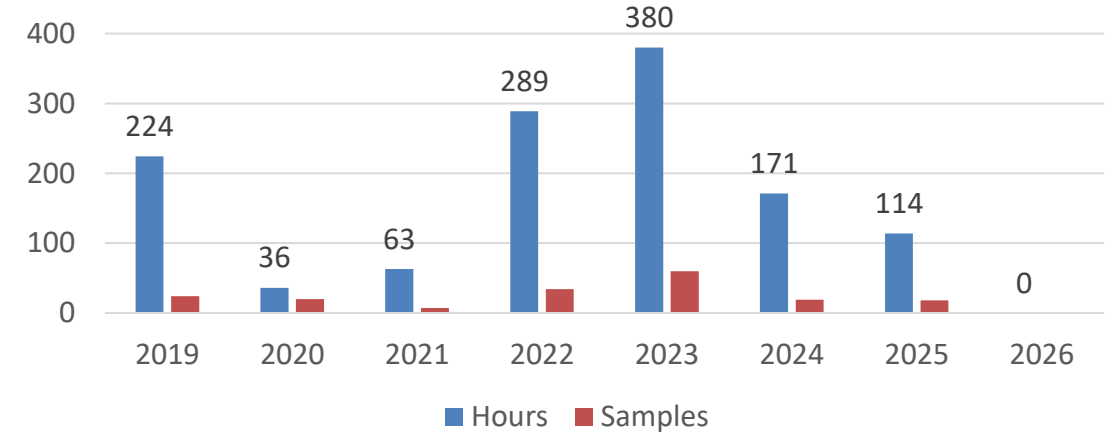
Yearly Utilization of Sputter Coating



Yearly Utilization of Solartron



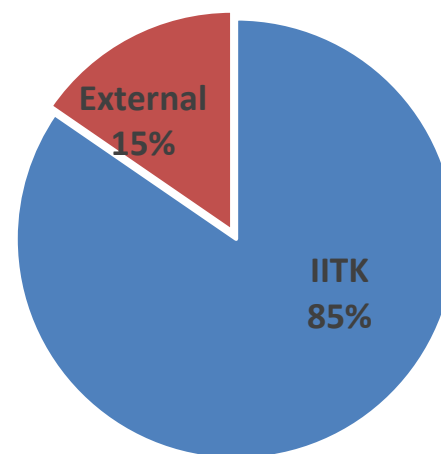
Yearly Utilization of LCR Meter



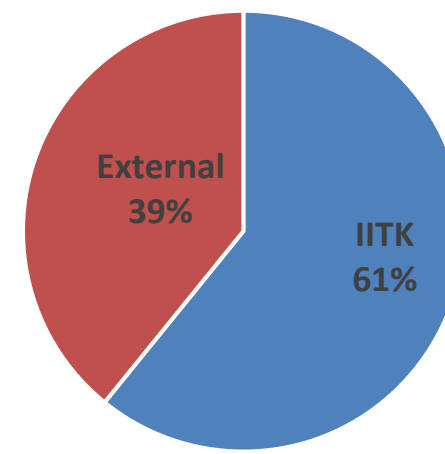
Usage Statistics of ECF Instruments by IITK (Internal) and Non-IITK (External) Users

Year	IITK Users		External Users	
	Samples	Hours	Samples	Hours
2015	91	112	0	0
2016	438	402	28	88
2017	514	628	23	25
2018	429	257	78	7
2019	388	668	119	736
2020	136	171	51	150
2021	605	1332	62	930
2022	434	993	90	955
2023	507	1280	96	830
2024	417	1340	75	1161
2025	163	541	57	221
2026	144	336	62	252
Total	4266	7660	761	6501

Total Number of Samples Tested: 5037



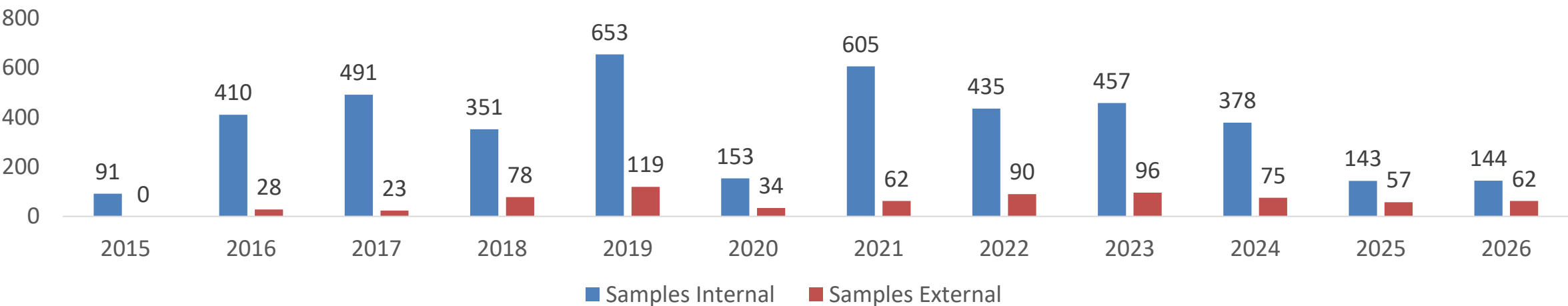
Total Usage Time: 14115 hrs



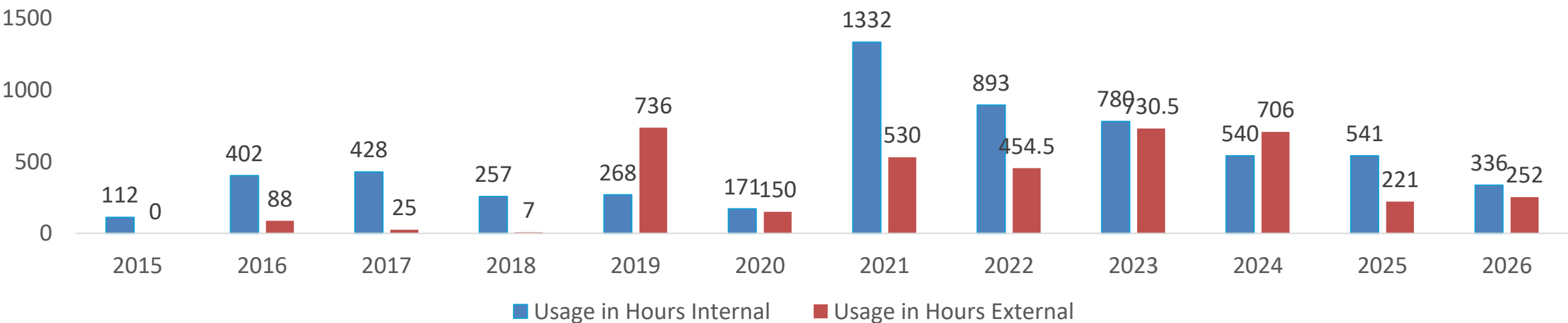
- **Total 5037 Samples** so far tested in ECF in over **9960 hrs** of usage of facilities.
- Out of total overall usage, **15% of samples** and **39% of usage time** is by **External Users**

Usage Statistics of ECF Instruments by **IITK (Internal)** and **Non-IITK (External)** Users

Overall Samples Tested by IITK vs External Users



Overall Usage Time from IITK vs External Users



Testing Charges for Facilities housed in Electrical Characterization Facility, ACMS

Note*: All service tax has to be changed as per GOI

S. No.	Instrument Name	Charges (In ₹) (For IIT Kanpur)	Charges (In ₹) (For academic Institutions and Govt. Research Labs)	Charges (In ₹) (Industry and Private Laboratories)
1.	Ambient to high temperature probe station [A]	₹ 200 per hour – Ambient condition ₹ 300 per hour – High temperature	₹ 400 per hour + 18% (G.S.T) (Both for ambient and high temperature)	₹ 800 per hour + 18% (G.S.T)
2.	Low temperature probe station [A] [B]	₹ 400 per hour ₹ 200 per sample	₹ 800 per hour + 18% (G.S.T) ₹ 400 per sample + 18% (G.S.T)	₹ 1600 per hour + 18% (G.S.T) ₹ 800 per sample + 18% (G.S.T)
3.	Hall Effect Measurement	₹ 300 per hour – Temperature dependent Temperature (300 K To 350 K)	₹ 500 per hour + 18% (G.S.T) – Temperature dependent Temperature (300 K To 350 K)	₹ 900 per hour + 18% (G.S.T) – Temperature dependent Temperature (300 K To 350 K)
4.	Sheet resistance measurement	₹ 100 per sample	₹ 200 per sample + 18% (G.S.T)	₹ 400 per sample + 18% (G.S.T)
5.	Oscilloscope	₹ 300 per hour	₹ 500 per hour + 18% (G.S.T)	₹ 1000 per hour + 18% (G.S.T)
6.	Thermoelectric Measurement System	Minimum slot of 3 hours. For first 3 hours: ₹ 300 Afterwards ₹ 100 per hour	Minimum slot of 3 hours. For first 3 hours: ₹ 600 + 18% (G.S.T.) Afterwards ₹ 200 + 18% (G.S.T.) per hour	Minimum slot of 3 hours. For first 3 hours: ₹ 1000 + 18% (G.S.T.) Afterwards ₹ 400 + 18% (G.S.T.) per hour
7.	Ferro/Piezo/Pyro electric measurement system	₹ 200 per sample ₹ 300 per hour @ temperature dependent	₹ 400 per sample + 18% ₹ 500 per hour + 18% (G.S.T.) @ temperature dependent	₹ 800 per sample + 18% (G.S.T.) ₹ 900 per hour + 18% (G.S.T.) @ temperature dependent
8.	Cryostat along with the pole-magnet	₹ 200 per sample ₹ 300 per hour @ temperature dependent	₹ 400 per sample + 18% (G.S.T.) ₹ 500 per hour + 18% (G.S.T.) @ temperature dependent	₹ 800 per sample + 18% (G.S.T.) ₹ 900 per hour + 18% (G.S.T.) @ temperature dependent
9.	Sputter deposition system	₹ 300 per sample for sputter of 1 minute	₹ 500 per sample for sputter of 1 minute + 18% (G.S.T.)	₹ 800 per sample for sputter of 1 minute + 18% (G.S.T.)
10.	Solartron 1260	50 ₹ per hour	100 ₹ per hour (+ 18% G.S.T.).	500 ₹ per hour (+ 18% G.S.T.).
		One day's slot 300 ₹	One day's slot 600 ₹ (+ 18% G.S.T.)	One day's slot 3000 ₹ (+ 18% G.S.T.)
		Two day's slot 500 ₹	Two day's slot 1000 ₹ (+ 18% G.S.T.)	Two day's slot 5000 ₹ (+ 18% G.S.T.)
		One Week slot 1500 ₹	One Week slot 3000 ₹ (+ 18% G.S.T.)	One Week slot 15000 ₹ (+ 18% G.S.T.)
11.	Probostat 300-8000C Measurement	One day's slot 200 ₹	One day's slot 400 ₹ (+ 18% G.S.T.)	One day's slot 2000 ₹ (+ 18% G.S.T.)
		Two day's slot 300 ₹	Two day's slot 600 ₹ (+ 18% G.S.T.)	Two day's slot 3000 ₹ (+ 18% G.S.T.)
		One Week slot 900 ₹	One Week slot 1800 ₹ (+ 18% G.S.T.)	One Week slot 9000 ₹ (+ 18% G.S.T.)
12.	Probostat Room Temperature	30 ₹ per hour	120 ₹ per hour (+ 18% G.S.T.)	300 ₹ per hour (+ 18% G.S.T.)
13.	LCR Meter	30 ₹ per hour	120 ₹ per hour (+ 18% G.S.T.)	300 ₹ per hour (+ 18% G.S.T.)
		One day's slot 200 ₹	One day's slot 400 ₹ (+ 18% G.S.T.)	One day's slot 4000 ₹ (+ 18% G.S.T.)
		Two day's slot 300 ₹	Two day's slot 600 ₹ (+ 18% G.S.T.)	Two day's slot 6000 ₹ (+ 18% G.S.T.)
		One Week slot 500 ₹	One Week slot 1000 ₹ (+ 18% G.S.T.)	One Week slot 5000 ₹ (+ 18% G.S.T.)
14.	Pt Paste Electroding*	200 ₹ per sample for sputter of 1 minute	400 ₹ per sample for sputter of 1 minute (+ 18% G.S.T.)	600 ₹ per sample for sputter of 1 minute (+ 18% G.S.T.)

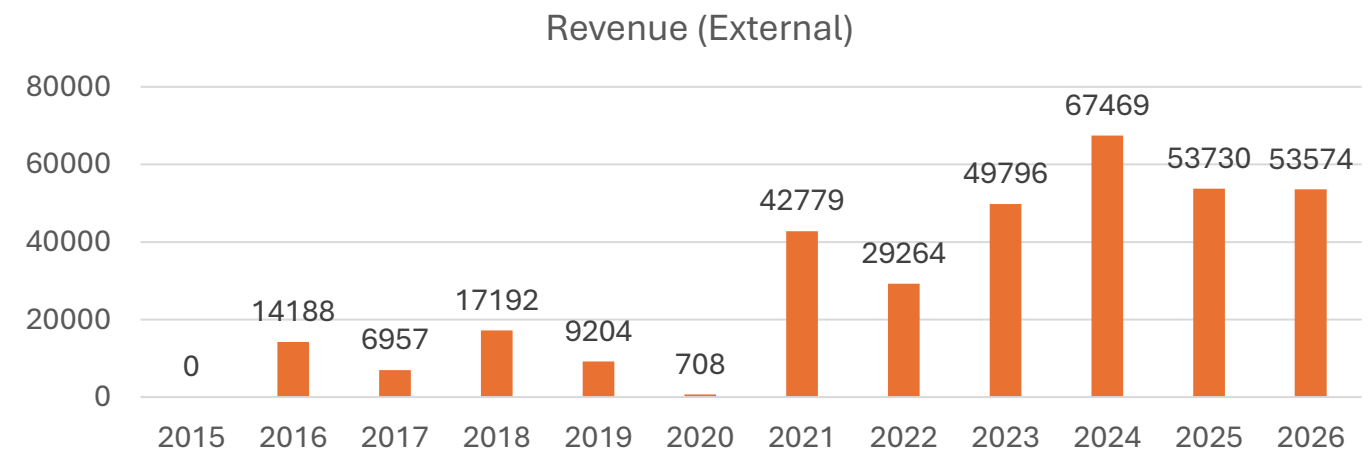
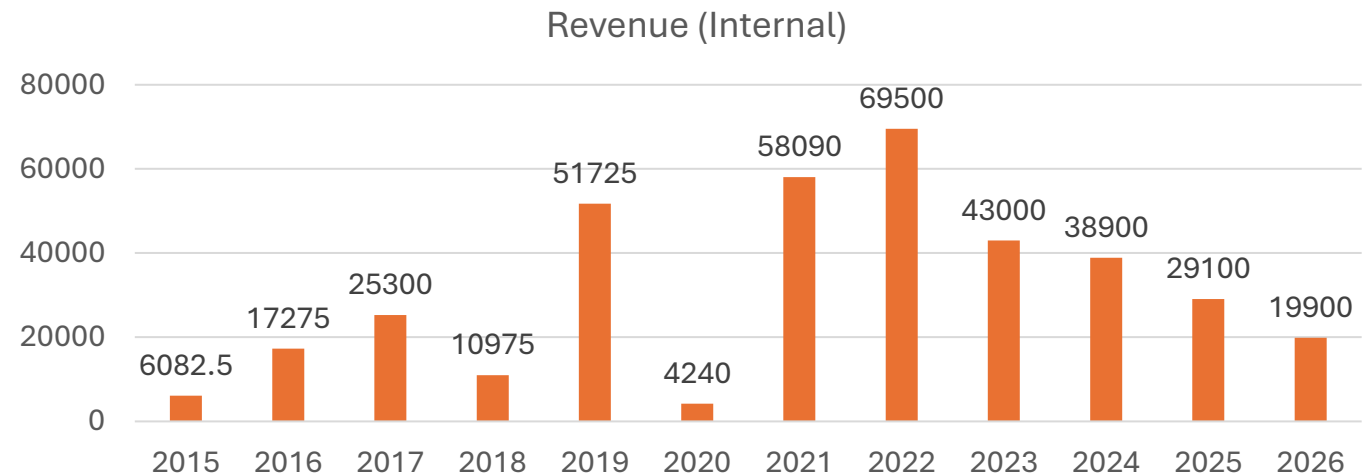
Revenue Generated from IITK (Internal) and Non-IITK (External) Users

	LDA	TESNING A/C		
Year	CHARGES	CHARGES	GST	TOTAL TRANSFER TO R&D
2015	6083	0	0	6083
2026	17275	12236	1953	31463
2017	25300	6007	941	32248
2018	10975	14456	2737	28167
2019	51725	7800	1404	60929
2020	4240	600	108	4948
2021	58090	36253	6525	100868
2022	69500	24800	4464	98764
2023	43000	42200	7596	92796
2024	38900	57177	10328	106404
2025	29100	45495	8189	82784
2026	19900	45402	8172	73474
Total	374087	292425	52416	718927

Since 2015 a total revenue of around Rs 3,74,087 towards Lab Development Account (LDA) has been generated.

Revenue Generated from IITK (Internal) and Non-IITK (External) Users

Revenue Generated		
Year	Internal	External
2015	6083	0
2016	17275	14188
2017	25300	6957
2018	10975	17192
2019	51725	9204
2020	4240	708
2021	58090	42779
2022	69500	29264
2023	43000	49796
2024	38900	67469
2025	29100	53730
2026	19900	53574
Total	374088	344861



Lab & Maintenance Expenditure of ECF Equipment's in ACMS

FY	Description	Convener	From LDA	From ACMS budget	Institute Special Grant
2015-2016	-		-	-	-
Sub-Total				Nil	Nil
2016-2017	-		-	-	-
Sub Total				Nil	Nil
2017-2018	-		-	-	-
Sub Total				Nil	Nil
2018-2019	-		-	-	-
Sub Total				Nil	Nil
2019-2020	-		-	-	-
Sub Total				Nil	Nil
2020-2021	BUYBACK BATTERIES (20 Nos)	DR. S. INGOLE	-	26500.00	-
	APC 10000 VA ONLINE REPARING CHARGES		-	18880.00	-
	TRIAXIAL CABLE		-	21747.60	-
	REPAIRING AND SERVICEING OF CHILLER TANK		-	18526.00	-
	CHILLER PARTS		-	6413.00	-
	ZPLOT SOFTWARE WITH SPARE DONGLE	DR. S. OMAR	-	224700.00	-
Sub Total			Nil	316766.6	Nil
2021-2022	3 KVA ONLINE UPS REPAIRE	DR. S. INGOLE	-	6490.00	-
	TOOLKIT (SPANNER SET & SCREWDRIVER SET)		-	3500.00	-
	DIGITAL MULTIMETER		-	4000.00	-
	DVD WRITER USB PORTABLE		-	1950.00	-
	UPS LEGEND 1000 MICROTEK (02 Nos.)	DR. S. OMAR	-	9600.00	-
	GOLD TARGET		28000.00	-	-
	SILVER CONDUCTIVE PASTE		5460.00	-	-
	ALUMINA ROD		-	2526.00	-
	SILVER WIRE WITH MESH		-	16380.00	-
	REPAIRING AND SERVICEING OF CHILLER TANK	DR. T. MAITI	-	20237.00	-
	ZEM – IR FURNACE CLEAN & OVERHAUL KIT		-	24990.00	-
	ZEM – IR FURNACE MAJOR MAINTANANCE KIT		-	24969.00	-
	ENGINEER ACCOMMODATION CHARGES		5250.00	-	-
	BUYBACK BATTERIES (16 Nos)		-	34400.80	-
Sub Total			38710	123502.8	Nil

Lab & Maintenance Expenditure of ECF Equipment's in ACMS

2022-2023	PANASONIC SINGLE LINE CORDLESS TELEPHONE	DR. S. INGOLE	2728	-	-
	PLATINUM MESH	DR. S. OMAR	24675	-	-
	COMPUTER REPAIRE		1121	-	-
Sub Total			28524	Nil	Nil
2023-2024	PLATINUM MESH	DR. S. OMAR	-	24926	-
	GOLD TARGET FOIL		-	24700	-
	ONE TIME INSPECTION CHARGES FOR IMPEDANCE ANALYZER		99120	-	-
	THERMOCOUPLE K - TYPE		9322	-	-
	AMC FOR THERMOELECTRIC MEASUREMENT SYSTEM	DR. T. MAITI	-	212400	-
Sub Total			108442	262026	Nil
2024-2025	CERAMIC TUBES ALUMINA	DR. S. OMAR	22597	-	-
	THERMOTECH TEMPERATURE INDICATOR (K – TYPE)		2065	-	-
	AMC FOR THERMOELECTRIC MEASUREMENT SYSTEM	DR. T. MAITI	-	212400	-
Sub Total			24662	212400	Nil
Grand Total			200338	914695	Nil

- Since installation (2013-14) to till date so far Rs 11.1 Lakhs has been spent for ECF facility upkeep. out of which Rs **2 Lakhs (21% of total) is from Lab Development Account (LDA)** which has been sustained through User Charges. The remainder part of Maintenance Expenses for ECF facilities **Rs 9.1 Lakhs (79% of total) was through ACMS Budget.**

Key External Users of ECF Facility at ACMS from Academia & R&D organizations

Academic Institutions

- **Dr. Babasaheb Ambedkar Marathawada University, Maharashtra**
- **Assam University, Silchar**
- **Indian Institute of Technology, BHU**
- **Sri Paramakalyani College, Alwarkurichi , Tamilnadu**
- **JNTUA College, Andhra Pradesh**
- **MNNIT ALLAHABAD**
- **Jiwaji University, Gwalior**
- **Gurukula Kangri Vishwa Vidyalaya, Haridwar**
- **Indian Institute of Technology, Dhanbad**
- **Indian Institute of Information Technology, Allahabad**
- **University of Allahabad**
- **University of Hyderabad**
- **Lucknow University**
- **NITK Surathkal**
- **Ravenshaw University, Cuttack, Odisha**
- **Dayal-bagh Educational Institute, Agra**
- **Kanpur University**
- **CV Raman Global University**
- **Indian Institute of Technology, Patna**
- **BITS, Pilani, Goa**
- **Santhom Malankara Arts and Science College, Trivandrum, Kerala**
- **Loyola College, Chennai**
- **School of Advanced Sciences, Vellore Institute of Technology, Vellore**
- **IIITDM, Kancheepuram**
- **RGUKT-AP (state university), Andhra Pradesh**
- **Punjabi University, Patiala**
- **UIET Kanpur**
- **NIT Raipur**
- **AMU Aligarh**
- **Manipal Academy of Higher Education, Karnataka**
- **University of Kerala**
- **Jamia Millia Islamia, New Delhi**
- **Dhempe College of Arts and Science, Miramar, Goa**

Annexure XI



Advanced Centre for Materials Science Indian Institute of Technology Kanpur

Usage Statistics and Fiscal Status Report

- **For Live Cell Imaging (LCI)**
- **Sample Preparation Lab (SPL)**
- **XRF-IRMS Lab**



Advanced Centre for Materials Science Indian Institute of Technology Kanpur

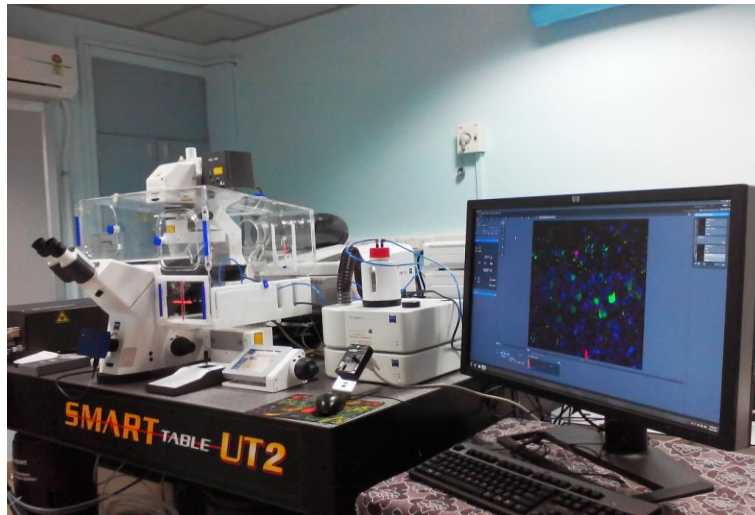
Usage Statistics and Fiscal Status Report **Live Cell Imaging Lab** (Room # 209, ACMS)

Prof. Anish Upadhyaya
(Head, ACMS)

Mr. Ravindra Agnihotri
(Jr. Tech. Supdt., Staff-In-charge LCI)

Prof. Nitin Mohan
(Faculty In-charge, LCI Facility)

Mr. Mitesh Vijaykumar Shrotriya
(Jr. Tech., LCI)



Usage & Financial Summary (2014 - 2026)

TOTAL REVENUE (ALL-TIME)

₹35.77L

₹3,577,460 recorded

CURRENT LDA BALANCE

₹11.12L

₹1,111,945 available

PEAK DEPT USAGE (BSBE)

828h

BSBE usage in 2026

COMPLETE ANNUAL PERFORMANCE (2014 - 2026)

YEAR	INTERNAL CHARGES	EXTERNAL CHARGES	HOURS	RATE / HR
2026	₹434,250	₹0	869	₹500
2025	₹254,500	₹0	509	₹500
2024	₹19,600	₹0	39	₹500
2023	₹280,900	₹0	562	₹500
2022	₹204,000	₹0	408	₹500
2021	₹169,950	₹0	425	₹400
2020	₹90,400	₹0	226	₹400
2019	₹205,600	₹0	514	₹400
2018	₹170,400	₹432	426	₹400
2017	₹174,180	₹0	871	₹200
2016	₹102,254	₹0	512	₹200
2015	₹47,000	₹0	235	₹200
2014	₹1,423,994	₹0	0	N/A

* Summary showcasing the complete 13-year historical cycle. Revenue is predominantly driven by Internal BSBE usage charges. Total historically accumulated hours since 2014 recorded at 5,595 hours across all departments.

Annual Usage Time Trend (2014 – 2026)

TOTAL ACCUMULATED TIME

5,595 Hours

Excluding baseline 2014 setup

PEAK ANNUAL USAGE

871 Hours

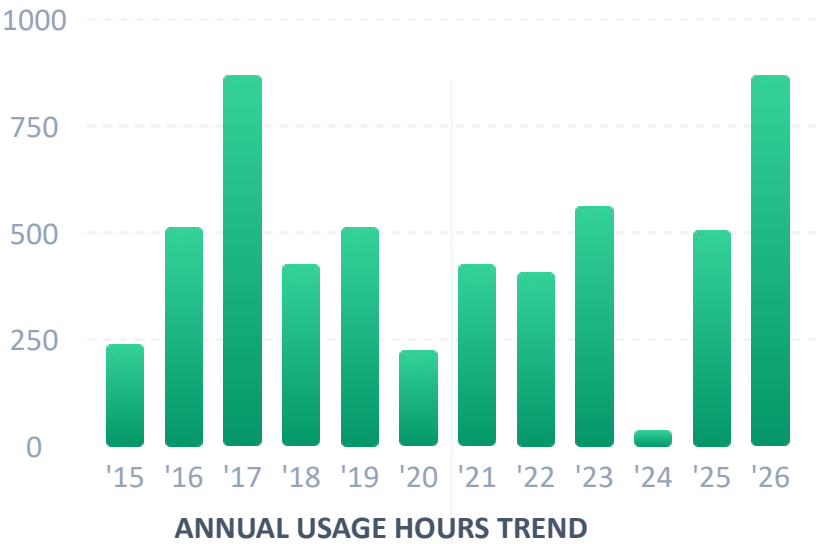
Recorded in FY 2017

HISTORICAL HOURLY CHARGE

₹200 – ₹500/hr

Standardized at ₹500/hr since 2022

YEAR	USAGE CHARGES	HOURS	RATE / HR
2026	₹4,34,250	869	₹500
2025	₹2,54,500	509	₹500
2024	₹19,600	39	₹500
2023	₹2,80,900	562	₹500
2022	₹2,04,000	408	₹500
2021	₹1,69,950	425	₹400
2020	₹90,400	226	₹400
2019	₹2,05,600	514	₹400
2018	₹1,70,400	426	₹400
2017	₹1,74,180	871	₹200
2016	₹1,02,254	512	₹200
2015	₹47,000	235	₹200



- **Fidelity Audit:** 2014 data is omitted from standard accumulated tracking due to its nature as a system setup and operator onboarding phase (funded separately by Zeiss for operator).
- **Usage Trajectory:** Historical usage peaked in 2017 (871 hours) and rebounded strongly in 2026 (869 hours) following a rate adjustments phase.

Departmental Usage & Charges Breakdown (2023 – 2026)

TOP DEPARTMENT USAGE (BSBE)

1,835 Hours

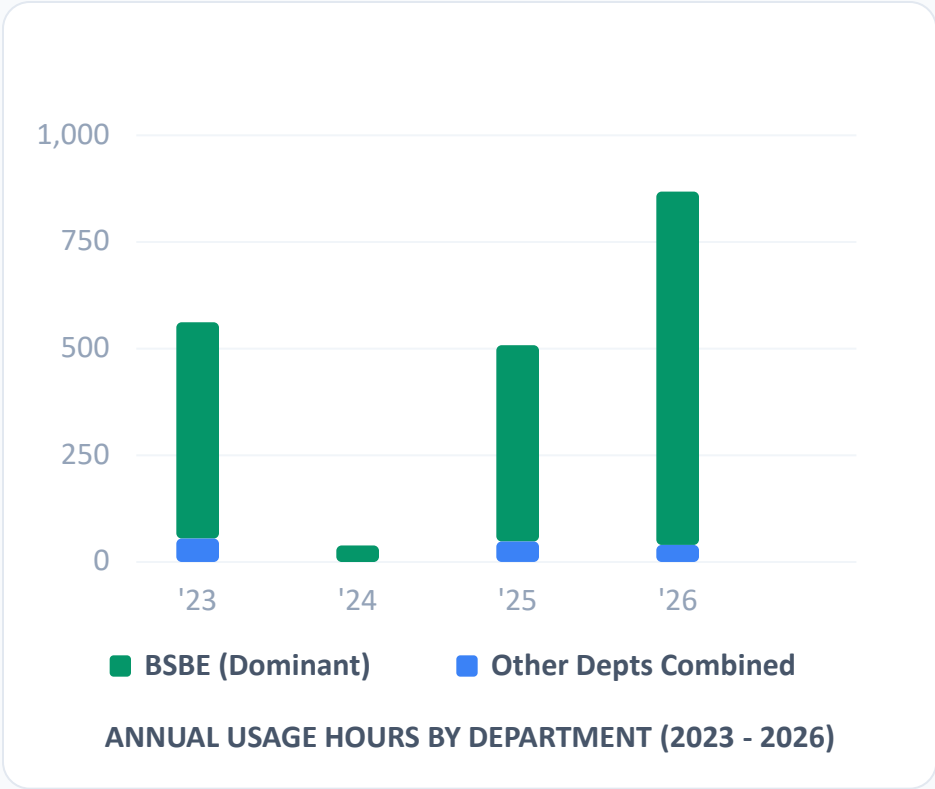
Contributing ₹9.17 Lakhs total charges (2023 - 2026)

OTHER DEPARTMENTS COMBINED

144 Hours

Chemistry, Civil, MSE, ME, MSP, & Chemical

YEAR	DEPARTMENT	CHARGES	HOURS	REMARKS
2026	BSBE	₹4,14,150	828	Till June 2026
2026	Chemistry	₹14,100	28	
2026	Civil	₹6,000	12	-
2025	BSBE	₹2,30,200	460	
2025	Chemistry, Chemical, Civil, MSP	₹24,300	48	Combined non-BSBE
2024	BSBE	₹19,600	39	Breakdown Occurred
2023	BSBE	₹2,53,300	507	
2023	MSE, ME, Chemical, Chemistry	₹27,600	55	Other depts combined



* Departmental usage data extracted directly from lab summaries. Revenue and hour tracking show that Live Cell Imaging (LCI) Lab remains predominantly utilized by the Biological Sciences and Bioengineering (BSBE) department, representing over 93% of overall hours recorded since 2023.

Departmental Distribution of Total Usage Hours (2023 – 2026)

BSBE (Biological Sciences & Bioengineering)

1,835 Hours

Contributing 93% of the overall cumulative hours since 2023

ALL OTHER DEPARTMENTS COMBINED

144 Hours

Chemistry, Civil, MSE, ME, MSP, & Chemical combined (5.8%)



BSBE (Biological Sciences & Bioengineering)

1,835 Hours • 93% of total utilization

Chemistry

83 Hours • 4.2% of total utilization

Civil

15 Hours • 0.75% of total utilization

MSE, ME, MSP, & Chemical

46 Hours • 2.32% of total utilization combined

* Data collected across fiscal years 2023 – 2026. Out of 1,979 total logged hours, BSBE remains the core anchor department for the Live Cell Imaging facility. All other departments aggregate to 144 hours of combined system usage time.



Advanced Centre for Materials Science Indian Institute of Technology Kanpur

Usage Statistics and Fiscal Status Report **Sample Preparation Lab** (Room # 103, ACMS)

Prof. Anish Upadhyaya
(Head, ACMS)

Mr. Jai Kishan
(Tech. Supdt., Staff-In-charge SPL)

Prof. Niraj Mohan Chawake
(Faculty In-charge, SPL)

Mr. Pankaj Kumar
(Jr. Tech. Supdt., SPL)

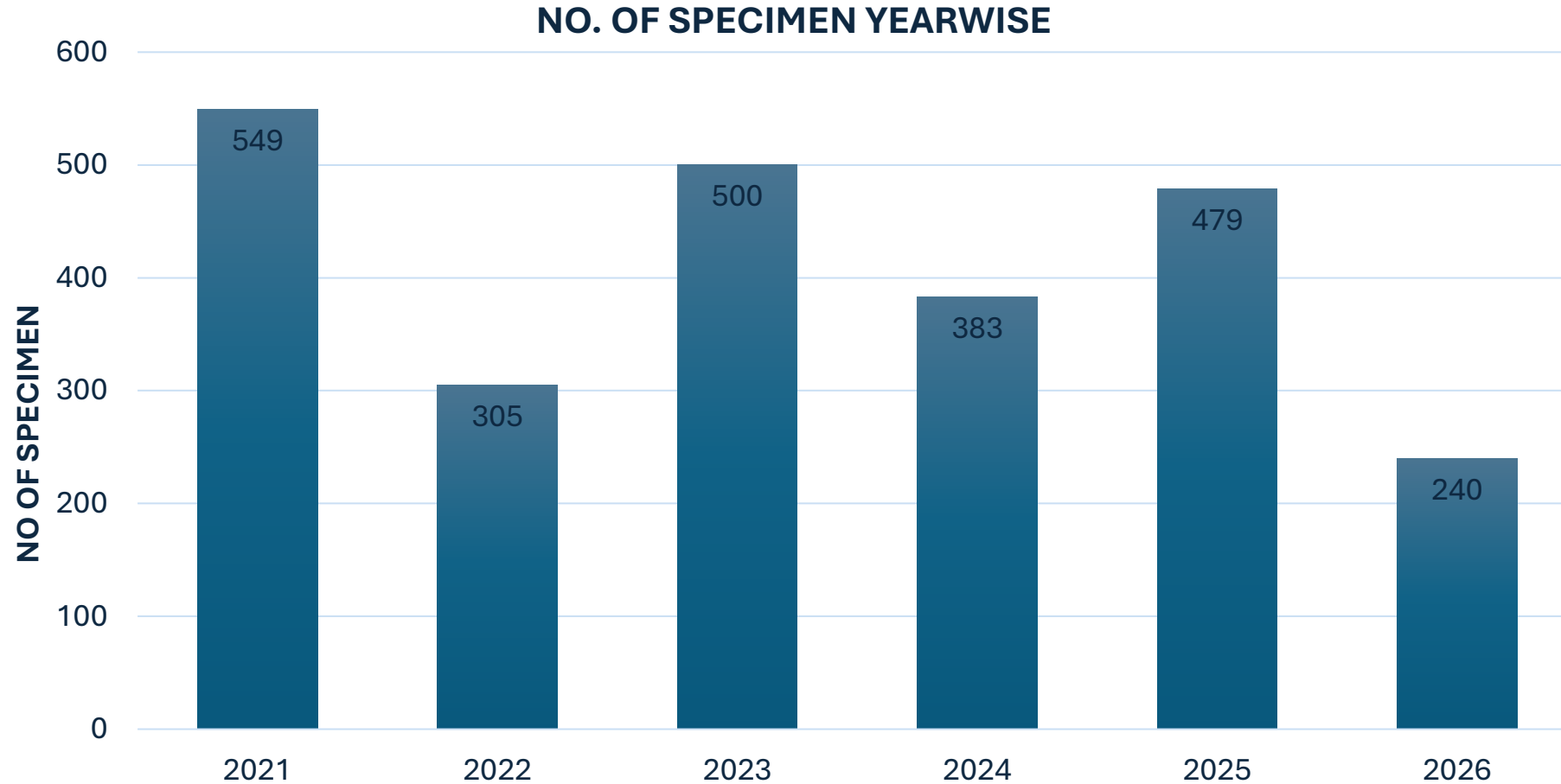
Summary of ACMS, Sample Preparation Lab (SPL)

- Total **4 different equipment** are installed in the Sample Preparation Lab (SPL) at ACMS.
- Vibratory Polishing Machine and Diamond Wire Cut are the two main equipment of the lab so far.
- Over **2456 Samples** have been prepared so far between 2021 to 2026 at SPL.
- Total **5016 Hours** of equipment usage time utilized.
- This lab is mainly used by IITK users.
- Faculty, Research Scholars and Students from **8 Departments and Centers at IIT Kanpur** have utilized SPL facilities since their installation in 2014.
- A total revenue of around **Rs 504290 generated and contributed to LDA of SPL** from 2021 to 2026.

SAMPLE PREPARATION LAB USER STATISTICS UPTO JULY 2026

S.N.	YEAR	NO OF SPECIMEN	HRS. USED	LDA AMOUNT GENERATED(Rupees)
1	2021	549	1194	₹ 119340
2	2022	305	559	₹ 57000
3	2023	500	1054	₹ 107050
4	2024	383	621	₹ 62100
5	2025	479	1067	₹ 106700
6	2026	240	521	₹ 52100
	TOTAL	2456	5016	₹ 5,04,290

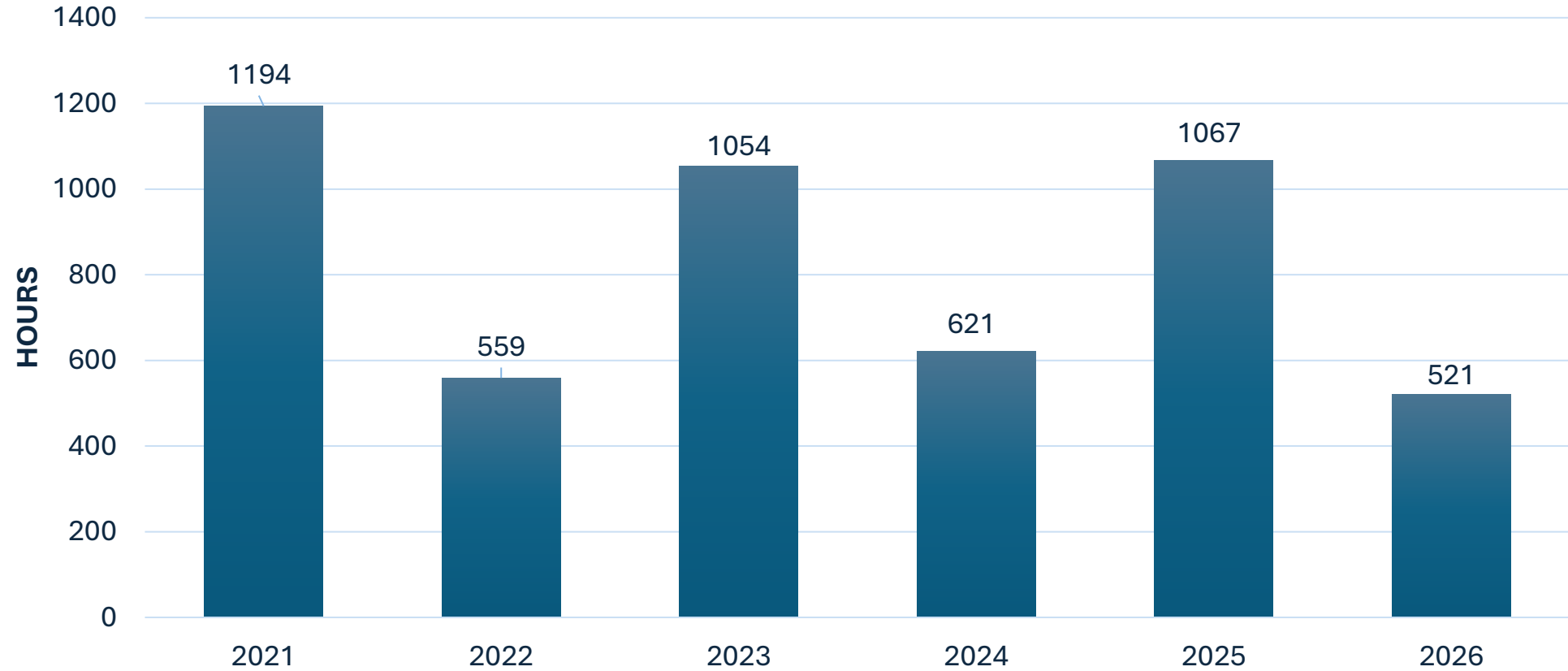
Yearly Summary of **Number of Specimen Prepared**



Total Number of Specimens: 2456

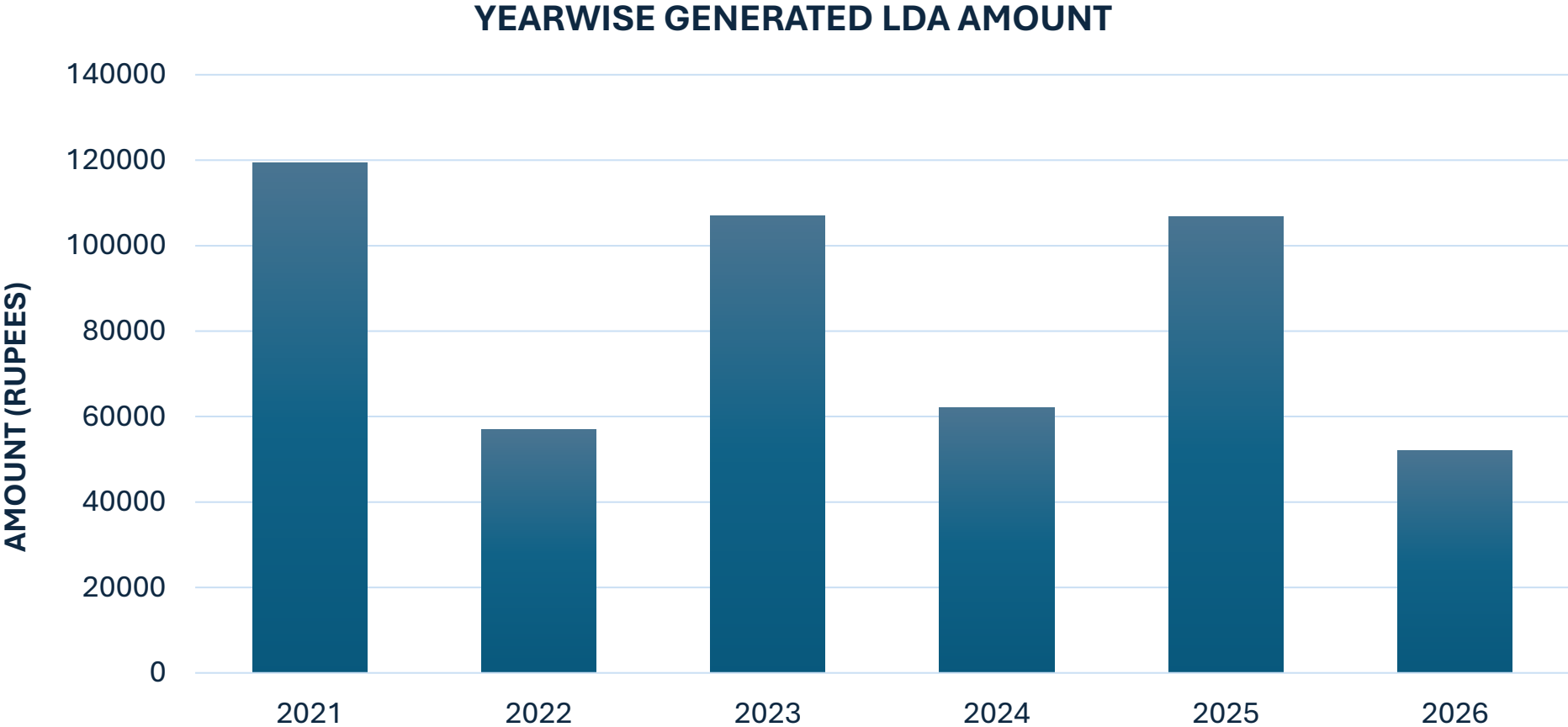
Yearly Summary of Usage Time (Hours)

YEARWISE USAGE



Total Number of Hours: 5016

Revenue Generated from Internal Users



Total Amount Generated = ₹ 5,04,290



Advanced Centre for Materials Science Indian Institute of Technology Kanpur

Usage Statistics and Fiscal Status Report **XRF-IRMS Lab** (Room # 101, ACMS)

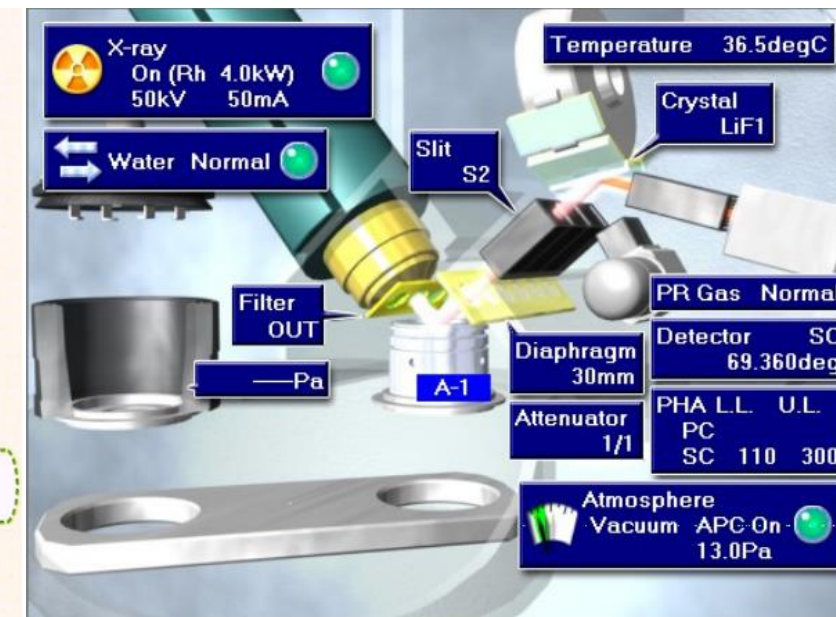
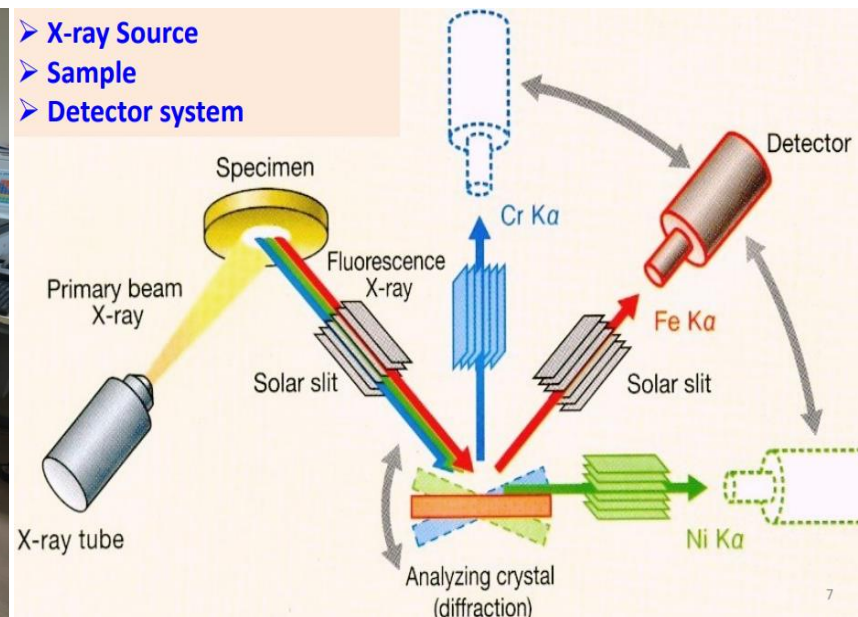
Prof. Anish Upadhyaya
(Head, ACMS)

Prof. Debajyoti Paul
(Faculty In-charge, XRF-IRMS Facility)

Mr. Abhishek Kumar
(Sr. Project Scientist)

Usage Statistics for X- Ray Fluorescence Unit, ACMS

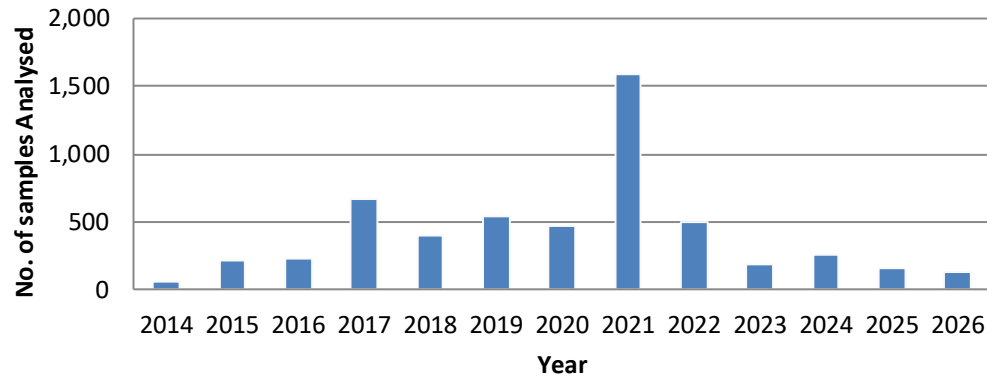
(01.10.2014 to 10.01.2026)



Wavelength Dispersive X-Ray Fluorescence Spectrometer (WD-XRF)

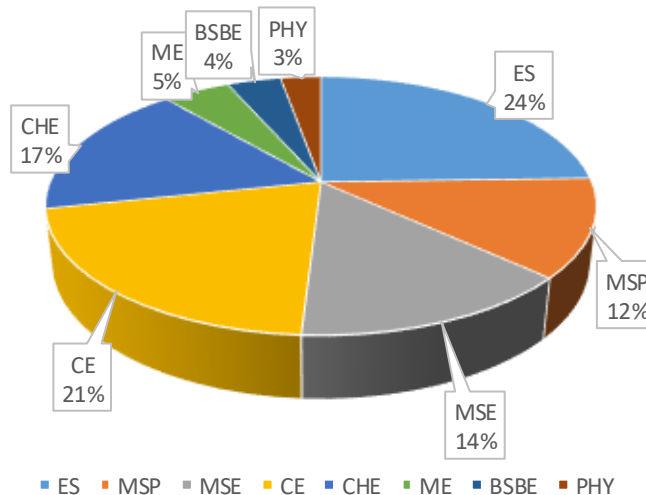
User Statistics, XRF_LDA (01-10-2014 to 10.01.2026)

Yearly Report 2014-2026

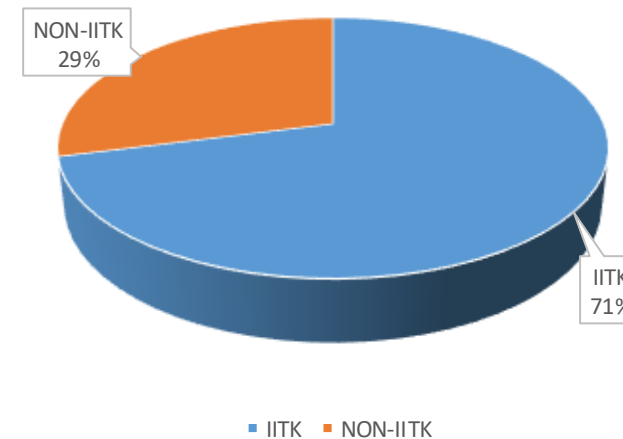


- ❖ Total No. of samples analyzed till January,2025 is 1687.
 - ❖ Total contribution to LDA account from samples analysis is 2695518/- Rs.
 - ❖ Contingency expenditure: 1701836/- Rs.
 - ❖ Salary Paid-526044/- Rs.
- (P-10 gases, AMC, UPS, Batteries, sample accessories, standards, chemicals, printer cartridges, salary paid)
- ❖ **Current Balance: 993682/- Rs. LDA # IITK /ACMS/2021344**

INTER IITK USER STATICS



User IITK Vs Non-IITK



Usage Statistics for IRMS Facility, ACMS

(22.10.2014 to 10.01.2026)



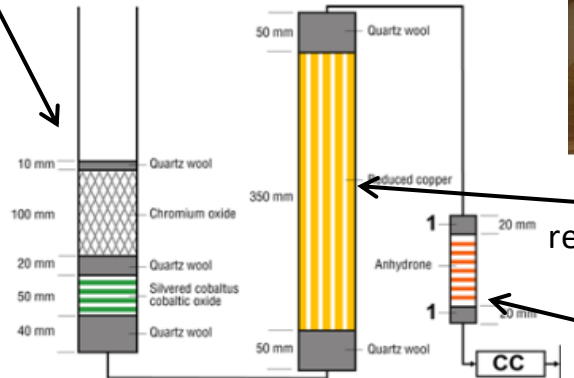
Flash 2000 Elemental Analyzer

Combustion reactor (held at ca. 1020°C)

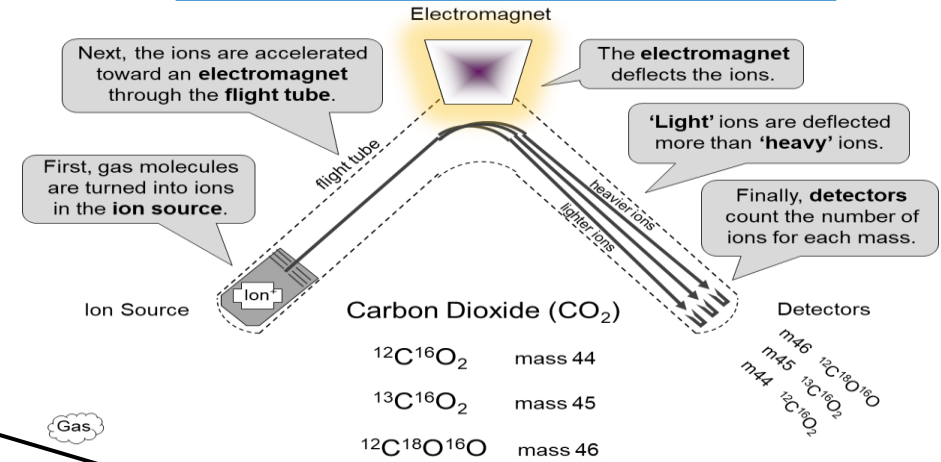


Reduction reactor (held at ca. 650°C)

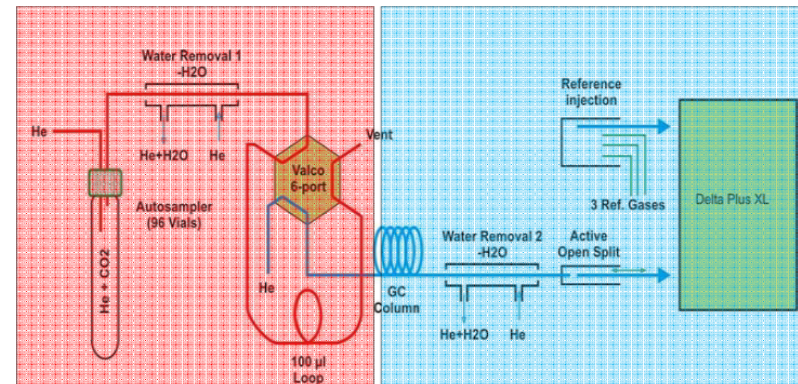
Water trap



Isotope Ratio Mass Spectrometer



Gas Bench Schematics



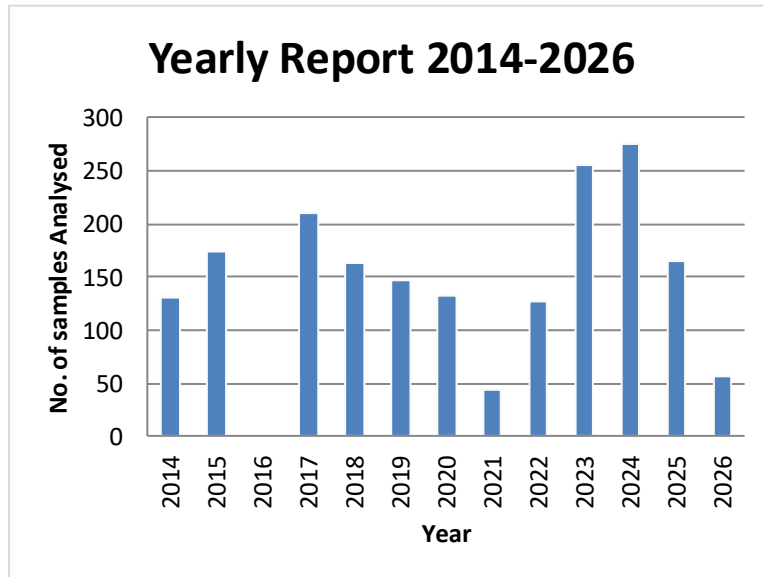
Load Part

Separation & Detection Part

Gas Bench

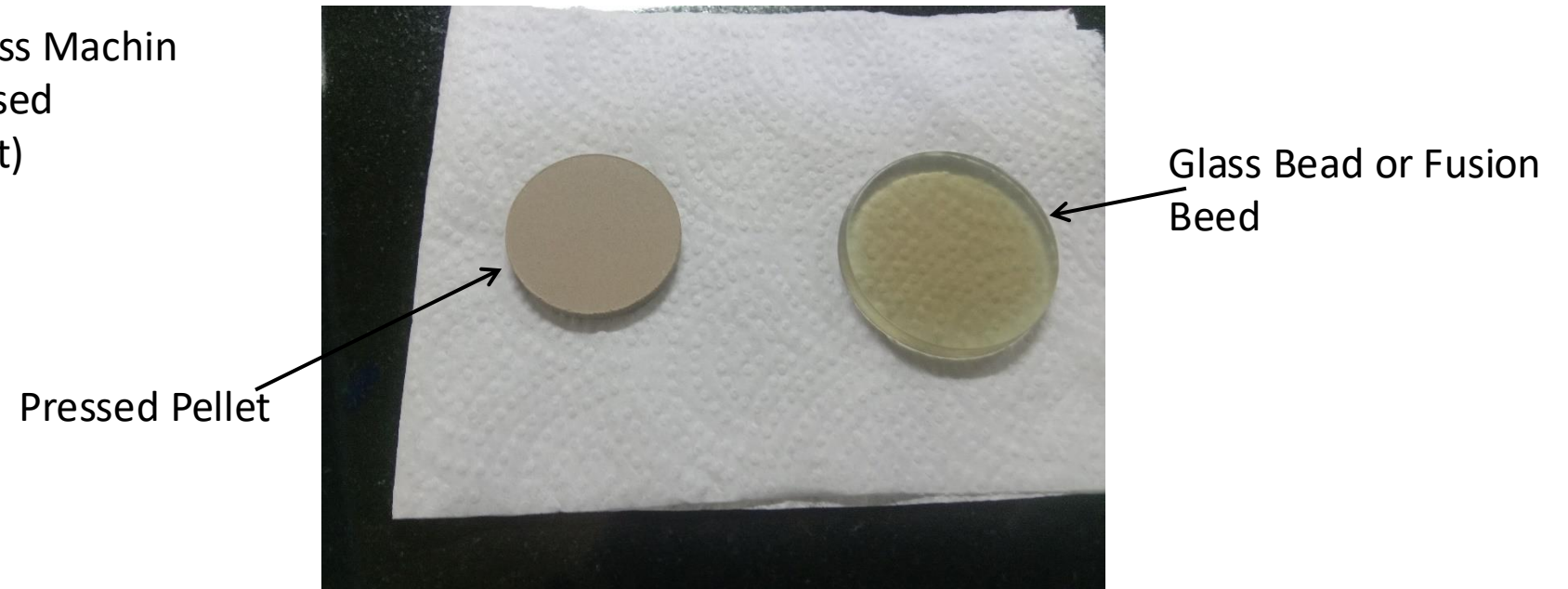
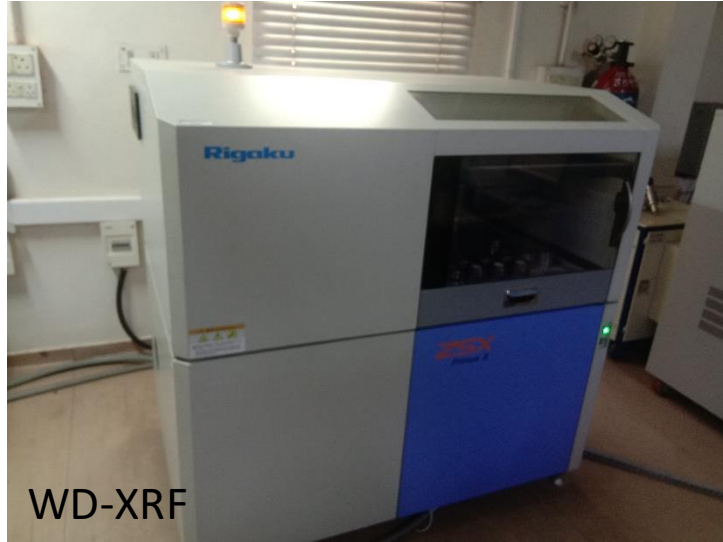


User Statistics, IRMS_LDA (01-10-2014 to 10.01.2026)



- ❖ Total No. of samples analyzed till January,2026 is 5394.
- ❖ The total contribution from sample analysis to the LDA account is 3300177/- Rs.
- ❖ Contingency expenditure: 2692168/- Rs.
- ❖ Salary Paid 709019/- Rs
(Helium Gas Refilling, AMC, UPS Batteries, Purchased Standard, consumables, Salary Paid)
- ❖ **Balance- 608009/- Rs. LDA account # IITK /ACMS/2021331**

Lab Instruments(WD-XRF)



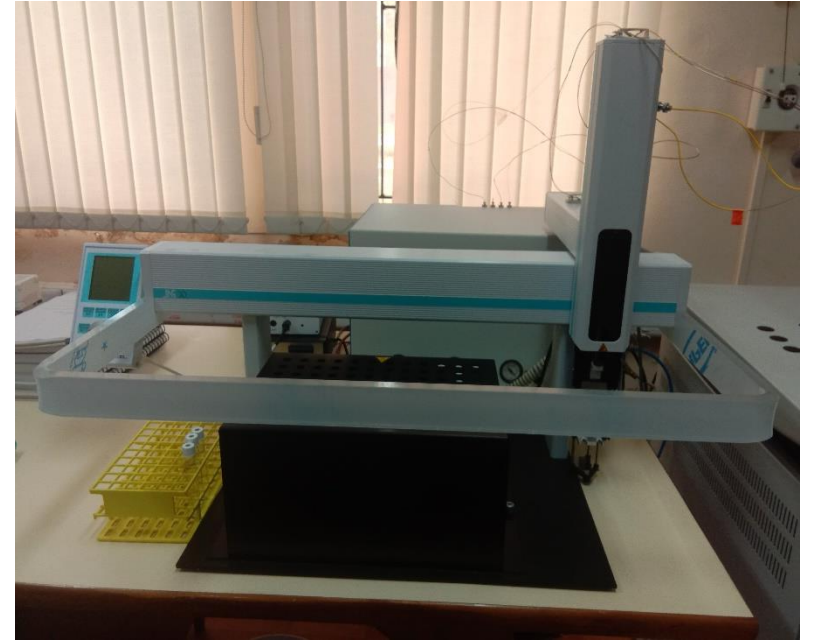
Lab Instruments(IRMS)



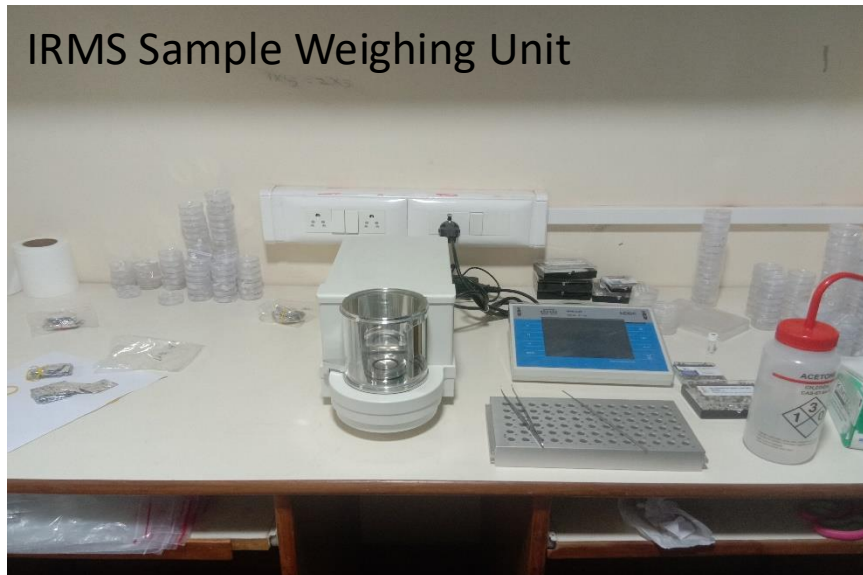
Delta V Plus, Mass Spectrometer



Elemental Analyzer, Flash 2000



Gas Bench



IRMS Sample Weighing Unit