Jai Hind is under graduate college with a handful of departments with post graduate courses. Institute took steps to get students and faculty interested in research activities and applied for grants to DST for FIST. We got Rs. 70,00,000/- (Seventy Lakh) as grant for ZERO level under DST-FIST scheme.

Infrastructure developed:

The college has set up 'Center for Research 'which is Common Instrumentation Room for all science departments . Major instrument are kept in this instrumentation room for common availability for research facility.

College has also set up computer lab using the computational funding provided by FIST, out of which college purchased 15 computers, undergraduate students are getting benefitted by this facility created.

LIST OF INSTRUMENTS AVAILABLE IN JAI HIND COLLEGE.

Equipment purchased & installed (COST ABOVE 60,000/- only are listed in this)

Name (with Model & Make)

Sr. No.	Name of Equipment ordered/Purchased	Funding agency	Model & Make of instrument
1	Ice Machine (Cresent)	DST-FIST	Hoshizaki km75A
2.	Frank Hertz Experiment	DST-FIST	Bsteo-1997
3.	Rotary shaker Incubator with temperature variation	DST-FIST	Remi 24BL
4.	Distillation assembly	DST-FIST	Borosil 3362(4 Liter)
5.	Refrigerated Centrifuge	DST-FIST	Remi(C-24+)
6	Rotary Evaporator	DST-FIST	HEI-VAP Value digital G3
7	DC current source and Nanovoltmeter	DST-FIST	Keithley
8	Gilson Fraction Collector	DST-FIST	Gilson FC203B
9	Over head stirrer	DST-FIST	Heidolph
10	Spectroflourimeter	DST-FIST	Toshvin Analytical

11.	Differential Scanning Colorimeter	DST-FIST	Shimadzu DSC-60
12	Refrigerated Centrifuge Rota-3R	Lady Tata Memorial Trust	PLASTOCRAFT
13.	Fluorescent attachment for Binocular microscope	Lady Tata Memorial Trust	MAGNUS
14	Eliza reader	Lady Tata Memorial Trust	Tulip diagnostics
15.	Western blot	Lady Tata Memorial Trust	Hi-media
16.	FTIR	SEA	Agilent Carry 630
17.	HPLC	UGC	Agilent
18.	PCR	UGC	Eppendroff
19.	Gel Documentation	UGC	BIO-ERA
20	UV-Visible spectrophotometer	Lady Tata Memorial Trust	Systronics
21	UV-Visible spectrophotometer	UGC	Systronics
22.	Probe- Sonicator	UGC	SAMARTH ELECTRONICS
23.	Revolutionary High Speed centrifuge with 3 Rotors	Lady Tata Memorial Trust	E-TEK

LIST OF **DEMONSTRATIONS** CONDUCTED ON VARIOUS INSTRUMNETS IN CENTER FOR RESEARCH LAB

1. Rotary evaporator
2. Spectroflourimeter
3. Differential scanning colorimeter
4. Gel documentation
5. Gel rocker
6. Sonicator
7. HPLC
8. Cold centrifuge
9. Fraction collector
10. Binocular Microscope

Demonstration was conducted **for teachers and non-teaching faculties** of Jai Hind (Lab assistants and lab attendants) for handling of **Double distillation plant** as this facility is basically required by all researchers and departments of science.

Talk was organized on **Introduction to HPLC – basic principles** in operation by **Dr. Sanjay Dhuri** from **LCGC** in chemistry seminar room, around 15 teachers got benefitted with this.

Following **training Instrumentation workshops** were conducted in center for research laboratory.

1. For undergraduate and post graduate science students of Jai Hind College, hands on training for **ROTAVAP, BINOCULAR MICROSCOPE WITH CAMERA, PREPARATION OF NANOPARTICLES, KARL- FISHER AUTOTITRATOR, PROBE SONICATOR** on 29th March 2016. **38students** including research students and one teacher got benefitted with this .Jai Hind Faculty served as a resource persons for this .**ONE day** workshop included presentations followed by hands on training.

2. One day Workshop in **collaboration with SHIMADZU** India ltd. for hands on training for **SPECTROFLOURIMETER AND DIFFERNTAIL SCANNING CALORIMETER** on 27th April 2016.
   TEN science teachers from Jai Hind College participated in this and got benefitted.
3. Hands on training **TWO DAYS** workshop in collaboration with BIOERA INDIA LTD. for undergraduate students of Jai Hind was organized on 10th and 11th June 2016. **18 science** students participated in this and **FOUR bioscience** teachers served as resource persons on DAY 1. Second day sessions were conducted by BIOERA faulty .It was hands on training on **GEL ELECTROPHORESIS AND GEL DOCUMENTATION.**
4. **Department of biotechnology** conducted **four days** workshop on 'techniques and applications in Immunology'29th June To 2nd July 2016, sponsored by Lady Tata memorial trust. Around 40 participants including Ph.D. students faculty and undergraduate students got benefitted with this**.**
5. **Department of Life sciences** conducted its annual workshop base on Neuroscience 'Perception v/s recongnition' on 9th and 10th December 2016, sponsored by Lady Tata Memorial trust.Thirty faculty members from various colleges and university department of life sciences across biosciences and 100 students attended this**.**

6. MOLECULAR BIOLOGY workshop was conducted by **Department of Microbiology** in two batches of **two days** duration .Forty five students attended this workshop. Batch one was for Jai Hind college students (28) and batch two was for MSc students (17) from different colleges of University of Mumbai.

7. **Department of Microbiology** conducted teachers training program sponsored by Lady Tata Memorial Trust ' a workshop on Proteomics ' was conducted from 8th February to 11th February 2017. Thirty teachers attended this hands on training.
8. **ONE DAY** training workshop was conducted for graduate and postgraduate students on, Hands-on training for 'Column Chromatography, Fraction Collector and Rotavap' by our faculty member Dr.Sajith Chandran on 7th April 2017**.**

9. **ONE DAY workshop on 'Interpretation of FTIR SPECTRUM' .**This workshop included principle, instrumentation, applications and interpretation of FTIR spectrum**.** It was lecture followed by practical session **.**Various students from various colleges and our own science faculty participated in this workshop held on 2nd December 2017. Dr.Pavan More, Assistant Professor , Department of Chemistry, Institute of Chemical Technology served as a resource person .
10. **'SIGNATURE OF MOLECULES' two days workshop conducted for undergraduates and postgraduate students in association with Indian Chemical Society on 15 &16th September 2017.**
11. **Workshop on Hands-on training on 'Blood staining and ABO typing'** was held on 12th April 2019.Our own faculty Mrs.Roonal Kataria served as a resource person. Undergraduate students took benefit of the same.
12. ONE DAY workshop on 'SPECROMETRY APPLICATIONS' held on 15th April 2019. Dr.Rajesh Vadgama, Research scientist (ICT-Center for Biosciences) was a resource person. Undergraduate students participated in the workshop performing some interesting experiments with UV-VISIBLE spectrometer, handling the software.

Creation & Utilization of Facilities to enhance teaching as a consequence of the FIST support:

a. **New class-room experiments at B.Sc./ M.Sc. or other levels-**

- Physics department has set up new experiment, 'Magnetostriction measurement of magnetic materials', where in keithely nanovoltmeter and current source procured through fist grant is used as a part of the setup. The same set up is also used for teachers Ph.D. work.
- Students of biotech department had a project component as a part of their syllabus. The department of chemistry helped a group of four students in extraction of essential oil from clove and pepper. After extraction, the combined extracts were distilled under reduced pressure using Heidolph Rotary Evaporator. The students were trying to study synergistic effect of these secondary metabolites.
- Other group of students studied extracts from soxhelet extraction of secondary metabolites from barringtonia and other plants on the rotary evaporator.
- The four students with organic specialization were grouped in pairs of two and were given small research problems involving development of fluorescent sensors for Cu^{2+} and Zn^{2+} ions. One group, guided by Dr. Sreela Dasgupta, worked on BINOL based **fluorescent sensor** for Cu^{2+} and its application in sensing copper ions in potable water stored in copper vessels. The preliminary qualitative observations showed quenching action of fluorescence in the presence of Cu^{2+} ions.
- The emission spectra of BINOL was recorded using **shimadzu spectrofluorimeter.** The work has to be extended to establish quantitative relationship and to study interferences in measurement.
- A second group, guided by Mr. Gokul Ganesan, was working with salicylaldehyde 2-aminophenol schiff's base ligand as a fluorescent turn on sensor. The synthesised molecule was non-fluorescent but exhibited blue fluorescence in the presence of Zn^{2+} ions. Qualitative measurements showed enhancement of fluorescence with increase in Zn^{2+} ions. This work has to be extended to check for quantitative relationship & also the ligand structure suitably modified to make it water soluble.

b. i) Modification of existing experiments at UG level:

- Use of Gel rocker & Gel doc for uniform staining of electrophoretic plates for separation of proteins
- Veego M.P. apparatus for recording melting points of high melting compounds from organic syntheses
- Binocular LED microsopes for microscopy experiments in Botany, Life Sciences & Microbiology

- Rotary shaker for performing organic reactions (synthesis of naphthyl benzoate) & for physical chemistry practical (study of effect of ionic strength on solubility product of calcium sulphate)

- Soxhelet & steam distillation of plant material and concentration using rotary evaporator for bioisolates

ii) Modification of existing experiments at PG level:

- Rotary evaporator & Fraction Collector in conjunction with column chromatography for M.Sc. Part II (Organic Chemistry)

FUTURE PLANS

- Research facilities in Jai Hind should be further enhanced so that still more faculty and students get involved in research related activities .
- To encourage more number of Students participating in various research projects related competitions .
- Facilities available in Jai Hind College should also benefit the students and teachers in nearby colleges, the same can be achieved through various workshops to spread awareness about facilities.
- To look for some more Industrial collaborations which will benefit the students as well as teachers .