

Detailed Project Report
Modernization and Up-Gradation of
National Institute of Technology Srinagar
Under
PMDP

Submitted to MHRD



National Institute Technology Srinagar,
Hazratbal Srinagar Kashmir, J&K

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1. Introduction

PMDP was approved for NIT Srinagar on 09/08/2016 for Up-gradation and Modernization of various facilities at NIT Srinagar. An amount of Rs INR 100.00 Crore was sanctioned for implementation of the project at NIT Srinagar

The details of various activities initiated at NIT Srinagar for up gradation, Modernization and removal of obsolescence in various departments, and laboratories, and for developing state of art facilities and laboratories, for students at U.G, P.G and at Research level are given below

- **Modernisation of Hostel/ Mess**
- **Modernization of medical facilities**
- **Up gradation of Sports facilities**
- **Up gradation of wifi enabled campus and computer services centre**
- **Smart Class room**
- **Up gradation of institute library**
- **E- Education Management**
- **Developing innovation incubation and entrepreneurship development Centre**

The work on PMDP was started in December 2016 and an amount of Rs 35.18 Crore has been spent on various activities of the project till date. The amount was spent from plan grants as MHRD did not release any grant for PMDP till date. Monthly progress report of the scheme has been submitted to MHRD, till ending October, 2018. The project was put under halt from March 2018 due to non-availability of finance.

In the recent Board meeting held on **29/09/2018**, it was resolved that a fresh DPR will be submitted to MHRD for revisiting the project and to complete the remaining works of the project successfully. An amount of INR 64.82 are further required to complete the remaining works of the PMDP project. The details of activities to be completed and the requirement of funds to complete the remaining work of the project are given in the following sections.

2. Students Centric Developments

2.1 Modernization of Hostel Mess, Kitchen, Food outlets, etc. :

There are nine hostels in the Institute and more than 2500 wards are residing in these hostels. The weather in Srinagar remains cold and harsh from September to March and in absence of proper heating system, it is difficult to provide heating arrangement in the hostels for the students, for such a long period of 07 months. This problem has been further aggravated as the number of students has increased to a large extent. It is not possible to provide heating arrangement separately to individual students through electric heating due to shortage of electricity during these months. Therefore, NIT Srinagar needs to provide appropriate heating system in the hostels.

In order to provide healthy, hygienic food to the students residing in various hostels it is necessary to follow the guidelines set by Food Safety and Standards Authority of India. It is proposed to refurbish the dining halls of student messes and the food outlets and other services for the students at the campus with appropriate interventions like furniture, equipment, benches, rain/sun shades and lighting etc. In addition, it is also proposed to provide washing and cleaning facilities for clothes to the students residing in various hostels. The estimated amount for this activity is 1437.00 Lac.

The details of works completed and to be completed under this activity are given in Annexure- I.

2.2 Modernization of Medical Facilities :

As the number of students has increased 10 times as compared to the number of students before conversion from REC to NIT. It is proposed to create a modern diagnostic centre with need basis facilities in the institute and to develop a physiotherapy centre for the students and staff. The estimated amount is 375.00 Lac.

The details of works completed and to be completed are given in Annexure-II

2.3 Up-gradation of Sports facilities:

Good Sports facilities are very essential for a professional Institute so that the students utilize these for their overall development. In this regard it is proposed to develop the outdoor/indoor facilities with latest technology. The estimated amount for this activity is 1820.00 Lacs.

The details of works completed and to be completed are given in Annexure-III.

3. Modernization of Infrastructure of Institute

3.1 Up-gradation of WIFI enabled campus and Computer Services Centre:

It is proposed to widen the internet coverage and extend it to all the students in their hostels and develop a Wi-Fi enabled Campus. It is proposed to develop a software development cell, cyber forensic lab and Campus placement lab in the institute. In addition, it is also proposed to make available all licensed software's of general nature to all students and staff through networking under the computer services centre. The estimated amount is 2000.00 Lacs for this activity. The details of works completed and to be completed are given in Annexure-IV.

3.2 Modernization of Teaching-Learning facilities/ Smart classrooms

NIT has 40 classrooms which includes new and old class rooms. These classrooms need to be up graded with latest teaching aids and other facilities. In addition there are ten conference rooms in various departments. The estimated amount is 1418.00 lacs .It is proposed to refurbish the class rooms, seminar rooms, laboratories by appropriate modifications and installation of the state of the art facilities to convert them into Smart class rooms so that the teaching/learning process becomes interactive, more fruitful and interesting. The estimated amount is for this activity is 1418.00 Lac.

The details of works completed and to be completed are given in Annexure-V.

3.3 Up-gradation of the Institute Library:

With introduction of a number of PG programs during the last 4 yrs and enrolment of a large number of Ph.D. Scholars across all departments, it has become very essential to procure the related reference materials including additional e-resources etc, for such students in addition to normal books and other facilities in the library to make it an interesting and a hub of the academic activities. It is also pertinent to maintain that during 2014 floods, a large number of Text books and references were damaged. In order to compensate the same, library needs to purchase Text books and references. The estimated amount for this activity is 1250.00 Lacs.

The details of works completed and to be completed are given in Annexure-VI.

4 Campus e-Governance Education Management System:

NIT Srinagar needs Campus e-Governance Education Management System and MIS. It should contain all facilities for automation viz., a fully integrated , secured, rule based-online e-Governance system, with inbuilt smart card and Bio-Matrix support for students and faculty, computerization of complete academic activities of students from admission to his degree printing, online fee payment, UHF based attendance, pre-admission process, admission process counselling, fees collection and reports, course registration, academic calendar, teaching plan, timetable and attendance, pre-examination work, post-examination work, SMS and e-mail alerts for students and faculty etc. The other facilities include fully integrated, multi-user system with full protection against unauthorized access, secured, accurate & timely information to users at all levels for better decision making. This will improve the overall efficiency of various users and hence will improve the performance of the system. The estimated amount is for this activity is 200.00 Lac. The details of works completed and to be completed are given in Annexure-VII.

5. Up-gradation of Research & Innovation Centres

Of late, research and teaching activities at PG level are growing at fast pace at NIT Srinagar. At present more than 400 Research Scholars are pursuing Ph.D. in various disciplines of science and Engineering in the institute. There are more than 200 students pursuing M. Tech degrees in various Engineering departments. Number of Ph.D. Students and Post Graduate students will receive a quantum jump in near future. In order to cater to the Research facility needs of Ph.D. & Post Graduate students and faculty, NIT Srinagar has to augment its Research facilities with state of art equipment in various research areas. Moreover NIT Srinagar has established 05 Centres in the institute. Further to encourage innovation & entrepreneurship amongst the students, there is a strong need to upgrade the existing Innovation, Incubation & Entrepreneurship Development Centre (IIEDC) also. The estimated amount for this activity is 1500.00 Lacs.

The details of works completed and to be completed are given in Annexure-VIII.

2. Students Centric Development

Table 2.1.1 Modernization of Hostels, Messes, Kitchens, Food Outlets etc.

S.no	Details of Items /works	Total funds allocated lacs	Funds Utilized in lacs	Status
1	Rice Streamers, Mofars, Dish washers, washing machines, Deep Freezers, ovens etc For Jhelum Hostel, Chenab Hostel, Indus Hostel, Tawi Hostel, C Block/ Barak (M.Tech), Dal Hostel, Jhelum Hostel, 2 pre Fab, Girls Hostel	90.00	90.00	Completed
2	Fully Automatic Washing machines for 09 hostels (Jhelum Hostel, Chenab Hostel, Indus Hostel, Tawi Hostel, C Block/ Barak (M.Tech), Dal Hostel, Jhelum Hostel, 2 Pre Fab, Girls Hostel. (one per hostel).	90.00	90.00	Completed
3	Central Heating System for Tawi, PG, Indus , Chenab Hostel and Girls Hostel with power backups and electrification.	1100.00	0.00	Incomplete
4	Music system, Public Address System, Overhead projectors for Hostel Lawns, Digital Notice Boards, UPS and Inverters	30.00	0.00	Incomplete
5	Kitchen appliances for all the messes	22.00	0.00	Incomplete
Sub total		1332.0	180.00	-----

Table 2.1.2 Food Court

S.No	Particulars	Total amount (In Lacs)	Funds Utilized in lacs	Status
1	15*15 meters(900 Sq M) 04 No's	100.00	100.00	Completed
Sub total		100	100.00	-----

Table 2.1.3 TV Room/Study Hall/Guest Lobby/Indoor Games Hall

S.No	Particulars	Total amount (In Lacs)	Funds Utilized in lacs	Status
1	Indoor games PS4 and X box	5.00	0.00	Incomplete
Sub total		5.00	0.00	-----
Grand Total		1437.00	280.00	-----

Status of Modernization of Hostels, Messes, Kitchens, Food Outlets etc

Total amount allocated = 1437.00 INR in Lacs
Total amount utilised till date = 280.00 INR in Lacs
Funds required to complete the remaining works = 1157.00 INR in Lacs

Annexure II

Table 2.2: Modernization of Medical Facilities

S.no	Item/ Facility	Total Funds allocated in Lacs	Funds utilized in Lacs	Status
1.	Oxygen Concentrator, ECG Monitor, Blood Analyzer	36.00	36.00	Completed
2.	Fully Automatic Biochemistry Analyser, Neflometer, Urine Analyser, ABG Analyser, Automatic Coagulation Analyser, CR Monitor, Modern Physiotherapy Centre	339.00	0.00	Incomplete
Grand Total		375.00	36.00	

Status of Modernization of Medical Facilities

Total amount allocated = 375.00 INR in Lacs
Total amount utilised till date = 36.00 INR in Lacs
Funds required to complete the remaining works = 339.00 INR in Lacs

Table 2.3: Up-gradation of Sports Facilities

S. No.	Equipment/ Infrastructure Required	Total Funds allocated in Lacs	Funds utilized in Lacs	Status
1.	Basketballs, Footballs, Volley Balls, Handballs, Cricket Bowling Machine, Score Books for all games, Officiating Chair Volley Ball	24.00	0.00	Incomplete
2.	Basketball baskets, Football nets, Volley Ball nets, Handball nets, Basketball Boards	17.00	0.00	Incomplete
3.	Badminton Rackets, Shuttle Cocks, Badminton Nets	15.00	0.00	Incomplete
4.	Hockey Sticks, Hockey Balls, Nets of goal posts	16.00	0.00	Incomplete
5.	Lawn Tennis Rackets, Balls and Nets, Officiating Chair	14.00	0.00	Incomplete
6.	Cricket Bats, Balls, Batting Pads, Keeping Pads, Keeping gloves, Batting Gloves, Stumps, Thigh Pads, Abdomen Guards, Thigh Pads, Elbow Guards, Helmets, Cricket Shoes, Tennis Cricket Bats, Tennis Cricket Balls	30.00	0.00	Incomplete
7.	Digital Score Board, Practicing Cricket Nets	45.00	0.00	Incomplete
8.	Movable state of art Goal posts for Football, Hockey & Hand ball	12.00	0.00	Incomplete
9.	Moveable state of art Side screen for cricket	12.00	0.00	Incomplete
10.	Shot Put, Javelin, Discuss, Hurdles, Batons, Starter, Take Off Board,	14.00	0.00	Incomplete
11.	High Jump Mats, Rods other accessories, Rafting boats, life jackets, racing boats, parachutes, kayaking boats, canoeing boats and allied accessories etc.	34.00	0.00	Incomplete
12.	Sports Shoes for all games, Kho-Kho Poles, Lime Powder	17.00	0.00	Incomplete
13.	Uniforms for 14 sports activities and Track Suits	15.00	0.00	Incomplete

Indoor Facilities				
14.	Indoor Badminton Courts	100.00	0.00	Incomplete
15.	TT Tables, TT Balls, TT Bats, TT Nets , Carom Boards, Carom Powder, Carom Points, Carom & Chess Tables & Chairs Chess Boards, Chess Mats, Chess Clocks, Boxing Ring One & 10 Boxing Kits	40.00	0.00	Incomplete
Modernization and up gradation of Gymnasium facilities				
16.	16 station Modern Gymnasium	140.00	0.00	Incomplete
Machinery				
17.	Mini Tractor 1, Lawn Mowers 5 No's	25.00	0.00	Incomplete
Sub Total		570.00	0.00	

Table 2.3.1 Up-gradation of Sports Facilities (Through BWC of the Institute)

S. No.	Items/ Facility	Total Funds allocated in Lacs	Funds utilized in Lacs	Status
1	Up-gradation of Outdoor Sports Facilities: American Synthetic artificial turf Basketball Courts, Volley Ball Courts, Badminton Courts Outdoor, Football Court, Hockey Court, etc. etc. Practicing Cricket Nets, Flood Lights, etc.	1250.00	1250.00	Funds transferred to CPWD for civil works and work in progress
2	Up-gradation of Indoor Sports Facilities Indoor Badminton Courts, etc. etc.			
3	Up- gradation of main ground Turfing and Leveling etc.			
Sub Total		1250.00	1250.00	
Grand Total		1820.00	1250.00	

Status of Up-gradation of Sports Facilities

Total amount allocated = 1820.00 INR in Lacs

Total amount utilised till date = 1250.00 INR in Lacs

Funds required to complete the remaining works = 570.00 INR in Lacs

3. Modernization of Infrastructure of Institute

3.1 Up gradation of WIFI enabled Campus and Computer Services Centre

Table 3.1.1 Open Air WI-Fi Project

S.No.	Item/Facility	Total Funds allocated in Lacs	Funds utilized in Lacs	Status
1.	Smart Zone 100 Wireless Controller	15.00	0.00	Incomplete
2.	Outdoor access point	30.54	0.00	Incomplete
3.	Outdoor 802.11ac 2x2:2	15.00	0.00	Incomplete
4.	Dual-band 802.11abgn/ac Wireless Access Point	18.00	0.00	Incomplete
5.	P300, single unit	8.00	0.00	Incomplete
6.	Gigabit PoE Injectors	32.19	0.00	Incomplete
7.	AP management license for SZ-100/vSZ 3.X, 1 AP access point	50.92	0.00	Incomplete
8.	1 Year Support for SmartZone 100 with 4 GigE ports	10.00	0.00	Incomplete
9.	1 Year Support for AP license	50.40	0.00	Incomplete
10.	Outdoor Ethernet cable	2.40	0.00	Incomplete
11.	Casing/Capping/ Pipe	9.00	0.00	Incomplete
12.	Laying of Ethernet Cable	12.00	0.00	Incomplete
13.	Laying of Casing/Capping/Pipe	12.00	0.00	Incomplete
14.	Fixing of Access Point	5.55	0.00	Incomplete
15.	GI Pole for RF link	8.00	0.00	Incomplete
16.	Fixing of GI Pole	4.00	0.00	Incomplete
17.	Installation & Configuration	20.00	0.00	Incomplete
18.	Training & Documentation	1.00	0.00	Incomplete
Sub Total		304.00	0.00	

Table 3.1.2 Setting Up of Software Development Centre

S.No.	Item/Facility	Total Funds allocated in Lacs	Funds utilized in Lacs	Status
1.	FOC ITEM: KDK UMSLODSPX BDL KIT SOFTWARE DEVELOPMENT 935186	1.80544	0.00	Incomplete
2.	SMART CARD READER: SDK-ACR122U/130 SOFTWARE DEVELOPMENT KIT ACR122U-A9 SDK V1.30	0.08472	0.00	Incomplete
3.	73694-S01 - KIT E5-262 W/USB, KEYBOARD, SOFTWARE (KEYBOARD) MAKE & BRAND - CISCO (END USE FOR SOFTWARE DEVELOPMENT)	1.12661	0.00	Incomplete
4.	SMART CARD READER: SDK-ACK38U-CCID/V4 SOFTWARE DEVELOPMENT KIT ACR38U-CCID V1.30 -S/N:AR1651,1652.	0.02714	0.00	Incomplete
5.	6U INTEL VPX SINGLE BRD COMPUTER-MODEL NO.VPX6-1957 WITH VME SOFTWARE DEVELOPMENT KIT FOR LINUX-SL.NOS AS PER INVOICE	42.11188	0.00	Incomplete
6.	VMESINGLE BOARD COMPUTER -MODEL NO.SVME-1908 ALONGWITH VME SOFTWARE DEVELOPMENT KIT FOR LINUX SL.NOS.AS PER INV.	3.21303	0.00	Incomplete
7.	VMESINGLE BOARD COMPUTER -MODEL NO.SVME-1908 ALONGWITH VME SOFTWARE DEVELOPMENT KIT FOR LINUX SL.NOS.AS PER INV.	29.51056	0.00	Incomplete
8.	IBM BLUEMIX SOFTWARE DEVELOPMENT 16 INSTANCE 2 GB RS 130000 PER MONTH FOR 2 YEARS	31.20000	0.00	Incomplete
9.	MICROSOFT AZURE ₹ 2,86,647.23 PER MONTH FOR 2 YEARS	68.79552	0.00	Incomplete
10.	WD 16TB WD Sentinel DX4000 Small Business Network File Storage Server iSCSI NAS RS 200000 LAC PER UNIT 05 UNIT	10.00000	0.00	Incomplete
11.	IBM Rational Rose Enterprise Floating User License + Software Subscription & Support 12 Months	20.00000	0.00	Incomplete
12.	Testcomplete software testing & Certification Desktop/Mobile/Web Modules	9.00000	0.00	Incomplete
13.	Dell Precision T1700 MT CTO Base Intel Xeon Processor E3-1241 v3 (Quad Core HT, 3.50GHz Turbo, 8MB) 1 Raid Configuration not over 2 TB 1 Dell Precision T1700 MT Standard 290W TPM Chassis (Thunderbolt Ready) 1 32GB (4x8GB) 1600MHz DDR3 Non-ECC 1 No Media Card Reader	18.00000	0.00	Incomplete

	1 512GB 2.5 inch SATA Solid State Drive 2 No Additional Hard Drive 1 512GB 2.5 inch SATA Solid State Drive (Additional) 1 Integrated Intel SATA Controller 1 No Intel Rapid Start or Smart Connect 1 16x DVD+/-RW Drive			
14.	Andriod display hd 3d screen 53 inch with lan /wifi/hdmi	7.50000	0.00	Incomplete
15.	2 TON SPLIT A/C (3 STAR Rated) FITTED WITH ROTARY COMPRESSOR, WITH STABILIZER	7.62510	0.00	Incomplete
Sub Total		250.00	0.00	

Table 3.1.3 Procurement Of OS And Application Software For The Institute

S.No.	Item/Facility	Total Funds allocated in Lacs	Funds utilized in Lacs	Status
1.	Microsoft Windows Server 2016 cloud server edition	19.00	0.00	Incomplete
2.	Microsoft Visual Studio Professional 2013	2.10	0.00	Incomplete
3.	Microsoft Office 2016	57.00	0.00	Incomplete
4.	Quick Heal Endpoint 3 years subscription	30.00	0.00	Incomplete
5.	Adobe Acrobat PRO DC	100.00	0.00	Incomplete
6.	Adobe illustrator graphics	100.90	0.00	Incomplete
7.	SQL Server 2016	1.00	0.00	Incomplete
Sub Total		310.00	0.00	

Table 3.1.4 Setting up of campus placement Lab/Internet Lab

S.No.	Item/Facility	Total Funds allocated in Lacs	Funds utilized in Lacs	Status
1.	6th Generation Intel® Core™ i5-6400 Processor (6M Cache, up to 3.30 GHz) 8GB Single Channel DDR3L 1600MHz (8GBx1) Windows 10 Home 64-bit English	40.00	0.00	Incomplete
2.	2 TON SPLIT A/C (3 STAR Rated) FITTED WITH ROTARY COMPRESSOR, WITH STABILIZER	1.50	0.00	Incomplete
3.	Server blade with chasis INTEL processor	20.50	0.00	Incomplete
Sub Total		62.00	0.00	

Table 3.1.5 Setting up of forensic Lab (Phase –I)

S.No.	Item/Facility	Total Funds allocated in Lacs	Funds utilized in Lacs	Status
1.	Full cyber forensic kit Image and video forensics, Photo forensics, Data forensics OS forensics, ProDiscover Basic, Volatility, Oxygen Forensic Suite , LastActivityView, XYR software dTective, Authenticate suite, WindowsSCOPE, Ncase, Helix 3 pro	73.00	0.00	Incomplete
2.	Disk and data capture tools with License, File viewers, File analysis tools, Registry analysis tools, Mobile devices analysis tools	2.00	0.00	Incomplete
3.	Analysis Tools with 3 year license & Support	1.00	0.00	Incomplete
4.	Mac OS analysis tools	10.00	0.00	Incomplete
5.	Network forensics tools	0.40	0.00	Incomplete
6.	Database forensics tools	6.00	0.00	Incomplete
7.	Internet analysis tools	1.50	0.00	Incomplete
8.	Email analysis tools	4.00	0.00	Incomplete
9.	WindowsSCOPE Cyber Forensics 3.0	10.00	0.00	Incomplete
10.	Workstations	10.00	0.00	Incomplete
11.	Andriod display hd 3d screen 53 inch with lan /wifi/hdmi	6.00	0.00	Incomplete
12.	Split AC 2 Ton	6.00	0.00	Incomplete
13.	FRED DX 2R workstation System including Tool box & Digital Intelligence Software	26.58158	0.00	Incomplete
14.	MicroSATA Adapter	0.050	0.00	Incomplete
15.	UltraBlock Forensic Card Reader	0.67	0.00	Incomplete
16.	UltraBlock USB3 IDE-SATA Kit	2.60	0.00	Incomplete
17.	Server blade with chasis intel xeon	50.00	0.00	Incomplete
18.	GPU PowerStation with passware kit forensics	13.40	0.00	Incomplete

19.	mSATA and M.2 to SATA Adapter Kit	0.20	0.00	Incomplete
20.	Projector	4.50	0.00	Incomplete
21.	Installation ,training & Maintenance Support 1 year	8.00	0.00	Incomplete
22.	Mobile KIT Heat Gun ,Digitizer Machine ,Soldering Iron ,Screw KIT,Digital Multimeter, Volcani Box	1.00	0.00	Incomplete
23.	Smart Rack	8.09842	0.00	Incomplete
Sub Total		245.00	0.00	-----

Table 3.1.6 Data Centre (NOC ROOM)

S.no	Item/ Facility	Total Funds allocated in Lacs	Funds utilized in Lacs	Status
1	Firewall, Core switch, access switches, Cisco Server	799.00	799.00	Completed
2	Chassis with 8 I/O slots, Old Chassis, X460 10G space upgrade, spares & accessories, edge router, Blade Server.			
Sub Total		799.00	799.00	
Grand Total		2000.00	799.00	

Status of Up gradation of WIFI enabled Campus and Computer Services Centre

Total amount allocated = 1970.00 INR in Lacs

Total amount utilised till date = 799.00 INR in Lacs

Funds required to complete the remaining works = 1171.00 INR in Lacs

Table 3.2 Modernization of Teaching-Learning facilities /Smart classrooms

S. No.	Item/Specifications	Total Funds allocated in Lacs	Funds utilized in Lacs	Status
1.	Interactive Flat Panel	420.00	0.00	Incomplete
2.	Virtual Class Room including capture, recording and streaming online I. Servers one per 05 classrooms II. Desktops III. Pan, tilt and Zoom Cameras including software IV. N-computing for smart classrooms including servers and clients	778.00	0.00	Incomplete
3.	Digital signage panel	20.00	0.00	Incomplete
4.	Seminar halls	200.00	0.00	Incomplete
Grand Total		1418.00	0.00	

Status of Modernization of Teaching-Learning facilities /Smart classrooms

Total amount allocated = 1418.00 INR in Lacs

Total amount utilised till date = 0.00 INR in Lacs

Funds required to complete the remaining works = 1418.00 INR in Lacs

Table 3.3 Up gradation of Institute Library

S. No.	Name of Item/Facility	Total Funds allocated in Lacs	Funds utilized in Lacs	Status
1.	Implementation of RFID			
(i)	Tagging of documents (books/ hard-bound journals/ CDs/ technical films etc) in RFID technology	25.00	0.00	Incomplete
(ii)	Single gate reader for exit (including sensors/ security gate, tags etc complete)	16.00	0.00	Incomplete
(iii)	Three staff stations	9.00	0.00	Incomplete
2.	Subscription of additional E resources (EBooks, e.journal, e.standards etc)			
(i)	Civil Engineering Department, Electrical Engineering Department, Electronics & Common Engineering Department, Mechanical Engineering Department, Metallurgical & Materials Engineering Department, Chemical Engineering Department, Information Technology Department, Computer Science Engineering Department, Mathematics Department, Physics Department, Chemistry Department, Humanities & Management Department, Rest (General)	326.00	326.00	Complete
3.	Purchase of Additional New Books(Hard/Soft-Bound)			
(i)	Civil Engineering Department, Electrical Engineering Department, Electronics & Communication Engineering Department, Mechanical Engineering Department, Metallurgical & Materials Engineering Department, Chemical Engineering Department, Information Technology Department, Computer Science Engineering Department, Mathematics Department, Physics Department, Chemistry Department, Humanities & Management Department, Rest (General)	437.00	0.00	Incomplete
4.	State of the Art facilities like Serves (Especially for the institutional National Repository for National Digital library (NDL), Software's, Acs, Xerox Machines, lamination/binding machines, Computers etc)			
(i)	Library Management and NDL Softwares, Server Machines, Air-Condition Systems, Xerox Machines, Lamination Machines, Binding Machines, Furniture/Furnishing,	437.00	0.00	Incomplete

	Computers, Printers etc			
Grand Total		1250.00	326.00	-----

Status of Up gradation of Institute Library

Total amount allocated = 1250.00 INR in Lacs

Total amount utilised till date = 326.00 INR in Lacs

Funds required to complete the remaining works = 924.00 INR in Lacs

Table 4.0 Campus e-governance Education Management System

S. No.	Details of Items / Works	Total Funds allocated in Lacs	Funds utilized in Lacs	Status
1.	Implementation of All Modules of Integrated ERP Fully Customized as per NIT SRINAGAR Maximum Time Frame : 24 Months Dedicated Onsite Manpower : Min 2 Persons Post Implementation Support under Warranty	107.00	107.00	Under completion
2.	Annual Maintenance contract and technical support for the next 3 years	93.00	0.00	Incomplete
Grand Total		200.00	107.00	

Status of Campus e-governance Education Management System

Total amount allocated = 200.00 INR in Lacs

Total amount utilised till date = 107.00 INR in Lacs

Funds required to complete the remaining works = 93.00 INR in Lacs

5) Up gradation of research and Innovation centres

Table 5.1 Centre Research Facility Centre

S.no	Details of Items / Works	Total Funds allocated in Lacs	Funds utilized in Lacs	Status
1	Nano Mechanical system, Nano Tester and Scratch Adhesion Tester	200.00	200.00	Completed
2	Earthquake Simulator of servo hydraulic system with three Degrees of Freedom, Seismic Plate-form size 2.0 m x 2.0m, maximum payload 5 Tonnes, frequency range.	400.00	400.00	Completed
3	Dynamic light scattering particle size and Zeeta Potential analyzer	85.00	85.00	Completed
4	Up-gradation for existing Renishaw InVia Reflex Raman Spectrometer	35.00	35.00	Completed
5.	<p>Scanning Probe Microscopy A high-resolution imaging system of a Scanning Probe Microscope (SPM) capable of Nanolithography, Nano-manipulation, and Multiple Mode Imaging Techniques (AFM in air and liquid & STM.), the following minimum instrument specifications are required. The instrument should be upgradeable and all possibilities of up gradations.</p> <p>MEASURING MODES: Following measuring modes should be provided by offered specification of device:</p> <p><u>Modes to operate in air:</u></p> <p>a. Contact mode b. Non contact and semi-contact mode</p> <p><u>Modes to operate in liquid:</u></p> <p>a. Contact mode b. Non-contact and semi-contact mode.</p> <p>3.TWO PIEZO TUBE SCANNERS ARE NEEDED (BOTH SHOULD OPERATE IN AIR AND LIQUID):</p> <p>3.1 Small scanner for high resolution and STM: Scanning Range: X YZ: 1 x1 x 1 um</p>	150	0.00	Incomplete

	<p>Non-Linearity XY,: 0.1% Drive resolution: 0.0011 nm Z RMS noise in 1000 Hz bandwidth <0.03 nm XY RMS noise in 200 Hz bandwidth 0.005nm</p> <p>3.2 Large area scanner with closed-loop capacitance sensors: Scanning range: $\geq 90 \times 90 \times 9$ μm (+/-10%) XY RMS noise (with capacitance sensors) : 0.2 nm XY RMS noise (without capacitance sensors) :0.02 nm Z RMS noise in 1000 Hz bandwidth (with capacitance sensors) :0.04 nm Z RMS noise in 1000 Hz bandwidth (without capacitance sensors) :0.03 nm Drive resolution: 0.006 nm</p> <p>4.OPTICAL VIDEO SYSTEM</p> <p>4.1 Top view optical system with possibility to observe cantilever and sample in air and liquid. Side view possibility to control tip to sample approach process is desirable. Optical system should be internationally recognized make.</p> <p>4.2 Resolution 3μm or better</p> <p>4.3 Maximum field of view 4.5x4.5 mm or better.</p> <p>4.4 Magnification on LCD screen 5000x or better.</p> <p>4.5. Color CDD camera and LCD display 20" monitor</p> <p>5. VIBRATION AND ACOUSTIC ISOLATION:</p> <p>5.1 Acoustic enclosure for protection of the sample/tip from acoustic noises, airflows and external noises. Should also enable inert gas operation. The size of the enclosure must allow comfortable operation of the AFM system with optical microscope and all required accessories.</p> <p>5.2 Active Vibration Isolation Table for the AFM system: Active damping (0.6 to 200 Hz) and passive > 200Hz. Table size must be compatible with</p>			
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	<p>the acoustic enclosure. Table must comfortably keep the AFM system and all its accessories while operating.</p> <p>6 CONTROLLER:</p> <p>6.1 PCI ultra fast interface</p> <p>a. Three 24 bit DACs for each channel (X, Y, Z). A single large area scanner (90 microns) must be able to provide small scans (<50x50nm) without artifacts caused by quantization or aliasing. 3 ADC: 16-bit with preamplifiers for each axis X, Y, Z for independent control of bias, scale and offset. 16-bit DAC for Bias Voltage control 12-bit DAC for user output 5 external inputs for user flexibility</p> <p>5 MHz Lock-In amplifier</p> <p>b. Lock-in phase detector having at least four 16-bit analog-to-digital (A/D) converters with software controlled variable gain inputs to digitize the outputs of the lock-ins.</p> <p>c. Controller must provide dual lock-ins, 360 degree quantitative cantilever phase detection, 0 Hz to 5 MHz.</p> <p>d. Supports signal access module (break-out box) for user defined experiments and access to all signals</p> <p>e. Automatic system hardware identification and control of external devices</p> <p>f. Must include self-diagnostic board for automatic testing of the system</p> <p>g. Controller must provide complex feed-forward and feedback algorithms to optimize control of tip-sample forces.</p> <p>h. Determination of resonance frequency, easy setting of resonance amplitude and phase by software</p>			
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	<p>7. SOFTWARE:</p> <p>7.1 Automatic cantilever spring constant calibration required.</p> <p>7.2 Graphical User Interface within software for customized force Measurements: enables design of complex force experiments, implementation of Macro routines etc. Scripting support of user-defined force curve paths. Users have immediate access to all other microscope functions because the interface is self contain within the software and is not an external package. Powerful off-line export and processing tools.</p> <p>7.3 Free life-time software update.</p> <p>7.4 The software must include macro language scripting possibilities for optimization of routine operations and user-defined experiments.</p> <p>7.5 Must include automated system configuration for operation in liquids to operate these modes.</p> <p>7.6 Must include automated system configurations for advanced modes like SKM, MFM etc.</p> <p>7.7 Software must be a sole package for all modes and attachments with no need for additional software programs.</p> <p>7.8 Software package must include both image acquisition and data processing software in one package.</p> <p>7.9 Software must be free-for copy, e.g. can be installed on unlimited number of off-line PCs.</p> <p>Image analysis Windows-based (preferred) software should include at least following features:</p> <ol style="list-style-type: none"> 1. Cross section analysis 2. Roughness measurement <ol style="list-style-type: none"> a. Grain size analysis b. Depth analysis c. Power spectral analysis d. Histogram analysis 			
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	<ul style="list-style-type: none"> e. Fractal analysis f. Fourier analysis g. Image mixing h. Autocorrelation i. Enhanced image filtering tools 			
6	<p>Energy Dispersive X-Ray Fluorescence spectrometeR</p> <p>The Energy Dispersive X-Ray Fluorescence spectrometer must be robust, user-friendly and flexible to analyze solid, powder, liquid samples, and measurement of film thickness as well composition. The spectrometer should be able to do the following general analysis:</p> <ol style="list-style-type: none"> 1. In-built calibration for RoHS(Restriction of hazardous substances /ELV(End of life vehicle), Halogen, and Antimony screening. The result of RoHS/ELV should be shown in excel and HTML format along with the graphs. 2. Thin-film analysis/ plating thickness measurement as well as composition for semiconductors, discs, liquid crystals and solar cells. 3. Ferrous/non-ferrous metal's component analysis and impurity analysis of raw materials, alloys, solder, and precious metals. 4. Analysis of ceramics, cement, glass, bricks, and clay. 5. Analysis of sulfur in oil, additive elements and mixed elements in lubricating oil. 6. Unit should have facility of comparing samples. <p><u>Detailed Technical</u></p>	130.00	0.00	Incomplete

	<p><u>Specifications</u></p> <p>1. X-Ray Generator</p> <p>1.1 The generator should be a 50W system.</p> <p>1.2 The X-ray tube should have a Rhodium or equivalent target for greater X-ray generation efficiency and should be air-cooled.</p> <p>1.3 The tube voltage should have a range of 4 to 50 kV.</p> <p>1.4 The tube current should have a range 1 to 1000 μA.</p> <p>1.5 The generator should have a stability of $\pm 0.01\%$.</p> <p>1.6 The system should have a protection circuit to protect it from a surge in voltage or current. Additionally, the circuit must prevent generation of radiations if the circuit is open at any point.</p> <p>1.7 The exposure area should be variable between at least 1mm - 10mm diameter range. Switching of spot size should be automatic among the settings.</p> <p>2. Detector</p> <p>2.1 The X-ray detector should be of Silicon Drift Detector with high sensitivity and wide dynamic range.</p> <p>2.2 The X-Ray detector should be able to analyze samples in solid, liquid and powder form, as well</p>			
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	<p>as film thickness measurement.</p> <p>2.3 It should be capable of a measurement range from Carbon ($_{11}\text{Na}$) to Uranium ($_{92}\text{U}$).</p> <p>2.4 It should be capable of measuring samples in air, vacuum atmosphere.</p> <p>3. Counting Unit and Control Unit</p> <p>3.1 The counting unit should have a digital signal processing system.</p> <p>3.2 The signal measurement range should be 0 to 40 keV.</p> <p>4. Measurement Compartment Unit</p> <p>4.1 A large sample chamber to accommodate odd sample sizes and shapes of at least 300mmX275mmX100mm .</p> <p>4.2 The measurement compartment should incorporate a CCD camera for accurate selection of target spot for analysis, sample observation and capturing a snapshot of the target spot for reporting, and future reference.</p> <p>4.3 The unit should have a 12-sample turret automatic sequential analysis of multiple samples for greater workflow efficiency and productivity.</p> <p>4.4 The unit should have a</p>			
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	<p>vacuum unit for high-sensitivity analysis of light elements.</p> <p>4.5 The spectrometer should have five primary x-ray filters and one open. This is to</p> <p style="padding-left: 40px;">enable the operator the flexibility to enhance the detection sensitivity of targeted elements of interest. Changing of the filters should be automated.</p> <p>5. Data Management Software</p> <p>5.1 The software should have qualitative and quantitative measurement analysis.</p> <p>5.2 The quantitative analysis software should be capable of performing high accuracy analysis using standard samples and calibration curve.</p> <p>5.3 The quantitative analysis software should also be capable of performing effective analysis where standard samples are not available. This can be used to perform bulk analysis for samples such as oxides, metals and resins. It is effective also for analysis of film-thickness and compositions of coatings and thin films.</p> <p>5.4 The quantitative analysis software should have various correction methods including intensity matrix-</p>			
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	<p>correction, intensity calculation, drift correction, blank correction, internal standard correction and overlap correction.</p> <p>5.5 The software should have a wide array of user-defined utilities such selecting and viewing data, changing data display format, changing a processing profile, editing quantitative conditions, reloading and saving analytical conditions.</p> <p>5.6 The software should have various report templates that can be user editable. The report templates must be able to extract and incorporate data such as image, calibration curve, analytical results and statistical data. The reports must be printable.</p> <p>5.7 The software should have a database comprising a content library and an intensity library. The content library should be editable such as adding, deleting, copying and saving.</p> <p>5.8 The software should be able to analyze the less volume as well irregular shape sample effectively.</p> <p>5.9 The spectrometer should have a content matching software provided as standard.</p> <p>6. Standard Accessories</p> <p>6.1 One set of 6μm-thick</p>			
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	<p>Mylar film consisting at least 500 sheets.</p> <p>6.2 Should be supplied with He purging unit.</p> <p>6.3 Should be supplied with Sample turrent for minimum 10 samples.</p> <p>6.4 One set of 100 sample cells for general purpose applications</p> <p>6.5 One set of start-up kit comprising:</p> <ul style="list-style-type: none"> • One set of five disposal sample cells for general purpose use • One set of five sample cells for general purpose use • One set of five sample cells for trace analysis <p>6.6 One set of desktop computer comprising:</p> <ul style="list-style-type: none"> • 19” LCD Monitor • Intel Core i5 processor or equivalent • 500GB Hard Disk • 4GB RAM • DVD-RW Drive • Preloaded MS Windows 7 Professional edition • MS Office Small Office edition • Keyboard and optical mouse • Color laser printer 			
7	Field scanning Electron Microscope	300.00	0.00	Incomplete

<p><u>1 nm or better @ 30 kV</u> or 1.5 nm or better at @ 15 kV and 3 nm or better @ 1 kV. (Note: there should be at least 1 standard sample for calibration)</p> <p>Lowest X 15 or less Highest X 8,00,000 or more Magnification</p> <p>Suitable vacuum system having Ion Pump, Turbo Pump & Oil free rotary pump.</p> <p>Beam Deceleration/Gentle beam/Beam Booster/ technology or equivalent for high resolution imaging at low kV, Magnetic/Electrostatic objective lens assembly etc. for high resolution imaging of magnetic materials, A stable electron probe in a short time after a specimen exchange.</p> <p>FE-SEM system should be up- gradable to attach the WDS in future.</p> <p>Quoted FE-SEM system should be hooked up with optical microscope. STEM detector with bright field and dark field detectors. (All parties are requested to quote the price for the STEM as an optional item).</p> <p>High resolution printer Compressor Infrared chamber scope (IRCCD) Control panel for adjustment of various SEM functions like focus, magnification etc. Gold / platinum coater Interface between SEM and EDS 3 additional emitter (total 4 nos) Spares (Detail list to be attached with the quote)</p> <p>EDS Detector Liquid nitrogen free Dry Silicon Drift Detector (SDD) vacuum</p>			
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sealed for better light element analysis. Energy resolution 129 eV or better at Mn-K α , Detector area should be ≥ 20 mm ² for handling high count rates Elemental analysis (point and line) and elemental mapping with imaging facility. EDS analysis software Standard sample set for quantitative analysis (for this, supplier may quote separately). External control of detector to avoid collision of the samples.			
Sub Total	1320.00	720.00	

Table 5.2 Innovation , Incubation & Entrepreneurship Development Centre

S.no	Details of Items / Works	Total Funds allocated in Lacs	Funds utilized in Lacs	Status
1.	<p>IT Support Software's AutoCAD Solid Works 2. Desktop Computers (10No.) 3. Printer, scanner 4. Networking (LAN, leased lines, wi-fi, switches etc.) 5. Back up support (UPS, Generator, transformer)</p> <p>a) Manufacturing and Engineering Infrastructure 1. State of the art CNC wood routers, 5 axis 2. 5 axis milling (machining) centre 3. Welding facilities including carbon dioxide welding, TIG/MIG, SPOT welding M/c, GM 4. RP machines (FDM based) 5. Laser 3D scanner 6. Vacuum forging machine</p> <p>b) Chemical engineering Infrastructure</p>	210.00	0.00	Incomplete

1. FTIR			
2. AFM			
3. XRD			
4. Chemical Oxygen demand kit			
5. Biological oxygen demand Kit			
6. Dissolved oxygen kit			
7. Spectro photo metre(UV Viz)			
Sub Total	210.00	0.00	
Grand Total	1530.00	720.00	

Status of Up gradation of research and Innovation centres

Total amount allocated = 1530.00 INR in Lacs

Total amount utilised till date = 720.00 INR in Lacs

Funds required to complete the remaining works = 810.00 INR in Lacs

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