

INFORMATION BROCHURE - 2016

for

Admission to

M.E., M.Tech, M.Pharm, MUP and M.Sc. Programmes

at

**Birla Institute of Technology, Mesra
and
Its Extension Centre, Patna**



BIRLA INSTITUTE OF TECHNOLOGY

(Deemed University under section 3 of UGC Act 1956)

Mesra, Ranchi – 835215

Jharkhand, India

Website: <http://www.bitmesra.ac.in>

The Postgraduate Information Brochure 2016 covers admission to the following postgraduate programmes of the Birla Institute of Technology:

1. M.E. programmes in various disciplines & specializations at BIT Mesra and its Extension Centre, Patna
2. M.Tech programmes in various disciplines at BIT Mesra and its Extension Centre, Patna
3. M.Pharm programme in various specializations at BIT Mesra
4. Master of Urban Planning (MUP) at BIT Mesra
5. M.Sc. programmes in various disciplines at BIT Mesra

The addresses and contact details of the concerned Centres where the above programmes are offered are given below.

Centre	Addresses and contact details
Mesra	Dean, Admissions & Academic Coordination, Birla Institute of Technology, Mesra, Ranchi 835215 Phone: 0651-2275868 (Direct), PBX: 0651-2275444 / 896, Extension- 4469 Fax: 0651- 2276007, 2275401 e-mail: admissions@bitmesra.ac.in
Patna	Director Birla Institute of Technology Extension Centre Near Patna Airport, P.O. Bihar Veterinary College, Patna-800014 Phone: 0612- 2223545, 3200853 Fax: 2227050 e-mail: bitpatna@bitmesra.ac.in

The addresses and contact details of other Extension Centres located in India are as given below.

Deoghar	Director, Birla Institute of Technology Deoghar Extension Centre P.O. – Ratanpur, Jasidih Dist. Deoghar, 814142, Jharkhand Phone: 9334654856 / 9308139037, Telefax: 06432-292565 e-mail: bitdeoghar@bitmesra.ac.in
Jaipur	Director, Birla Institute of Technology Extension Centre 27, Malviya Industrial Area, Jaipur 302017 Phone: 0141– 4019798 / 4019819, Fax: 2751601 e-mail: bitjaipur@bitmesra.ac.in
Lalpur	Director Birla Institute of Technology Extension Centre Lalpur Ranchi 834001, Phone: 0651–2531817 / 2531676, Fax: 2531658 / 2531676 e-mail: bitlalpur@bitmesra.ac.in
Noida	Director, Birla Institute of Technology Extension Centre A-7, Sector-1 Noida 201601 Phone: 0120-2440408 / 4264080/ 4263080 / 2553661 / 3662, Fax: 2554146 e-mail: bitnoida@bitmesra.ac.in

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IMPORTANT DATES

Filling of online form commences from	26 April 2016
Last date for submission of online application	02 June 2016
Last date for receipt of printouts of duly completed online forms at BIT, Mesra	08 June 2016
Tentative date for notification of schedule for Written Test & Counselling / Interviews (on the Institute website only)	20 June 2016
Tentative dates for Written Test and Interviews / Counselling	2nd week of July 2016
Classes will commence from the 25th July 2016 at all Centres	

Note: All the dates mentioned above are tentative, and liable to be changed. Hence, please check our Institute website periodically.

Sec 1. Admission to Postgraduate Programmes 2016 – An Introduction and How to Apply

The Institute offers the following postgraduate programmes at Mesra and its Extension Centre, Patna. Please see the Institute website for brief details about the Institute, Departments, including course structures and syllabi, etc. and Extension Centres.

1. **M.E. programme in various specializations in the following disciplines:** [Duration: 2-year, 4-semester]
 - a) Automated Manufacturing Systems
 - b) Chemical Engineering
 - c) Civil Engineering
 - d) Electrical Engineering
 - (i) Soil Mechanics & Foundation Engineering
 - (ii) Structural Engineering
 - (i) Power Systems (ii) Control Systems
 - (iii) Power Electronics
 - e) Electronics & Communication Engineering
 - f) Mechanical Engineering
 - (i) Instrumentation & Control (ii) Microwave
 - (iii) Wireless Communication
 - (i) Heat Power
 - (ii) Design of Mechanical Equipment
 - g) Software Engineering
 - h) Space Engineering & Rocketry
 - (i) Aerodynamics (ii) Rocket Propulsion
2. **M.E. programme in ECE (Wireless Communication) at BIT Extension Centre, Patna** [Duration: 2-year, 4-semester]
3. **M.Tech programme in the following disciplines:** [Duration: 2-year, 4-semester]
 - a) Biotechnology
 - b) Bio-medical Instrumentation
 - c) Computer Science & Engineering
 - d) Energy Technology
 - e) Environmental Science & Engineering
 - f) Information Security
 - g) Information Technology
 - h) Remote Sensing
4. **M.Tech. programme in Computer Science & Engineering at BIT Extension Centre, Patna** [Duration: 2-year, 4-semester]
5. **M.Pharm programme in the following specializations:** [Duration: 2-year, 4-semester]
 - a) Pharmaceutical Chemistry
 - b) Pharmaceutics
 - c) Pharmacology
 - d) Pharmacognosy
 - e) Clinical Research
 - f) Quality Assurance & Regulatory Affairs
6. **MUP - Master of Urban Planning,** [Duration: 2-year, 4-semester]
7. **M.Sc. programme in the following disciplines,** [Duration: 2-year, 4-semester]
 - a) Chemistry
 - b) Biotechnology
 - c) Geo-Informatics
 - d) Mathematics
 - e) Physics

How to Apply: (Please see Instructions also for details)

- To start online application, click on the link “**Apply Online**”, create ‘**username**’ and ‘**password**’ when prompted. Do not share the username and password with anyone.
- To apply for any programmes listed above, eligible candidates must complete and submit the application online only [link available on Institute website www.bitmesra.ac.in]. Pay application fee of Rs.2,500/- (General / OBC candidates) or Rs.1,500/- (SC/ST candidates) through State Bank Collect - net banking or debit/credit card of any nationalized bank in favour of “**Birla Institute of Technology**” within the given time period. [**Fee once remitted shall not be refunded under any circumstances**].
- Send a printout of the completed form along with required enclosures (see List of Enclosures) by Speed Post / reliable courier (means by which sender may track its movement on internet) to the office of **Dean Admissions & Academic Coordination, Birla Institute of Technology, Mesra, Ranchi – 835215, to reach positively by the due date.**
- Write “Application for PG 2016 on top of the envelope”.
- **Applications reaching us after the due date are liable to be rejected / may not be processed.**

Notes:

1. The candidate may use one application form to apply for ONLY one programme – M.E. or M.Pharm or M.Tech or MUP or M.Sc. etc, and ONLY one discipline within that programme - for example only M.E. in Mechanical or only M.Tech in Computer Science & Engineering or only M.Sc. in Biotechnology.

However, one application form can be used to apply for various specializations within some M.E. programmes (within a department) & within the M.Pharm programme, and in the case of ME (ECE- Wireless Communication) and M.Tech (Computer Science & Engineering) programmes, you may also use one application form to apply for different Places for Study (Centre), in order of preference.

2. Please use separate application form(s) to apply for two or more programmes
3. All candidates in their own interest should keep photocopies of their completed forms for their own reference.

Acknowledgement of receipt of Application Form and Registration Numbers

1. Lists of eligible candidates with registration numbers will be displayed on the Institute website, whose properly completed application forms with all required enclosures have been received within the stipulated time.

2. Candidates must make a note of their registration numbers carefully, as the same will be required at the time of Written Test and Interview / Counselling. **No individual intimation will be sent to candidates.**

3. Candidates, whose names do not appear in the lists of eligible candidates, may contact the Admission Office at Mesra by telephone or fax or email.

The interview / counselling schedules and details of tests (wherever applicable) for the above programmes will be announced by 20th June 2016, only on website and Notice Boards of the Institute at BIT Mesra and the concerned Extension Centres. Candidates are requested to visit the Institute website periodically for updates and any other matter pertaining to the admission procedures. **No individual intimations will be sent to candidates.**

Candidates appearing for final examinations in 2016 can also apply, and if selected can join the programme provisionally. Provisionally selected candidates will be required to sign an undertaking at the time of admission on Non-Judicial Stamp Paper of Rs. 20/- to the effect that if they fail to obtain the requisite marks in graduation / postgraduation their admission will be cancelled. The deadline for submission of mark-sheet / degree certificate is **31 October 2016**, failing which the provisional admission will be cancelled. (Please see Sec 9 for format of the above undertaking).

Sponsored candidates (as per norms of AICTE): A few seats in some programmes are “Sponsored Seats” meant for candidates who are employed in recognized Educational Institutes / Universities / Colleges OR in Government / Defence / Research Laboratories OR in Industry, etc. Such candidates should normally have at least two years of experience. Such candidates must submit their applications in prescribed form, along with a letter of Sponsorship from their Organization.

Sec 2 Eligibility criteria for the M.E., M.Pharm, M.Tech, Master of Urban Planning and M.Sc. Programmes 2016

2 A) Minimum Eligibility Criteria for the M.E. programmes (MEC - PG1):

1. Candidates must hold a B.E. / B.Tech / AMIE or equivalent degree in the appropriate disciplines / branches mentioned below for the respective courses. Candidates must have minimum 55% marks in average (50% for SC/ST) in graduation.

Candidates should preferably be GATE 2015 / GATE 2016 qualified. Non-GATE candidates may also apply. However, their applications will be considered only after applicants who have qualified in GATE have been considered, interviewed.

2. Candidates appearing for final examinations of their Bachelor's programme in 2016 can also apply and if selected can join the programme provisionally. At the time of the interview / counselling they must bring a certificate in original from the Principal of Institute stating that:
 - a) by 30 June 2016, (s)/he will have appeared for examination in all subjects required for obtaining his/her Bachelor's degree.
 - b) (s)/he has obtained requisite marks [55% (50% for SC/ST) upto pre-final year / semester] or equivalent based on latest available grades / marks.

Provisionally selected candidates will be required to sign an undertaking at the time of admission on Non-Judicial Stamp Paper of Rs. 20/- (as format given in Sec-9).

Further, their admission will be confirmed only when they submit the mark sheet and a certificate of having passed the Bachelor's degree / equivalent qualification with at least 55% marks (50% in case of SC/ ST). They must submit proof of passing their final examinations with requisite marks by 31 October 2016. Non-fulfillment of this condition will automatically result in the cancellation of the provisional admission.

3. Candidates with qualifications acquired through correspondence or distance-learning programmes are eligible only if (a) the programmes are recognized by the tripartite panel of AICTE-UGC-DEC, (b) they have passed the qualifying examination at the time of applying, with minimum 55% marks in average (50% for SC/ST) calculated as per item (1) above. They must enclose photocopy of pass certificate and marksheets of qualifying examination with their application [Appearing candidate in distance learning programmes, whose results are yet to be declared, are not eligible to apply].

Please see Selection Procedures for details. Please also see footnote below.

Notes:

(1) Candidates with foreign diplomas should see the EdCIL website for equivalence (<http://www.edcil.co.in>), and if required should obtain an equivalence certificate from the evaluation division of the AIU (website <http://www.aiuweb.org>).

(2) In case any Board / University awards grades instead of marks, the calculation of equivalent marks would be based on the procedure prescribed by the Board / University. In case a University does not have any scheme for converting CGPA into equivalent marks, the equivalence would be established by dividing obtained CGPA with the maximum possible CGPA and multiplying the resultant with 100.

(3) At any level of the studies [class X, class XII or graduation], a candidate / applicant must have passed all the required subjects at that level from the same board/ University.

M.E. Programmes at BIT Mesra & its Extension Centre, Patna:

Other Criteria in addition to the Minimum Eligibility Criteria (MEC - PG1) above:

M.E. Programme (with Department Offering the course)	Specialization(s) offered	Eligible Branches	GATE Scholarships available
Automated Manufacturing Systems (Production Engineering)	-	Production / Manufacturing / Mechanical / Industrial Engineering / Electronics & Communication / Computer Science / Mechatronics / Electrical	Available
Chemical Engineering (Chemical Engineering & Technology)	-	Chemical / Polymer / Metallurgical & Materials / Biotechnology, Food & Biochemical / Chemical Technology or equivalent	Not Available
Civil (Civil & Environmental Engineering)	a) Soil Mechanics & Foundation Engineering	Civil	Available
	b) Structural Engineering	Civil	Available
Electrical (Electrical & Electronics Engineering)	a) Power Systems	Electrical / Electrical & Electronics	Available
	b) Control Systems	Electrical / Electronics & Communication / Electrical & Electronics / Electrical Instrumentation & Control or equivalent	Available
	c) Power Electronics	Electrical / Electrical & Electronics / Electronics & Communication / Instrumentation & Control or equivalent	Available
Electronics & Communication (Electronics & Communication Engineering)	a) Instrumentation & Control	Electronics & Communication / Instrumentation or equivalent	Available
	b) Microwave	Electronics & Communication or equivalent	Available
	c) Wireless Communication	Electronics & Communication or equivalent	Available at Mesra & Patna
Mechanical (Mechanical Engineering)	a) Heat Power	Mechanical / Chemical / Marine	Available
	b) Design of Mechanical Equipment	Mechanical / Production	Available
Software Engineering (Computer Science & Engineering)	-	Computer Science / Information Technology or equivalent	Available
Space Engineering & Rocketry (Space Engineering & Rocketry)	a) Aerodynamics	Mechanical/Aeronautical/ A.M.Ae.S.I. / AMIE or equivalent	Available
	b) Rocket Propulsion	Mechanical / Aeronautical / Chemical / A.M.I.Ch.E. / A.M.Ae.S.I. / AMIE or equivalent	Available

Note: Candidates admitted in M.E. programmes with valid GATE 2015 / GATE 2016 score will be considered to receive scholarships only if approved and amount released by the funding agency.

2 B) Minimum Eligibility Criteria for the M.Pharm programme (MEC - PG2):

1. Candidates must hold a B.Pharm degree from a PCI and AICTE approved Institute. Candidates must have minimum 55% marks in average (50% for SC/ST) in graduation.
Candidates should preferably be GPAT 2016 qualified. Non-GPAT candidates may also apply. However, their applications will be considered only after applicants who have qualified in GPAT have been considered, interviewed (for details, please see the selection procedure).
2. Candidates appearing for final examinations of their Bachelor's programme / qualifying examination in 2016 can also apply and if selected can join the programme provisionally. At the time of the interview / counselling they must bring a certificate in original from the Principal of Institute stating that:
 - a). by 30 June 2016, (s)/he will have appeared for examination in all subjects required for obtaining his/her Bachelor's degree.
 - b). (s)/he has obtained requisite marks [55% (50% for SC/ST) upto pre-final year / semester] or equivalent based on latest available grades / marks.

Provisionally selected candidates will be required to sign an undertaking at the time of admission on Non-Judicial Stamp Paper of Rs. 20/- (as format given in Sec-9).

Further, their admission will be confirmed only when they submit the mark sheet and a certificate of having passed the Bachelor's degree / equivalent qualification with at least 55% marks (50% in case of SC/ ST). They must submit proof of passing their final examinations with requisite marks by 31 October 2016. Non-fulfillment of this condition will automatically result in the cancellation of the provisional admission.

Please see Selection Procedures for details. Please also see footnotes below.

Notes:

(1) Candidates with foreign diplomas should see the EdCIL website for equivalence (<http://www.edcil.co.in>), and if required should obtain an equivalence certificate from the evaluation division of the AIU (website <http://www.aiuweb.org>).

(2) In case any Board / University awards grades instead of marks, the calculation of equivalent marks would be based on the procedure prescribed by the Board / University. In case a University does not have any scheme for converting CGPA into equivalent marks, the equivalence would be established by dividing obtained CGPA with the maximum possible CGPA and multiplying the resultant with 100.

(3) At any level of the studies [class X, class XII, graduation], a candidate / applicant must have passed all the required subjects at that level from the same board/ University.

Other Criteria in addition to the Minimum Eligibility Criteria (MEC – PG2) above:

Name of the Department	Specialization(s) offered	Eligibility	GPAT Scholarship available
Pharmaceutical Science & Technology	M.Pharm in a) Pharmaceutics b) Pharmaceutical Chemistry c) Pharmacognosy d) Pharmacology e) Clinical Research f) Quality Assurance & Regulatory Affairs	Candidate must hold a B.Pharm degree from PCI & AICTE approved Institute	Available

Note: The candidates admitted in M.Pharm programme with valid GPAT 2016 score will be considered to receive scholarships only if approved and amount released by the funding agency.

2 C) Minimum Eligibility Criteria for the M.Tech programmes (MEC - PG3):

1. Candidates must hold EITHER a
 - a). B.E. / B.Tech / AMIE / MCA / equivalent degree in the appropriate disciplines / branches mentioned below for the respective courses, with a minimum 55% marks in average (50% for SC/ST) in graduation / MCA.
OR
 - b). M.Sc. / M.A. degree or equivalent in the appropriate disciplines / branches mentioned below for the respective courses with 55% (50% for SC/ST), after graduating with a Bachelor's Degree or equivalent qualification in 10+2+3 system from a recognized University.

Candidates should preferably be GATE 2015 / GATE 2016 qualified. Non-GATE candidates may also apply. However, their applications will be considered only after applicants who have qualified in GATE have been considered, interviewed.

2. Candidates appearing for final examinations in 2016 can also apply and if selected can join the programme provisionally. At the time of the interview / counselling they must bring a certificate in original from the Principal of Institute stating that:
 - a). by 30 June 2016, (s)/he will have appeared for examination in all subjects required for obtaining his/her qualifying degree.
 - b). He/she has obtained requisite marks or equivalent based on latest available grades / marks.

Provisionally selected candidates will be required to sign an undertaking at the time of admission on Non-Judicial Stamp Paper of Rs. 20/- (as format given in Sec-9).

Further, their admission will be confirmed only when they submit the mark sheet and a certificate of having passed the qualifying examination with requisite marks. They must submit proof of passing their final examinations with requisite marks by 31 October 2016. Non-fulfillment of this condition will automatically result in the cancellation of the provisional admission.

3. Candidates with qualifications acquired through correspondence or distance-learning programmes are eligible only if (a) the programmes are recognized by the tripartite panel of AICTE-UGC-DEC, (b) they have passed the qualifying examination at the time of applying, with minimum requisite marks, calculated as per item (1) above. They must enclose photocopy of pass certificate and marksheets of qualifying examination with their application. [Appearing candidate in distance learning programmes, whose results are yet to be declared, are not eligible to apply].

Please see Selection Procedures for details. Please also see footnote below.

Notes:

(1) Candidates with foreign diplomas should see the EdCIL website for equivalence (<http://www.edcil.co.in>), and if required should obtain an equivalence certificate from the evaluation division of the AIU (website <http://www.aiuweb.org>).

(2) In case any Board / University awards grades instead of marks, the calculation of equivalent marks would be based on the procedure prescribed by the Board / University. In case a University does not have any scheme for converting CGPA into equivalent marks, the equivalence would be established by dividing obtained CGPA with the maximum possible CGPA and multiplying the resultant with 100.

(3) At any level of the studies [class X, class XII, graduation or postgraduation], a candidate / applicant must have passed all the required subjects at that level from the same board/ University.

M.Tech Programmes at BIT Mesra & its Extension Centre, Patna

Other Criteria in addition to the Minimum Eligibility Criteria (MEC - PG3) above:

M.Tech Programme (With Department Offering the course)	Qualifying Examinations / Disciplines Eligible	GATE Scholarships available
Biotechnology (Bio-Engineering)	B.E. / B.Tech in Biotechnology / Biochemical Engineering / Chemical Engineering / Food Technology / B. Pharm or equivalent OR M.Sc. in Biotechnology / Biochemistry / Microbiology / Plant Biotechnology	Available
Bio-Medical Instrumentation (Bio-Engineering)	B.E. / B.Tech in Biomedical / Biotechnology / Computer / Electrical / Electronics / Information Technology / Instrumentation Engineering / B.Pharm / MBBS OR M.Sc. in Biomedical Instrumentation / Computer / Electronics / Information Science / Instrumentation / Physics / Mathematics / Chemistry / Bio Sciences	Not Available
Computer Science & Engineering (Computer Science & Engineering)	B.E. / B.Tech in Computer Science / Information Technology / Electronics / Electrical or equivalent Or MCA or M. Sc in Computer Science or equivalent	Available at Mesra & Patna
Energy Technology (Mechanical Engineering)	B.E. / B.Tech in any discipline / B.Arch OR M.Sc. in Physics / Chemistry / Mathematics	Available
Environmental Science & Engineering (Civil & Environmental Engineering)	B.E./ B.Tech or equivalent in any branch of Engineering OR M.Sc. in Environmental Sciences or equivalent degree in any branch of Life Sciences and Biological Sciences	Available
Information Security (Computer Science & Engineering)	B.E. / B.Tech in Computer Science / Information Technology / Electronics / Or MCA or M.Sc. in Computer Science / Information Technology / Electronics with Mathematics at graduate level	Available
Information Technology (Computer Science & Engineering)	B.E. / B.Tech in Computer Science / Information Technology Or MCA or M.Sc. in Computer Science / Information Technology with Mathematics at graduate level	Available
Remote Sensing (Remote Sensing)	a) B. Arch or B.E. / B.Tech in any branch of Engineering, OR b) Masters degree in Agriculture / Atmospheric Sciences / Botany / Climatology / Chemistry / Computer Applications / Computer Science / Disaster Management / Electronics / Environmental Science / Fisheries / Forestry / Geography / Geology / Geophysics / Geo-Informatics / GIS / Information Science / Mathematics / Meteorology / Oceanography / Physics / Remote Sensing / Soil Science / Statistics / Town Planning / Zoology / allied disciplines c) Candidates must have stereoscopic vision and normal colour vision	Available

Note: Candidates admitted in M.Tech programmes with valid GATE 2015 / GATE 2016 score will be considered to receive scholarships only if approved and amount released by the funding agency.

2 D) Minimum Eligibility Criteria for Master in Urban Planning (MUP) programme (MEC – PG4):

1. Candidates must hold EITHER a
 - a) B.Arch / B.Planning or equivalent or B.E. in Civil Engineering with minimum 55% marks in average (50% for SC/ST) in graduation.
OR
 - b) M.A. / M.Sc. degree or equivalent in Geography, Economics, Sociology or Statistics with 55% marks (50% for SC/ST) after graduating with a Bachelor's Degree or equivalent qualification in 10+2+3 system from a recognized University

Candidates should preferably be GATE 2015 / GATE 2016 qualified. Non-GATE candidates may also apply. However, their applications will be considered only after applicants who have qualified in GATE have been considered, interviewed.

2. Candidates appearing for final examinations in 2016 can also apply and if selected can join the programme provisionally. At the time of the interview / counselling they must bring a certificate in original from the Principal of Institute stating that:
 - a) by 30 June 2016, (s)/he will have appeared for examination in all subjects required for obtaining his/her qualifying degree.
 - b) He/she has obtained requisite marks or equivalent based on latest available grades / marks.

Provisionally selected candidates will be required to sign an undertaking at the time of admission on Non-Judicial Stamp Paper of Rs. 20/- (as format given in Sec-9).

Further, their admission will be confirmed only when they submit the mark sheet and a certificate of having passed the qualifying examination with requisite marks. They must submit proof of passing their final examinations with requisite marks by 31 October 2016. Non-fulfillment of this condition will automatically result in the cancellation of the provisional admission.

3. Candidates with qualifications acquired through correspondence or distance-learning programmes are eligible only if (a) the programmes are recognized by the DEC-IGNOU for M.A./M.Sc. and tripartite panel of AICTE-UGC-DEC for others, (b) they have passed the qualifying examination at the time of applying, with minimum requisite marks, calculated as per item (1) above. They must enclose photocopy of pass certificate and marksheets of qualifying examination with their application [Appearing candidate in distance learning programmes, whose results are yet to be declared, are not eligible to apply].

Please see Selection Procedures for details. Also see footnote below.

Notes:

(1) Candidates with foreign diplomas should see the EdCIL website for equivalence (<http://www.edcil.co.in>), and if required should obtain an equivalence certificate from the evaluation division of the AIU (website <http://www.aiuweb.org>).

(2) In case any Board / University awards grades instead of marks, the calculation of equivalent marks would be based on the procedure prescribed by the Board / University. In case a University does not have any scheme for converting CGPA into equivalent marks, the equivalence would be established by dividing obtained CGPA with the maximum possible CGPA and multiplying the resultant with 100.

(3) At any level of the studies [class X, class XII, graduation or postgraduation], a candidate / applicant must have passed all the required subjects at that level from the same board/ University.

Other Criteria in addition to the Minimum Eligibility Criteria (MEC – PG4) above:

Programme (With Department Offering the course)	Qualifying Examinations / Disciplines Eligible	GATE Scholarship Available
Master in Urban Planning (MUP) (Architecture)	B. Arch / B. Planning or equivalent / B.E. Civil with 55% marks in aggregate (50% for SC/ST), OR M.A. / M.Sc. Geography, Economics, Sociology or Statistics with 55% marks (50% for SC/ST)	Available

Note: Candidates admitted in MUP programme with valid GATE 2015 / GATE 2016 score will be considered to receive scholarships only if approved and amount released by the funding agency.

2 E) Minimum Eligibility Criteria for the M.Sc. programmes offered at BIT Mesra (MEC – PG5):

1. Candidates must hold a Bachelor's Degree or equivalent qualification of any of the Universities incorporated by an act of the central or state legislatures in India or other educational institutions established by an act of Parliament or declared to be deemed as a University under section 3 of UGC Act, 1956, or possess an equivalent qualification recognized by the Ministry of HRD, Government of India / AIU. This degree must entail a minimum of three years of education after completing higher secondary schooling [Class 12 or equivalent] (10+2+3 system).
2. Candidates of B.Sc. / B.A. Honours must have minimum 55% marks in average (50% for SC/ST) in their Honours subject. Candidates of other graduate courses must have minimum 55% marks in average (50% for SC/ST) in graduation.
3. Candidates appearing for final examinations of their Bachelor's programme in 2016 can also apply and if selected can join the programme provisionally. At the time of the counselling they must bring a certificate in original from the Principal of Institute stating that:
 - a). by 30 June 2016, she/he will have appeared for examination in all subjects required for obtaining his/her qualifying degree.
 - b). He/she has obtained requisite marks or equivalent based on latest available grades / marks.

Provisionally selected candidates will be required to sign an undertaking at the time of admission on Non-Judicial Stamp Paper of Rs. 20/- (as format given in Sec-9).

Further, their admission will be confirmed only when they submit the mark sheet and a certificate of having passed the Bachelor's degree / equivalent qualification with at least 55% marks (50% in case of SC/ ST). They must submit proof of passing their final examinations with requisite marks by 31 October 2016. Non-fulfillment of this condition will automatically result in the cancellation of the provisional admission.

4. Candidates with qualifications acquired through correspondence or distance-learning programmes are eligible only if (a) the programmes are recognized by the DEC-IGNOU, (b) they have passed the qualifying examination at the time of applying, with minimum 55% marks in average (50% for SC/ST) calculated as per item (2) above. They must enclose photocopy of pass certificate and marksheets of qualifying examination with their application [Appearing candidate in distance learning programmes, whose results are yet to be declared, are not eligible to apply].

Notes:

(1) Candidates with foreign diplomas should see the EdCIL website for equivalence (<http://www.edcil.co.in>), and if required should obtain an equivalence certificate from the evaluation division of the AIU (website <http://www.aiuweb.org>).

(2) In case any Board / University awards grades instead of marks, the calculation of equivalent marks would be based on the procedure prescribed by the Board / University. In case a University does not have any scheme for converting CGPA into equivalent marks, the equivalence would be established by dividing obtained CGPA with the maximum possible CGPA and multiplying the resultant with 100.

(3) At any level of the studies [class X, class XII or graduation], a candidate / applicant must have passed all the required subjects at that level from the same board/ University.

Other Criteria in addition to the Minimum Eligibility Criteria (MEC – PG5) above

S.No.	M.Sc. Programme (With Department Offering the course)	Qualifying Examinations / Disciplines Eligible
1	Biotechnology (Bio-Engineering)	B.Sc. with Biotechnology / Physical / Chemical / Biological / Agricultural / Pharmaceutical or equivalent
2	Chemistry (Chemistry)	B.Sc. with Chemistry, Physics, Mathematics or equivalent and Mathematics as a subject at Class 12 level
3	Geoinformatics (Remote Sensing)	a) Graduate in Agriculture / Atmospheric Sciences / Botany / Chemistry / Computer Applications / Computer Science / Disaster Management / Ecology & Environmental Sciences / Fisheries / Forestry / Geography / Geology / GIS / Information Science / Mathematics / Oceanography / Physics / Soil Science / Statistics / Town Planning / Zoology / allied disciplines b) Candidates must have stereoscopic vision and normal colour vision
4	Mathematics (Mathematics)	B.Sc. with Mathematics, Physics, Chemistry or equivalent
5	Physics (Physics)	B.Sc. Honours with Physics, Chemistry, Mathematics or Physics, Chemistry, Statistics or equivalent

No scholarships are available for these programmes.

Sec 3. Selection Procedures, Expected Dates of Tests & Interviews / Counselling

(A) Selection Procedures for the M.E., M.Tech, and MUP programmes:

GATE qualified candidates: Provisional selections to the M.E., M.Tech and MUP programmes will be on the basis of scores obtained in GATE 2015 / GATE 2016, previous academic record and personal interviews / counselling, provided that the candidates fulfill the eligibility criteria mentioned in Sec – 2A, 2C & 2D.

Non-GATE candidates: Provisional selections of Non-GATE candidates will be on the basis of written test, previous academic record and personal interviews / counselling, provided that the candidates fulfill the eligibility criteria mentioned in Sec – 2A, 2C & 2D. However, their admission will be considered only after applicants who have qualified in GATE 2015 / GATE 2016 have been considered and admitted, subject to the availability of seats. **There will be no scholarships for these candidates.** Syllabus of the test will be same as for GATE.

(B) Selection Procedures for the M.Pharm programme:

GPAT Qualified candidates: Provisional selections to the M.Pharm programme in Pharmaceutical Chemistry, Pharmaceutics, Pharmacognosy, Pharmacology, Clinical Research and Quality Assurance & Regulatory Affairs will be on the basis of scores obtained in GPAT 2016, and previous academic record and personal interviews / counselling, provided that the candidates fulfill the eligibility criteria mentioned in Sec 2B.

Non-GPAT candidates: Provisional selections of Non-GPAT candidates will be on the basis of written test, previous academic record and personal interviews / counselling, provided that the candidates fulfill the eligibility criteria mentioned in Sec-2B. However, their admission will be considered only after applicants who have qualified in GPAT 2016 have been considered and admitted, subject to the availability of seats. **There will be no scholarships for these candidates.** Syllabus of the test will be same as for GPAT.

(C) Selection Procedures for the M.Sc. programmes: Provisional selections to the M.Sc. programmes will be on the basis of previous academic record and counselling provided that the candidates fulfill the eligibility criteria mentioned in Sec-2E. **There will be no scholarships for students of these programmes.**

[Note: Admission of Non-GATE / Non-GPAT candidates will be considered only after applicants who have qualified in GATE 2015 or GATE 2016 / GPAT 2016 have been considered and admitted, subject to the availability of seats].

Candidates admitted in M.E. / M.Tech / MUP with valid GATE 2015 or GATE 2016 and M.Pharm with valid GPAT 2016 score will be considered to receive scholarships only if approved and amount released by the funding agency (see also footnotes in Section 3).

Candidates must visit our website <http://www.bitmesra.ac.in> occasionally for updates / any other matters related to admission procedures.

Cancellation of Admission Offer:

- The admission of a candidate will be automatically cancelled,
 - (a) if any information provided in the application form is found incorrect or missing.
 - (b) those who fail to submit the marksheet of Class XII or equivalent qualifying examination in time as stipulated.

Expected Dates of Written tests / interviews / counselling for all programmes:

Interview / counselling schedules and details of written tests (wherever applicable) for the above programmes will be announced by 20th June 2016, only on the Institute website and Notice Boards of the Institute at BIT Mesra and its concerned Extension Centres. Candidates must visit our website periodically for updates and any other matter related to the admission procedures. No individual intimations will be sent to candidates.

The written tests (wherever applicable) and counselling / interviews of eligible candidates will start from the 2nd week of July 2016.

Note, FOR:-

- 1. M.E. - ECE (Wireless Communication) - the written test and interview / counselling will be held at BIT Mesra and BIT Patna Centres, based on candidate's first choice of Place for Study (Centre).**
- 2. M.Tech (Computer Science & Engineering) - the written test and interview / counselling will be held at BIT Mesra and BIT Patna Centres, based on candidate's first choice of Place for Study (Centre).**

Provisional selection lists, along with procedures for admissions, will be notified the day after the interviews / counselling, on the Institute website and Notice Boards of the Institute / its concerned Extension Centre only. **No separate intimations will be sent to candidates.**

Provisionally selected candidates will be required to take admission by the date given, failing which vacant seats may be allotted to waitlisted candidates. The list of waitlisted candidates will also be announced on our website and Institute Notice Boards only. **No separate intimations will be sent to candidates.**

Candidates must visit our website <http://www.bitmesra.ac.in> occasionally for updates / any other matters related to admission procedures.

Documents required at the time of counselling / interviews and admission

Candidates must carry the originals of the following documents at the time of reporting for counselling / interviews and admission, as well as one set of photocopies:

1. Pass certificate of Class 10 for proof of age
2. Marksheet of Class 10
3. Marksheet of Class 12 / Intermediate or equivalent
4. Certificates and marksheets of Graduation / qualifying examination

OR

Marksheets upto pre-final year for appearing candidates of graduation / qualifying examination in 2016. They must bring a certificate in original from the Principal of Institute stating that:

- a). by 30 June 2016, (s)/he will have appeared for examination in all subjects required for obtaining his/her qualifying degree.
 - b). (s)/he has obtained requisite marks or equivalent based on latest available grades / marks.
5. **Candidates with qualifications acquired through correspondence or distance-learning programmes must carry proof of pass certificate, marksheets of qualifying examination and approval of DEC (Distance Education Council).**
 6. GATE 2015 / GATE 2016 Admit card and Score card for M.E. / M.Tech and MUP programmes (if applicable).
 7. GPAT 2016 Admit card and Score card for M.Pharm programme (if applicable)
 8. Caste certificate / special category certificate (if applicable).
 9. **GPA to Percentage Conversion formula duly attested by Head of the Institute/ Principal/ HOD.**
 10. One passport size photograph – same as uploaded on application form
 11. Photo identification: (Driving license, Passport, PAN Card, Voter ID, Aadhaar Card, College ID, Employee Identification Card are acceptable).

They should also carry a photocopy of their duly completed form.

Documents required at the time of admission:

If provisionally selected, candidates will be required to submit all the above documents in original (except the Photo ID) at the time of admission, along with the requisite fees.

Provisionally selected candidates appearing for final examinations in 2016 will be required to sign an undertaking at the time of admission on Non-Judicial Stamp Paper of Rs. 20/- to the effect that if they fail to obtain the requisite marks in graduation / postgraduation their admission will be cancelled. The deadline for submission of marksheet / degree certificate is 31 October 2016, failing which the provisional admission will be cancelled. (Please see Sec 9 for format of the above undertaking).

Note: Eligible SC/ST and PwD students admitted to above programmes 2016 at Mesra and its Extension Centres, should submit their scholarship form in the Office of Registrar, for the academic year by February for processing scholarship to SC/ST and PwD students each year, as per UGC guidelines.

Sec 4. Number of seats for M.E. / M.Tech / M.Pharm / MUP / M.Sc. programmes, GATE / GPAT Scholarships\$, Reservations

TABLE 1: Number of seats

Programmes	Total Seats*
(A) M.E. Programmes (4-Semester) at Mesra	
Automated Manufacturing Systems	25
Chemical Engineering **	18
Civil (Soil Mechanics & Foundation Engineering – 12, Structural Engineering –12)	24
Electrical (Control Systems – 12, Power Systems – 12, Power Electronics – 18)	42
Electronics & Communication (Instrumentation & Control – 12, Microwave – 12, Wireless Communication – 18)	42
Mechanical (Heat Power – 12, Design of Mechanical Equipment – 12)	24
Software Engineering	15
Space Engineering & Rocketry (Aerodynamics – 12, Rocket Propulsion – 12)	24

(B) M.E. Programme (4-Semester) at BIT Extension Centre, Patna	
Electronics & Communication (Wireless Communications)	18

(C) M. Tech Programmes (4-Semester) at Mesra	
Biotechnology	18
Bio-medical Instrumentation **	18
Computer Science & Engineering	16
Energy Technology	18
Environmental Science & Engineering	18
Information Technology	18
Information Security	18
Remote Sensing	18

(D) M.Tech Programme (4-Semester) at BIT Extension Centre, Patna	
Computer Science & Engineering	18

(E) M. Pharm Programme (4-Semester) at Mesra	
M. Pharm (Pharmaceutics-18, Pharmaceutical Chemistry-18, Pharmacology-18, Pharmacognosy-6, Clinical Research -12, Quality Assurance and Regulatory Affairs-12)	84
M. Pharm. Programme under Q.I.P.	8

(F) Master of Urban Planning (MUP) Programme(4-Semester) at Mesra	12
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\$Candidates admitted in M.E. / M.Tech / MUP with valid GATE 2015 / GATE 2016 score and M.Pharm with valid GPAT 2016 score will be considered to receive scholarships only if approved and amount released by funding agency.

*The total number of seats in a programme includes the sponsored seats and indicates the maximum sanctioned strength.

No scholarships are available for these programmes (AICTE approval applied for)

(G) M.Sc. Programmes	Total Seats
M.Sc. in Biotechnology (4-Semester)	30
M.Sc. in Chemistry (4-Semester)	15
M.Sc. in Geoinformatics (4-Semester)	20
M.Sc. in Mathematics (4-Semester)	15
M.Sc. in Physics (4-Semester)	15

No scholarships are available for M.Sc. programmes

Sponsored candidates: A few seats in some programmes are “Sponsored Seats” meant for candidates who are employed in recognized Educational Institutes / Universities / Colleges OR in Government / Defence / Research Laboratories OR in Industry, etc. Such candidates should normally have at least two years of experience. Such candidates must submit their applications in prescribed form, along with a letter of Sponsorship from their Organization.

The Institute reserves the right to lower the intake in a programme without showing any reason.

The Institute also reserves the right not to offer a particular programme in case the number of students found to be eligible to be admitted is less than 30% in number.

Reservations:

1. For all programmes at the Institute which are supported by any of the respective State Governments, the reservation criteria for the state quota are as per the norms of the respective State Government.
2. For all other programmes the reservation criteria for SC & ST are as per the statutory norms of Central Govt. (SC -15% & ST - 7.5%)
3. The Institute observes statutory reservation for Persons with Disability (3%).
4. Upto 1 seat at all Centres in each programme is reserved for candidates who are Sons or Daughters of Kashmiri Migrant who otherwise have qualified for admissions.
5. At Mesra 50% of the total seats are reserved for candidates from Jharkhand State, and the remaining 50% of the total seats are distributed in the rest of the states. The domicile of a candidate for the purpose shall be determined on the basis of place of passing his/her qualifying examination (the location of his/her Institute).

[In case sufficient numbers of suitable candidates from any group are not available, the Institute reserves the right to fill the seats from the other group].

However the final reservation proportion will depend on notification, if any, issued by competent authority and as accepted by the Institute.

Sec 5. Financial Information and fees payable 2016

TABLE 2 (a): Fees payable for M.E., M.Tech, M.Pharm and MUP Programmes at Mesra

Fee payable at the time of admission and in each subsequent semester

Particulars	1st Sem	2nd Sem	3rd Sem	4th Sem
Tuition Fee	73500	73500	81000	81000
Development Fee	5000	5000	5500	5500
Institute Exam Fee	4500	4500	5000	5000
Total :	83000	83000	91500	91500

Hostel Seat Rent*, Electricity and Transport etc.	13500	13500	14500	14500
G. Total:	96500	96500	106000	106000

* Hostel fees are subject to revision in future

Additional amount to be paid at the time of admission:	Total Rs.25,000.00
(i) Admission Fee (One time only) =Rs.15,000.00 and	
(ii) Caution Money (One time only-Refundable)=Rs.10,000.00	

Notes:

- Hostel mess charges at BIT Mesra will range from approximately Rs. 2,000/- to Rs. 3,000/- per month. **Students at Mesra will be required to deposit Hostel Caution Money* (One Time only - Refundable) of Rs.5,000/- .They will also be required to pay suitable mess advance at the beginning of each semester, which will be adjusted against their mess charges. For the July 2016 session, this mess advance will be Rs. 20,000/-.**

*Hostel Caution Money (One Time only - Refundable) and Hostel Mess Advance (each semester) are payable by crossed Demand Draft in favour of **“BIT Hostels Mess Account”** payable at **Ranchi**.

- Other fees must be paid by crossed Demand Draft in favour of **“Birla Institute of Technology”** payable at **Ranchi**.
- Students will be expected to provide themselves with stationery and textbooks, etc, as prescribed for different subjects.
- The Institute reserves the right to revise the fees and other charges at any stage.
- For rules regarding refund of fees on withdrawal, please see separate Notice on Notice Boards.

Financial Information and fees payable 2016

TABLE 2 (b): Fees payable for M.Sc. Programmes at Mesra

(I) Fee payable at the time of admission and in each subsequent semester for M.Sc. in Chemistry, Mathematics and Physics programmes at Mesra

Particulars	1st Sem	2nd Sem	3rd Sem	4th Sem
Tuition Fee	35500	35500	38500	38500
Development Fee	2500	2500	3000	3000
Institute Exam Fee	4500	4500	5000	5000
Total :	42500	42500	46500	46500

Hostel Seat Rent*, Electricity and Transport etc.	13500	13500	14500	14500
G. Total:	56000	56000	61000	61000

* Hostel fees are subject to revision in future

Additional amount to be paid at the time of admission:	Total Rs.25,000.00
(i) Admission Fee (One time only) =Rs. 15,000.00 and	
(ii) Caution Money (One time only-Refundable)=Rs. 10,000.00	

(II) Fee payable at the time of admission and in each subsequent semester for M.Sc. in Biotechnology, and Geo-informatics programmes at Mesra

Particulars	1st Sem	2nd Sem	3rd Sem	4th Sem
Tuition Fee	53500	53500	59000	59000
Development Fee	4000	4000	4500	4500
Institute Exam Fee	4500	4500	5000	5000
Total :	62000	62000	68500	68500

Hostel Seat Rent*, Electricity and Transport etc.	13500	13500	14500	14500
G. Total:	75500	75500	83000	83000

* Hostel fees are subject to revision in future

Additional amount to be paid at the time of admission:	Total Rs.25,000.00
(i) Admission Fee (One time only) =Rs. 15,000.00 and	
(ii) Caution Money (One time only-Refundable)=Rs. 10,000.00	

Notes:

- Hostel mess charges at BIT Mesra will range from approximately Rs. 2,000/- to Rs. 3,000/- per month. **Students at Mesra will be required to deposit Hostel Caution Money* (One Time only - Refundable) of Rs.5,000/-.** They will also be required to pay suitable mess advance at the beginning of each semester, which will be adjusted against their mess charges. For the July 2016 session, this mess advance will be Rs. 20,000/-.

*Hostel Caution Money (One Time only - Refundable) and Hostel Mess Advance (each semester) are payable by crossed Demand Draft in favour of **“BIT Hostels Mess Account”** payable at **Ranchi**.

- Other fees must be paid by crossed Demand Draft in favour of **“Birla Institute of Technology”** payable at **Ranchi**.
- Students will be expected to provide themselves with stationery and textbooks, etc, as prescribed for different subjects.
- The Institute reserves the right to revise the fees and other charges at any stage.
- For rules regarding refund of fees on withdrawal, please see separate Notice on Notice Boards.

Financial Information and fees payable 2016

TABLE 2 (c): Fees payable for M.E. / M.Tech Programme at BIT Extension Centre, Patna

(I) Fee payable at the time of admission and in each subsequent semester

Particulars	1st Sem	2nd Sem	3rd Sem	4th Sem
Tuition Fee	73500	73500	81000	81000
Development Fee	5000	5000	5500	5500
Institute Exam Fee	4500	4500	5000	5000
Total :	83000	83000	91500	91500

Hostel Seat Rent* and Electricity etc.	13000	13000	14000	14000
G. Total:	96000	96000	105500	105500

* Hostel fees are subject to revision in future

Additional amount to be paid at the time of admission:		Total Rs.25,000.00
(i) Admission Fee (One time only) =Rs.15,000.00 and		
(ii) Caution Money (One time only-Refundable)=Rs.10,000.00		

Notes:

- Hostel mess charges at BIT Patna will range from approximately Rs. 2,000/- to Rs. 3,000/- per month. **Students admitted at BIT Patna will be required to deposit Hostel Caution Money* (One Time only - Refundable) of Rs.5,000/- .They will also be required to pay suitable mess advance at the beginning of each semester, which will be adjusted against their mess charges. For the July 2016 session, this mess advance will be Rs. 15,000/- (boys), Rs. 10,000/- (Girls).**
- All fees must be paid by crossed Demand Draft in favour of **“Birla Institute of Technology”** payable at **Patna**.
- Students will be expected to provide themselves with stationery and textbooks, etc, as prescribed for different subjects.
- The Institute reserves the right to revise the fees and other charges at any stage.
- For rules regarding refund of fees on withdrawal, please see separate Notice on Notice Boards.

Sec 6. List of enclosures to be submitted along with the completed application form

1. A print-out of the duly completed online form
2. One recent colour photograph – same as uploaded on form (attached by clip)
3. **Payment receipt towards application fee of Rs.2,500/- (General / OBC) and Rs.1,500/- (SC/ST) candidates (non-refundable)**
4. **A set of photocopies of certificates** as listed below: (write your Name, telephone number and programme applying for, on the back of each of these papers):
 - a) Pass certificate of Class 10
 - b) Marksheet of Class 10
 - c) Marksheet of Class 12 / Intermediate or equivalent
 - d) Certificates and marksheets of Graduation / qualifying examinationOR
Marksheets upto pre-final year for appearing candidates of graduation / qualifying examination in 2016. They must enclose photocopy of certificate from the Principal of Institute stating that:
 - a) by 30 June 2016, (s)/he will have appeared for examination in all subjects required for obtaining his/her qualifying degree.
 - b) (s)/he has obtained requisite marks or equivalent based on latest available grades / marks.
- e) **Candidates with qualifications acquired through correspondence or distance-learning programmes must enclose with their application a photocopy of pass certificate, marksheets of qualifying examination showing that they have passed the qualifying examination with requisite marks and approval of DEC (Distance Education Council) [Appearing candidate in distance learning programmes, whose results are yet to be declared, are not eligible to apply].**
- f) Admit Card of GATE 2015 or GATE 2016 / GPAT 2016 (if applicable)
- g) Score Card of GATE 2015 or GATE 2016 / GPAT 2016 (if applicable)
- h) Caste certificate (if applicable), which **should be in proper format and signed by appropriate authority of rank not less than SDO.**
- i) Candidates belonging to other special categories mentioned in Sec 4 (Person with Disability [PwD] / Kashmiri Migrant) must provide photocopy of certificate in proper format from appropriate authority.
- j) GPA to Percentage Conversion formula duly attested by Head of the Institute/ Principal/ HOD.
- k) Photo identification: (Driving license, Passport, PAN Card, Voter ID, Aadhaar Card, College ID, Employee Identification Card are acceptable)

Incomplete applications or applications received without all required enclosures are liable to be rejected / may not be processed.

Sec 7. Profile of the Departments

Department of Architecture

The Department was established in 1993 with a vision to develop professional architects and to promote research and consultancy activities in the areas of architecture, conservation, landscaping, urban design, urban planning etc.

Birla Institute of Technology, Mesra, Ranchi is the only institute in Jharkhand that offers Undergraduate course in Architecture (B Arch) as well as Postgraduate course in Urban Planning (MUP) and PhD level program in Architecture and Planning.

Programmes offered	Intake
Bachelor of Architecture (B.Arch) - 5 years (10 semesters)	40
Master in Urban Planning (MUP) - 2 years (4 semesters)	12
Ph.D. programme in architecture and planning	

The 5-year Bachelor Degree in architecture programme is approved by the Council of Architecture, India (COA) and is also approved by All India Council of Technical Education (AICTE).

The Department is recipient of UGC assistance in the form of departmental research support under the special assistance programme (SAP) of the UGC.

Architecture is primarily the art and science of designing spaces for serving the multifarious activities of human beings and for meeting their specific needs in a meaningfully built environment. Architecture uses the philosophic wholesomeness of humanities, the logical rationalism of science, the passionate imagination of art and the inexhaustible resources of technology. It calls for originality, creativity, conceptualization, perception, aesthetic values and a holistic judgment of people, places, objects and events. The course structure is designed to fulfill the above requirements of the profession. Graduate students have found gainful employment in design consultancy and construction sector. Many of our students have opted for higher studies in India and abroad in many related disciplines, such as, urban design, city planning, landscape architecture, conservation and construction management and even other diversified fields, such as, visual design, product design, management and software development related with architecture.

The MUP programme is designed to fulfill the great need of formal training requirement for holistic fulfillment of the duties of urban local bodies in the area of urban development, planning, town planning schemes and implementation of such development plans or living in urban settlements and various tools and techniques used for planning and management of the development process.

Since its inception, the department has contributed to the field of architecture and urban studies through an array of seminars, conferences, workshop and training courses at both national and international level. The department in association with the civil engineering department of the institute is identified as state level research centre/institution for conducting training programme for Capacity Building of Architects / Engineers in Earthquake Risk Management. The Department has signed a MoU with INTACH (Indian National Trust for Art and Culture Heritage) for conservation and upkeep of heritage properties of Jharkhand.

In 2006 the Department started publication of "ABACUS: An Internationally Refereed Bi-annual Journal on Architecture, Conservation and Urban Studies" (ISSN: 0973-8339), which is continued by researches across the globe and gained the reputation over time.

The Architecture Department of BIT, Mesra closely cooperates with many departments of the Government of Jharkhand, notably, in the field of Urban Development, Building Construction and Disaster Management. The Department has conducted seminars and workshops in association with many departments of the Government and provide consultancy as and when sought. Faculty members are actively involved in various committees of the State Government in the Architecture and Planning related activities. They are also resource persons for the various QIP activities of the 'Administrative Training Institute' of the State Government at Ranchi.

The Department is involved in development of e-content for six architectural subjects at the undergraduate level the sanctioned project "Development suitable pedagogical methods for various classes, intellectual calibers and e-learning" anchored by IIT, Kharapur under the 'SAKSHAT' scheme of the

Department/School of Architecture to develop content for all six sanctioned architectural subjects as a part of the pilot project.

The faculty members contribute to the development of the subject area through research activities and contribution of papers and articles in national and international journals, and stay abreast with up-to-date academic development through participation in short term courses, seminars, conferences and workshops.

In order to respond to the social obligation, the department regularly provides consultancy in preparation of architectural design schemes, interior design schemes, landscaping schemes, architectural conservation schemes and several social projects along with city development plans.

Students of the Department have won many prizes at the various Zonal and National meets of the National Association of students of Architecture (NASA) over the years. Students win many prizes in national and international competitions as well. The department is ranking among top ten best architectural colleges in the country by Outlook Express through a nationwide survey.

Alumni of the Department are engaged in various top ranking consultancy organizations, and some of them have already established themselves as successful entrepreneur by owning architectural firms. However, some of them have preferred to take up higher studies in India and abroad. Thereby spread the legacy of the Department and the Institute to rest of the world.

Department of Bio-Engineering

The Department of Bioengineering, renamed in 2014, was established in 2002 as Dept. of Biotechnology with financial support from the Department of Agriculture, Government of Jharkhand, with objectives like providing education and training facilities, carrying out application oriented research, developing in-house technologies and promoting consultancy services in various areas of Biotechnology.

Programmes Offered	Intake
B.E. Biotechnology - 4 years (8 semesters)	60
M.Tech. Biotechnology - 2 years (4 semesters)	18
M.Tech. Bio-Medical Instrumentation - 2 years (4 semesters)	18
M.Sc. Biotechnology - 2 years (4 semesters)	30
Ph.D. Programme	

The Vision & Mission of the Department are-

Vision of the Department:

- The Department of Bioengineering has a vision to impart international standard quality education in the field of Bio- science, Bio-technology and Bio-engineering.

Mission of the Department:

- To create state-of-the-art infrastructure for Research and Training in Biotechnology and Bioengineering.
- To provide globally acceptable technical education in Bio- science, Bio-technology and Bio-engineering.
- To nurture graduates for innovation and creativity in the field of Bio- science, Bio-technology and Bio-engineering having ethical and social concern.
- To promote collaboration with Academia, Industries and Research Organizations at National and International level.
- To contribute to socioeconomic development through education and bioentrepreneurship.

The different programmes seek to provide students with education and training in:

- Scientific principles and knowledge underlying advances in bioengineering
- Basic laboratory techniques in research and development
- Legal and intellectual property issues
- Tools involved in bioinformatics, imaging and signal processing
- Skill and attributes important in business and bioentrepreneurship

Further the learning approach encourages team spirit and leadership quality among students to prepare them for challenging careers, including:

- Research positions in laboratories
- Biotech industries including biopharmaceuticals, medical devices
- Careers in biotechnology applications
- Management positions in bioengineering sector
- Careers with Law firms in biotechnology
- Software development and management

Department at a Glance:

- Independent building about 35000 sq. ft.
- 12 well equipped high end research laboratories dedicated to carry out basic and advanced research in the field of Molecular Biology, Genetic Engineering and Cell Biology, Plant and Animal Biotechnology, Microbiology, Biochemistry, Proteomics, Bioinformatics, Bioprocess Engineering, Chemical Engineering, Environmental Biotechnology, Biomedical Instrumentation and Imaging.
- A Center of Excellence (CoE) under TEQIP, Phase II sponsored by World Bank, BTISnet SubDIC Bioinformatics center for Jharkhand.
- More than 50 externally funded projects from funding agencies like DST, DBT, DST-SERB, UGC, AICTE, ICMR, CSIR, NAIP, MoFPI etc.
- A mixed and balanced well recognized faculty members with rich academic and research profile.
- All faculties with minimum Doctoral degree. Dept. provides high end computational software/platform for students.

Department of Chemical Engineering & Technology

The Department of Chemical Engineering & Technology with well qualified faculty provides high standard of education in the diversified fields of Chemical Engineering and Chemical Technology. The Department received national recognition by winning the Gold Trophy for Plastics Award 2012 in the category of Best Educational Institution Contributing to Plastics. The Plastics Award was conferred on 1st February 2012, at 8th International Plastics Exhibition and conference. The programme was supported by Ministry of Chemicals and Fertilizers, Department of Chemicals and Petrochemicals, Government of India. Faculty members are working on sponsored projects and collaborative research with various organizations. The Department is also recognized under DST-FIST. Department is recipient of a major grant from Ministry of Food Processing Technology, Govt. of India, for infrastructure development for programmes in Food Technology.

Programmes Offered	Intake
B.E. in Chemical Engineering - 4 years (8 semesters)	60
B.E. in Chemical Engineering (Plastic and Polymer) - 4 years (8 semesters)	60
M.E. in Chemical Engineering - 2 years (4 semesters)	18
Integrated M.Sc. in Food Technology - 5 years (10 semesters) with exit option after three years	20
Ph.D. Programmes	

Vision of the Department:

The Department of Chemical Engineering & Technology aspires to be a centre of excellence for the provision of instruction, teaching, training, and research in the areas of chemical engineering & polymer science and engineering. It aims to advance and disseminate knowledge in the above areas, provide an enriched academic environment in undergraduate and graduate education, build partnerships and collaborative relationships, and respond to the growing needs of society.

Mission of the Department:

The mission of the Department of Chemical Engineering & Technology is to educate and prepare students with critical thinking skills in the areas of chemical engineering & polymer science and engineering, for national and international positions in industry, academia and government; to develop and transmit new knowledge in these areas; to serve as a knowledge and service base to the nation; and to provide guidance and leadership in the solution of technical and socio-economic problems.

The undergraduate programme BE (Chemical Engineering) imparts high standard training, emphasizing on Chemical Engineering fundamentals - Heat Transfer, Mass Transfer, Fluid Flow, Process Control, Reaction Engineering, Computer Aided Engineering etc to groom them to carry out economic and environment friendly design, technology development and operation of a wide range of chemical plants – Industrial chemicals, petroleum, polymers, pharmaceuticals, cement, fertilizer, fuel, processed food etc. The core curriculum is complemented by electives in the important emerging areas like NanoTechnology, BioTechnology, Food Technology, Polymer Engineering, Energy Engineering etc.

In addition to the core Chemical Engineering subjects, students of BE (Chemical Engineering – Plastics and Polymers) programme are exposed to courses in Polymer Materials Technology, Polymer Processing, Polymer Product Design and Development in order to serve industries involved in polymer manufacture, polymer processing and conversion industries, polymer science research and development organizations.

The M.E.(Chemical Engineering) programme deals with topics on advanced Transport Phenomena, Reaction Engineering, Thermodynamics along with elective courses on Polymer Processing, Specialty Polymers, Nano-science and Nanotechnology, Plant Design, Surface Engineering

The M. Tech (Polymer Science and Engineering) programme aims to groom students and for advanced level research in the field of polymer science and engineering.

Food Processing Industry in India is growing at a very fast pace. Envisaging a great demand for qualified food technologists in our country, From 2014 academic year following programmes in the area of Food Technology has been introduced, with support from Ministry of Food Processing Industries: (a) 5 year Integrated M.Sc.(Food Technology) , with exit option after three years, and (b) MSc. (Food Technology). The courses include training in the area of Food Composition and Chemistry, Food Biochemistry and Human Nutrition, Food Microbiology, Food Plant sanitation, Food Analysis and Quality Control, Food Preservation and Processing Technology, Chemical Engineering unit operations in Food Processing Industries, Food Packaging, Post-Harvest Technology etc.

The Department also offers facilities for Ph. D. programme in fields of Chemical Engineering, Polymer Science and Technology, Food Technology.

Apart from standard Chemical Engineering laboratories like Fluid Flow, Heat Transfer, Mass Transfer, Reaction Engineering, Process Control etc. the Department of Chemical and Polymer Engineering has state of the art facilities for Post Graduate and Doctoral Research in Reaction Engineering, Instrumental Analysis of chemicals and Polymer, Polymer Processing, Product Development Laboratory etc. The major facilities include computer controlled reactors, Haake Minilab Micro Compounder and Haake Minilab micro injection Moulding, Air Bearing Rotational Rheometer, Malvern, HAAKE Torque Rheometer with Mixer and Extruder, Oscillating Disc Rheometer, Instron Tensile Testing machine, ATLAS accelerated weathering system, Dynamic Mechanical Thermal analyzer (TA), Gas Chromatograph. The Polymer Processing and Product development facilities include Injection Moulding machines - 80 ton L&T Ergotech and 25 ton Windsor, Extrusion Blow moulding machine with parison programming, Kolsite Single screw extruder, Kolsite Film blowing plant and PVC pipe Extrusion plant, Two roll mixing mills, Thermoforming, Compression moulding, Welding facilities – Ultrasonic and Hot air, Fused Deposition Modeling system, Stratasys, for rapid prototyping, MCP-HEK vacuum casting machine for prototyping, 3 axis CNC EDM machine etc.

The students are trained in various CAE applications ASPEN Plus, Accelerlys -Material Studio for molecular simulation, MATLAB, PROENGINEER, ANSYS, CATIA, FLUENT, POLYFLOW, MOLDFLOW etc. E-learning facility has been created with Paulsons Training Basic Injection Moulding, Simtech, Single Screw Extrusion, and Compounding with Twin Screw Extruder.

Laboratories in the area of Food Technology include Food Processing Laboratory, Food Microbiology Laboratory, Food Analysis Laboratory. The Food Processing Laboratory includes Pulper machine, vegetable dicing machine, Juice Extraction, Homogeniser, Twin Screw Extrusion cooker, Homogenizer, Colloidal Mill, Grinders, Can Body Reformer, Canning Retort, Steam generator, Steam jacketed cooker, Tray dryer, fluidized bed dryer, Vacuum bottle Filling machine, Form Fill and Seal packaging etc. Food Microbiology lab with Autoclave, Laminar flow clean air workstation, BOD incubator has the expertise of microbiological tests of water and food. The Food Analysis and quality Control facilities included Flame photometer, HPLC, Digital colorimeter, NIR Spectral Analyzer, UV-VIS Spectrophotometer etc. The other required equipment are available in Central Instrumentation Facility are also available. The facilities are being augmented with capability for determination of protein by Kjeldahl method, dietary and crude fibre determination, Fat determination, Food Texture Analysis, Atomic Absorption Spectrophotometry, Spray drying, etc.

RESEARCH AREA:

Nanoparticle synthesis, Catalysts, Advanced Polymer Composites, Alternative Energy, Pollution Control, Water Treatment Technologies, Polymer Blends and Interpenetrating Polymer Networks, Nano filtration Membrane, Recycling of Polymer Waste, Specialty Polymer, Colloids and Interfacial Science, Tissue Engineering, Sensors, Fuel Cell Membrane etc.

Department of Chemistry

The Department was established in 1955 as a support department offering various chemistry courses for the B.E. programmes and other post graduate programmes like M.Tech in Environmental Science & Engineering.

Programmes Offered	Intake
M.Sc. in Chemistry - 2 years (4 Semesters)	15
Integrated M.Sc. in Chemistry - 5 years (10 semesters) with exit option after three years	40
Ph.D. Programme	

The Department has received support under “Fund for Improvement in Science & Technology Infrastructure” (**FIST-2012**) programme of the Department of Science and Technology, New Delhi for NMR and Computational Chemistry facility. Recently we have received the Instruments as well as all the accessories and has been installed. Some specimen tests has also been successfully performed. The facility will be opened for outside and inside the institute. The Department has also received significant funds from World Bank under TEQIP-I which has helped in creating a central Instrumentation Facility with sophisticated instruments like: ICP-AES, AAS, FTIR, GC, UV-Vis, GC-MS, HPLC, HPTLC, DSC, TGA, SEM, AFM and Electrochemical Analyzer. Through the funds obtained from UGC Xlth plan the department has developed a state of art Synthesis Lab which caters to the needs of PG students & research scholars. Another research lab has also been developed through institute fund and is successfully running.

The department has quality research programs supported by UGC, SERB-DST, DBT, AICTE, CSIR etc. The faculty members are actively involved in research in the fields of pure and applied chemistry and have various publications in high-impact journals.

The Department runs a post graduate programme **M.Sc. in Chemistry** from Session 2009 and is continuing. This program designed to provide an in-depth knowledge in various aspects of Chemistry relevant to current educational and research prospects in **Organic & Medicinal Chemistry, Environmental & Inorganic Chemistry, Electrochemistry/fuel cells and energy storage device, nanomaterials, biopolymers, Computational/Theoretical and Physical Chemistry**. This curriculum expands not only the scope of traditional chemistry courses but also various interdisciplinary courses by encouraging students to apply various R&Ds, companies and other well-known institutes. The aim of this program is to prepare students for entry into Ph.D. programs, academics, industries and careers in R & D laboratories.

The Department has also started an **Integrated M.Sc. in Chemistry programme** in the year **2011**. This programme lays emphasis on mastering interdisciplinary concepts. Biology, chemistry, mathematics, physics, electronics and computers are intertwined, in lectures and in labs, to achieve a dynamic understanding of a wide range of fundamental principles within the modern scientific method. The result is a community of students trained in, and dedicated to, an interdisciplinary strategy for learning, and ultimately advancing, the many directions of science. Learning the foundations of physical, mathematical and life sciences in an integrated, active-learning classroom has the effect of producing students who are well prepared for delving into diverse areas of research. In addition to meeting disciplinary learning outcomes in biology, chemistry, mathematics, physics and computers, the students develop skills in teamwork, real problem solving, and communication.

Our department conducted workshops for the 10+2 students and teacher by Vigyan Prasar. Recently, we have opened the east zone nodal chapter for Indian Society of Chemists and Biologists (ISCB) at BIT Mesra to develop our department further organizing different national as well as international conferences, workshops and seminars. National conference on recent frontiers of chemical sciences are being planned in 2016-17. Moreover, the department purchased instruments (AUTOLAB Potentiostat/Galvanostat and Peccel Solar Simulator) under the BIT instrument budget 2014-15. Further, some other instruments such as UV-VIS Spectrophotometer, TGA, DTA and DSC, ion selective electrodes, magnetic susceptibility balance, brookefield viscometer and certain Softwares such CHEMOFFICE, ENDNOTE are being proposed to be purchased in 2016-2017. The modernization of all other labs in our department is undergoing and soon to be completed.

Department of Civil and Environmental Engineering

The Department of Civil Engineering was established at BIT Mesra in 1957. The Environmental Science and Engineering Group was established in 2002 and was merged with the Department of Civil Engineering in 2014. Henceforth the Department was renamed as Department of Civil and Environmental Engineering. **Civil Engineering**, as a subject includes a wide range of courses on various topics from those that are of general nature to those that are of utility in daily life. Starting from building of homes and other buildings, to construction of all kinds of infrastructure facilities, the scope of civil engineering is truly massive. It offers a wide reach in bright and promising career opportunities and professional advancement. **Environmental Science and Engineering** is an interdisciplinary research wing open for science and engineering degree holders. Students after completing their course in M-Tech Environmental Science and Engineering have been placed in various renowned institutions and organizations such as IISc, Bangalore, TERI, New Delhi, IITs, MECON, Sesa Goa, Lafarge, Coal India and NEERI, Nagpur.

S.No	Programmes Offered	Intakes
1	B.E. in Civil Engineering - 4 years (8 Semesters)	60
2	M.E. in Civil - 2 years (4 semesters) in two specializations a) Soil Mechanics & Foundation Engineering b) Structural Engineering	12 12
3	M.Tech. in Environmental Science & Engineering - 2 years (4 Semesters)	18
4	Ph.D. Programme	

Vision of the Department:

- To develop quality intellectuals through education, research and motivation so that they could bring a positive contribution to society in the area of civil and environmental engineering.

Mission of the Department:

- To develop professional skills through quality education and research.
- To outreach various sectors of society through interdisciplinary programmes and practical oriented approach.
- To create dynamic, logical, and effective leaders with inspiring mind sets.

The Department offers the following courses:

I. Undergraduate Programmes

The Department offers a B.E. in Civil Engineering and is one of the few in the country offering a course in Disaster Management with special focus on Earthquake Engineering at the undergraduate level.

II. Postgraduate Programmes

The Department of Civil & Environmental Engineering at BIT Mesra offers M.E./M.Tech Programmes in the following specialized disciplines:

- M.Tech. in Environmental Science & Engineering
- ME Soil Mechanics & Foundation Engineering
- ME Structural Engineering

III. PhD Programmes (Soil Mechanics and Foundation Engineering, Structural Engineering, Hydraulics and Water Resources, Transportation Engineering, Phytoremediation, Arsenic Analysis, Waste Treatment, Ecosystem Services, GIS, Pollution Modeling and various other branches of Civil Engineering and Environmental Science & Engineering).

M.Tech. in Environmental Science & Engineering

The major courses on M-Tech ESE programme are Air Pollution and Control, Water and Wastewater Treatment & Management, Remote Sensing and GIS, Ecology, Energy dynamics, Solid Waste Management, Climatology, System Engineering, ISO 14000 EMS, Industrial Pollution Control, and EIA.

Programme Educational Objective

- a) To impart students with strong knowledge base through theory courses and sessional that makes them suitable for industries, academics, research and consultancies.
- b) To develop students analytical, computational and research skills through assignments, weekly presentations and modeling software.
- c) To train the students on developing practical, efficient and cost effective solutions on problems and challenges on environmental sciences and engineering.
- d) To inculcate among students sensitivity towards social and corporate responsibilities.

Programme Outcomes

- i. To develop environmental scientists and engineers and sensitize them towards environmental issues.
- ii. To acquire analytical skills in assessing environmental impacts through a multidisciplinary approach.
- iii. To identify environmental problems and solutions through organized research.
- iv. To improve the communication and writing skill so as to face the competitive world

M.E. in Structural Engineering

Programme Educational Objective

1. To Provide the analytical expertise to create, analyse, formulate, and solve complex and challenging problems in the field of structural Engineering; and also recognize and develop the necessary and suitable tools for the same.
2. To enrich research and practices, by inspiring the leaders of tomorrow to take on the challenge with ease and confidence.
3. To Develop attitude of lifelong learning for becoming an expert in the field of structural Engineering.
4. Implant sensitivity towards ethics, public policies and their responsibilities towards the society.

Programme Outcomes

The Students will develop an ability

1. To be competent in applying systematic rigor to understanding an engineering problem, exploring its background, investigating possible solution methodologies and comparing their merits and demerits.
2. To adept at the use of the appropriate modern tools to rapidly prototype and deploy efficient solutions to real life problems. In doing so he should demonstrate sufficient knowledge of competing tools and their relative merits and demerits
3. To demonstrate the traits of learning and unlearning throughout his professional career, and be willing to learn new techniques, methods and processes.
4. To be sensitive to social, legal and ethical concerns and tune his knowledge to be a responsible engineer adhering to all established practices of his profession. She/he will display special concern for devising environment friendly solutions that shall make a positive impact on society.

ME Soil Mechanics & Foundation Engineering

Programme Educational Objective

1. To provide the technical knowledge to analyze and design foundations for any structure and also solve challenging problems in the field of soil mechanics
2. To make them understand the commitment to professional ethics
3. To develop an interest for pursuing advanced study and continuing education
4. To demonstrate a career path that shows development as a leader and makes them sensitive to their responsibilities towards the society.

Programme Outcomes

The Students will develop ability

1. To identify, formulate, and solve engineering problems and to design and conduct experiments as well as to analyze and interpret data
2. To use the techniques, skills, and modern engineering tools necessary for engineering practice
3. To design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
4. To communicate effectively

B.E in Civil Engineering Programme

Educational Objective

1. Attain the analytical expertise to create, analyze, formulate, and solve challenging problems in the field of Civil and Environmental Engineering; and also recognize and develop the necessary and suitable tools for the same.
2. Develop technical and management flair to take responsibility for engineering projects and research programs significantly.
3. Uncover multidisciplinary approach and co-relate engineering issues to social and human background in broader sense, in which their engineering helping hand will be utilized.
4. Develop attitude of lifelong learning for becoming successful Civil engineers and Environmentalists.
5. Implant sensitivity towards ethics, public policies and their responsibilities towards the society.

Programme Outcomes

1. A graduate will demonstrate a fundamental understanding of the basic sciences, mathematics and engineering concepts by applying them to engineering problems of varying degrees of complexity.
2. A graduate shall be equipped in designing efficient solutions for complex engineering problems, while complying with all established social, medical, environmental norms.
3. A graduate will be trained as a team player, well versed in understanding the dynamics of working in a team, in leading when necessary and comfortable working across the globe.
4. A graduate shall be sensitive to social, legal and ethical concerns and tune his knowledge to be a responsible engineer adhering to all established practices of his profession. She/he will display special concern for devising environment friendly solutions that shall make a positive impact on society.
5. A graduate will be articulate in his presentation, oral, written and graphical. He will convey his designs in unambiguous and clear terminology use accepted documentation tools and provide instructions which are easily interpretable.
6. A graduate will demonstrate the traits of learning and unlearning throughout his professional career, and be willing to learn new techniques, methods and processes.
7. A graduate shall determine the financial aspects of a project with sufficient reliability make effective cost estimates and convey achievable timelines for his projects.

Department of Computer Science & Engineering

The Department of CSE was established in the year 1983 and is now recognized as one of the leading departments with infrastructure and facilities to match the very best in the country. The department remains committed towards its mission which is twofold. One is to provide students with the fundamental knowledge and problem solving skills in Computer Science required for a fulfilling career. The other goal is to create and disseminate knowledge to improve Computer Science research, education and practice.

The department currently offers the following programmes, all of which are accredited by the All India Council for Technical Education (AICTE).

Programmes Offered	Intake
B.E. in Computer Science & Engineering - 4 years (8 semesters)	120
B.E. in Information Technology - 4 years (8 semesters)	60
Master of Computer Applications (MCA)- 3 years (6 semesters)	60
M.E. in Software Engineering - 2 years (4 semesters)	15
M.Tech in Computer Science & Engineering - 2 years (4 semesters)	16
M.Tech in Information Technology - 2 years (4 semesters)	18
M.Tech in Information Security - 2 years (4 semesters)	18
Ph.D. Programme	

Mission of the Department:

- To impart quality education and equip the students with strong foundation that could make them capable of handling challenges of the new century.
- To maintain state of the art research facilities and facilitate interaction with world's leading universities, industries and research organization for constant improvement in the quality of education and research.

Vision of the Department:

- The department strives to be recognized for outstanding education and research, leading to excellent professionals and innovators in the field of Computer Science and Engineering, who can positively contribute to the society.

Facilities: The department is equipped with seven laboratories with over 445 computers available for conducting laboratory sessions in diverse topics like in (i) programming languages: C, C++, Java, Oracle.(ii) Matlab for Soft Computing and Image Processing (iii) Rational Rose for Software Engineering and (iv) Laboratories for Networking, Multimedia, Simulation, Parallel Computing etc . All the Laboratories are internally networked allowing students to remotely access any particular resource at any point in time. The Department has recently installed a state of the art Fujitsu High Performance Computing System, which provides for massive computational power and the ability to host an independent cloud computing infrastructure. The installation of the system has put the Department in a very select group in the country having such a computational infrastructure.

Areas of Research: Bioinformatics, DNA Computing, Parallel Computing, Image Processing, Robotics, Intelligent Systems, Rough Sets ,DNA Nanorobotics, Software Engineering, Sensor Networks, Data Mining, Pattern Recognition, Natural Language Processing etc.

Department of Electronics & Communication Engineering

The Department of Electronics and Communication Engineering was established in the year 1960. This is one of the largest departments of the institute, having the highest number of students and the faculty members. Due to its modern infrastructure and exposure given to the students, it is one of the elite departments in India. The ECE department runs the following programmes:

Programmes Offered	Intake
B.E. in Electronics & Communication Engineering- 4 years (8 semesters)	120
M.E. in Electronics & Communication- 2 years (4 semesters) in 3 specializations	
a) Instrumentation & Control	12
b) Microwave	12
c) Wireless Communications	18
Ph.D. Programme	

Vision of the Department:

- To become a centre of excellence in teaching and research for creating technical manpower to meet the technological need of the country in the field of Electronics and Communications Engineering.

Mission of the Department:

- To facilitate state of the art education and research at undergraduate, postgraduate and doctoral levels to enable to perform challenging engineering and managerial jobs in the field of electronics and communication engineering.
- To build national capabilities in technology, education and research in emerging areas in the field of Electronics and Communication Engineering.
- To create an environment to provide excellent research and development facilities to strengthen Ph.D. programmes and research projects.
- To provide excellent technological services to bridge the gap between academics and industry in order to fulfill the overall academic needs of the society.
- To provide high quality course structure in order to turn out qualified professionals to meet the engineering needs of the country.
- To develop effective teaching skills and the research potentials of the faculty members.
- To ensure all round development of the students and to create a platform for turning out engineering professionals who can assume leadership position in society.

Bachelor in Engineering

It offers B.E. in Electronics & Communication Engineering, a 4-year (8-semester) programme with intake of 120 students. The students are exposed to all fundamental and advanced technology in the field of Electronics and Communication Engineering. Some of the courses offered are Modern Instruments and Measurements, Microprocessor and Microcontroller, Analog / Digital Communication system, Microwave Engineering, Digital Signal Processing, Intelligent Instrumentation, Computer Networking, Fiber Optics Communication System, Antennas and Propagation for Wireless Communication, Mobile and Cellular Communication, VLSI Design, Embedded system etc. The syllabi are frequently updated to incorporate recent developments. The Department has several well-equipped and advanced laboratories to help students in gaining practical exposure. Almost 100% students are absorbed by various leading industries and organizations by campus placement.

Master in Engineering

The Department is currently running three postgraduate programmes with specializations in (a) Instrumentation with intake of 12, (b) Microwave Engineering with intake of 12 and (c) Wireless Communication with intake of 18 students. A team of expert teachers are involved in teaching and providing research guidance. Students are exposed to several specialized software tools such as Cadence System Design Tools, Silvako Software (Athena & Atlas), IE3D, HFSS, ADS, CST, Microwave Office, Sonnet, Fidelity, Beampro, SystemView, LABView, MATLAB, NS-2 and QualNet etc. The department is recipient of assistance in the form of Departmental Research Support under the Special Assistance Programme of UGC. The department is running several R & D projects from various agencies like UGC, DST, AICTE, ISRO etc.

Ph.D. Programme

The Department runs PhD programme within the field of Electronics and Communications Engineering. Currently the research areas undertaken for the PhD programme are: Fibre Optic Sensors & Communication, Optoelectronic Devices, Wireless Communication, Printed RF & Microwave Circuits, Antennas for various Applications, Electromagnetics, EMI/EMC, Computational Electromagnetics, VLSI & Embedded System Design, RF MEMS, Biomedical Signal Processing, Speech & Audio Signal Processing, Image Processing, Multimedia & Automation

Department of Electrical & Electronics Engineering

The Department of Electrical Engineering was started in 1955. The B.E. curriculum was redesigned in 1986 to accommodate several Electronics and Computer subjects in order to tune its programmes according to changing requirements and since then it has been renamed as Electrical & Electronics Engineering. The Department is dedicated to the current needs of industry primarily focusing on application of new technology in various fields. As recognition of the activities of faculty members, different agencies like UGC, DST, AICTE, CDAC, TEQIP, etc have sanctioned funds to support the on-going research work.

Programmes Offered	Intake
B.E. in Electrical & Electronics Engineering - 4 years (8 semesters)	60
M.E. in Electrical Engineering - 2 years (4 semesters) in 3 specializations	
(i) Control System	12
(ii) Power System	12
(iii) Power Electronics	18
Ph.D. Programme	

Vision of the Department:

- To become, in consonance with the society, an internationally recognized center of excellence in academics, research and technological services in the area of Electrical and Electronics Engineering and related inter-disciplinary field.

Mission of the Department:

- Imparting strong fundamental concepts to students and motivate them to find innovative solutions to engineering problems independently
- Developing engineers with managerial attributes capable of applying latest technology with responsibility
- Creation of congenial atmosphere and excellent facilities for undertaking quality research by faculty and students
- To strive for more internationally recognized publication of research papers, books and to obtain patent and copyrights
- To provide excellent technological services to industry for the benefit of society

Programmes Accredited:

All the above courses are approved by AICTE. B.E. (EEE), M.E. (Control System) and M.E. (Power System) programmes are accredited by NBA. M.E.(Power Electronics) has been applied for accreditation.

Undergraduate Programme:

The emphasis is given on fundamentals of science, mathematics and their application to the solution of contemporary problems. The programme provides ample flexibility to the students to undertake various elective and breadth courses that provide exposure to various disciplines of EEE.

Electives offered:

Computer Aided Power System Analysis, Bio Electronics Instrumentation, Artificial Neural Network (ANN), Advanced Power Electronics, Robotics, High Voltage Engg., EHV Power Transmission, Artificial Intelligence, Soft Computing Techniques, Renewable Sources of Electrical Energy, Testing & Commissioning of Electrical Equipment, Embedded System & its Applications.

List of Breadth Papers:

Environment Psychology, Organisation Behaviour, Industrial Organisation & Management, Financial Management, Business Ethics, Intellectual Property Rights, Entrepreneurship & Small Business Management, etc.

Postgraduate Programmes:

M.E. in Control System:

In M.E. Control Systems Programme focuses on cutting edge control techniques like modern control system, nonlinear control analysis, discrete control techniques, optimal control, robotics, ANN based adaptive control methods, fuzzy logic controllers with advanced model reference learning and stability analysis, etc.

M. E. in Power System:

M. E. Power systems aims at imparting knowledge on advanced analysis techniques, modern tools in power system operation and control, techniques to improve the performance of EHV AC and HVDC transmission, advanced power system protection systems, planning and reliability analysis, technologies involved with renewable energy sources, DSP applications, etc.

M.E. in Power Electronics:

M.E. Power Electronics emphasizes on imparting skilled knowledge of advanced semiconductor devices, power electronic converters, their design and control methodology, dynamics of Electrical Machines, Power Electronics applications, Control of electrical drives etc.

Ph. D. Programme:

Currently a number of research scholars are working in the areas of non-stationary signal analysis, intelligent control techniques applied to Phasor Measurement Unit (PMU), Reliability analysis for power system and its components like PMU, Protection Systems, etc., Multi-Agent System (MAS) modelling, Wide Area Monitoring System (WAMS), Distribution System Planning, Automatic Generation Control and non-linear dynamic systems, Real-time Image processing for robotic application, development of new architecture for neural networks, soft computing based intelligent controller design, Fault diagnosis of 3 – ϕ Induction motor, bi-directional dc-to-dc converters, matrix converter, resonant converter, current source inverter for hybrid electric vehicles, control of induction motor drive, three-phase and multi-phase PM BLDC drive, estimation and identification of plants.

Research Activity:

The faculty members of the department (with different specializations) actively pursue research with funding from various national agencies like UGC, AICTE, DST. The current areas of research include Laboratory Prototype of Smart Grid, digital relaying of transmission using DSP techniques, reliability analysis, generation scheduling, distribution systems planning, voltage stability analysis, Fault tolerant permanent magnet drives, Energy Storage and Management, Grid Interactive Solar Photovoltaic System, Microgrid, bi-directional converters for contactless energy exchange, Image processing applied to vehicular traffic surveillance system, etc.

The research outputs are published in reputed journals like IEEE transactions, IET Proceedings, Elsevier, Taylor & Francis, Polish Academy of Science & Tech., IE (I), etc.

The department has also got two patents in the area of power systems.

Collaboration with Industries and Universities:

The department has collaborated with the Texas Instruments, NI, Research and Development Center for Iron and Steel (RDCIS), SAIL, Metallurgical Consultants Limited (MECON), Meditron (Ranchi), etc.

Conventions/Seminars/Conferences/Short-term Training Programmes:

The Department regularly organizes conventions, seminars, conferences short term training programmes/courses under aegis of AICTE- ISTE, TEQIP, UGC (FIST), NaMPET. Specialized courses for industry (SAIL, Indian Railways) have also been organized.

Keeping in view the development of nearby villages, the Department is also involved in conducting short term training programmes in electrical technical skills to youth.

Facility: The department has following well-equipped laboratories;

Basic Electrical Engineering lab., Measurement Lab., Electrical Machines lab., Power Electronics lab., Electrical Drives lab., Control Systems lab., Process Control Lab., Power Systems lab., Smart Grid lab., Digital Signal Processing lab., Simulation lab., Electrical Workshop.

The main equipment in measurement lab are - Optical transducer, thermal transducer, Kelvin double bridge, LVDT setup, strain gauge setup, setup to determine breakdown voltage of transformer oil.

Electrical Machines lab. houses all static and rotating machines like transformer, induction motor, DC motor, DC generator, synchronous generator (alternator) and motor.

The major equipment in power Electronics lab are - device characterization system, AC - DC, DC-DC, DC - AC conversion systems, Programmable signal generators, signal analyzer, etc.

The department is in the process of establishing a drive lab for enhancing research facility in the field of Power Electronics. The main equipment in Electric Drives Lab which is in the process of upgradation consist of single phase and three phase inverter, rectifier, BLDC Motor, DC Motor, three phase induction motor, etc.

The main equipment in Control laboratory include inverted pendulum, Magnetic Levitation System, Twin Rotor MIMO System, bouncing ball apparatus, coupled tank control, mechatronics kit, NI kit and a range of DSP kits. The Process Control lab consists of apparatus for control of level, pressure and flow; both manually and automatically.

The major equipment in Power Systems laboratory include generator protection scheme, static VAR compensator, network analyser, power factor controller, induction type and numerical relays, vacuum air breaker, etc. Smart grid lab is equipped with two-area system; each area is consisting of generator, transmission line and load. Control station is being developed under LabVIEW platform and SCADA software. Department is in the process of procuring PMU for the lab.

The Soft-Computing lab. (DSP lab and Simulation lab) is well-equipped with modern softwares like MATLAB and its toolboxes, LabVIEW, TMS processor kits, ETAP, PSCAD.

In Electrical Workshop, students are taught the design of domestic wiring, industrial wiring, direct-on-line starter for 3-phase induction motor, etc.

Department of Mathematics

The Department of Mathematics provides facilities for research work leading to Ph.D. degree in different areas of mathematics. Besides this, the department offers various topics in mathematics to undergraduate and post graduate students of different departments of the institute, also runs its own courses : 5 years Integrated M.Sc. (Mathematics & Computing) and 2-years M. Sc. (Mathematics) . The Department also has its own state of the art Computational Laboratory.

Programmes Offered	Intake
M.Sc. in Mathematics - 2 years (4 semesters)	15
Integrated M.Sc. in Mathematics & Computing - 5 years (10 semesters) with exit option after three years	20
Ph.D. Programme	

Mission of the Department:

- to provide an environment where students can learn and become competent users of mathematics and mathematical applications.
- to conduct research that has worldwide recognition

Vision of the Department:

- to develop and offer dynamic programs in mathematics that helps the students to enter in new emerging fields and specialisations of mathematics.
- to be among the best departments of the country

The faculties of the Department are actively engaged in research in the following areas:

- Cyber Attack, Defence and Crime
- Statistical Analysis of Hindustani Classical Music
- Differential Equations and Difference Equations
- Seismology & Earthquake Engineering
- Computational Solid Mechanics
- Operations Research, Optimisation Techniques
- Fuzzy Optimisation
- Mathematical Models on Infectious Disease, Environment Pollution
- Algorithm Analysis
- Numerical Analysis

Department of Mechanical Engineering

Since its inception in 1955, the Department of Mechanical Engineering has been known for quality teaching and research, it offers. The excellent laboratory facilities, modern computer clusters, systematically designed curriculum, and dedicated faculty members make this Department a dynamic place to study and pursue research in different areas of current interest.

Programmes Offered	Intake
B.E. in Mechanical Engineering - 4 years (8 semester)	90
M.E. in Mechanical Engineering - 2 years (4 semesters) in following specializations:	
a) Heat Power	12
b) Design of Mechanical Equipment	12
M.Tech in Energy Technology - 2 years (4 semesters)	18
Ph. D. Programmes	

The department has excellent placement record. Mechanical Engineering Graduates from BIT Mesra are sought after by many prestigious companies.

Vision of the Department:

- The Mechanical Engineering Department of Birla Institute of Technology, Mesra, Ranchi strives to be globally recognized for quality engineering education and research leading to well qualified engineers, academicians and researchers who are innovative, entrepreneurial and successful in achieving excellence in their field of study.

Mission of the Department:

- To impart quality education to the students and enhancing their knowledge and skills to be globally competitive Mechanical Engineers.
- To maintain state of the art research facilities to provide its students and faculty to create, interpret, apply and disseminate knowledge with an understanding of the limitations.
- To develop linkages and interaction with industry, R & D organisation and educational institution for excellence in consultancy practices, research and teaching.
- To provide conducive environment for learning, creativity and problem solving skill.

All degree schemes offered are modular and structured to allow a gradual development of knowledge and skill. Students undergo for industrial projects in their last semester of study. The industrial project gives students a chance to apply their engineering skill to real engineering problems. Many professional projects are industrially driven or linked, giving students direct exposure to industry as part of their studies. There is also a strong tutorial system, which provides students with a point of contact with a member of staff who can advise on welfare issues as well. Students regularly participate in various national/international events through various engineering societies like:

1. Team Srijan
2. Firebolt.

The department has Mechanical Engineering Society which takes care of all-round development of the students.

Laboratories in the department

Heat Transfer Lab., Strength of Materials Lab., CAD Lab., Hydraulics and Hydraulic Machines Lab., Theory of Machines Lab., Non-Conventional Energy Lab., Automotive Lab., Advanced Fluid Mechanics Lab., I.C. Engine/Thermal Engg. Lab., Engineering Mechanics Lab. and Computational Lab.

Research Areas: Some of the research areas are:

Composite Materials, Materials Technology, Smart Materials/Composites, Modelling and Simulation On-Condition health monitoring, Mechanical vibrations, Computational Fluid Dynamics, Heat Transfer New and Renewable Energy, Design of Thermal Systems, Computer Aided Analysis and Design Solar Energy, Waste Heat Recovery, I.C. Engines and Gas Turbines, Bio-fuels and Combustion Fluidics, Plastic Deformation and Fracture, Robotics and CAD/CAM

Department of Pharmaceutical Science & Technology

The Department of Pharmaceutical Sciences & Technology was established in 1972. It offers the following programmes:

S. No.	Programmes Offered	Intake
1	B. Pharm. - 4-years (8-semester) programme	60
2	M. Pharm. - 2-years (4-semester) programme in four specializations a. Pharmaceutics b. Pharmaceutical Chemistry c. Pharmacology d. Pharmacognosy e. Clinical Research f. Quality Assurance and Regulatory Affairs	18 18 18 18 18 18
3	M. Pharms - 2-years (4-semester) programme under QIP	08
4	Ph.D. Programmes (including 8 under QIP)	Flexible

The above programmes are recognized by the Pharmacy Council of India (PCI) and the All India Council for Technical Education (AICTE). The Department is recipient of assistance under the Special Assistance Programme (SAP) of the UGC and FIST of the DST. The Department is also recognized and approved by AICTE as one of the Centres for Quality Improvement Programmes (QIP) for postgraduate and Ph.D. programmes.

The course syllabi are updated frequently to incorporate newer developments in Pharmaceutical Sciences & Technology and also to cater the need of Pharmaceutical Industries, Academic Research and Drug Regulatory agencies. Department has facilities for doctoral research in different areas of Pharmaceutical Sciences. A number of Ph.D. degrees have been awarded besides a large number of scholars, registered for Ph.D. in different disciplines of Pharmaceutical Sciences. The Department has highly qualified and competent academic staff.

The faculties of the Department have been handling several R&D projects sponsored by National (UGC, AICTE, CSIR, DST, ICAR, TRIFED, ICMR, etc.) and International (BMBF/New Indigo/UKIERI) funding agencies.

The Department has sophisticated state of the art laboratories besides a computational & molecular modeling laboratory for teaching and research. Some important facilities and instruments available are: Differential Scanning Calorimeter (Shimadzu DSC50 & DSC60), ELISA Reader (Perkin-Elmer), Automatic Video Tracking System (Ethovision), Fluorescence Spectrophotometer (Hitachi), Gas Chromatograph (Chemito Ceres 800 Plus), Gel Electrophoresis System, High Performance Liquid Chromatography (Waters and Knauer), Preparative HPLC (Agilent), High Performance Thin Layer Chromatography with WINCAT software (Camag), High Speed Refrigerated Centrifuge, FTIR 8400S (Shimadzu), Research Microscope with photomicrography (Carl-Zeiss) & High Resolution Research Microscope with Digital Camera with PC based screen (Leica), UV-VIS Spectrophotometers 1800 and 2450 (Shimadzu & Systronics), Rotational Viscometer (Wells Brookfield Cone/Plate), Nitrogen and Hydrogen Gas Generator (Claind), Milli Q Water Purification Unit (Millipore), Non – invasive B.P. Instruments (IITC Life Sciences), Plethysmograph (IITC Life Sciences), Microwave Synthesis System (Catalyst 4RI), Lyophilizer (Operon), Rotary Evaporator (Buchi), Probe sonicator, Dissolution Apparatus, Ultracentrifuge, Texture Analyzer, Malvern Viscometer, Nano spray dryer, Humidity chamber (as per ICH), Electromagnetic sieve shaker, Ball mill, Ultra turrax digital homogenizer, etc.

An overview of different areas of research at the Department is as follows:

Pharmaceutics group

New drug delivery system: Controlled release formulations, Transdermal drug delivery systems; Development of nasal delivery system; Colon targeted drug delivery system, self-emulsifying drug delivery system. Thermodynamic approach to drug excipient interactions, Cosmeceuticals (cost-effective skin care poly-herbal formulations), Nanotechnology based formulation development, Exploration of Natural Gum as Pharmaceutical Adjuvants and Standardization of Ayurvedic Drug/Polyherbal Formulations.

Pharmaceutical Chemistry group

In-silico design, synthesis (microwave, combinatorial solution phase synthetic techniques) and evaluation of novel candidate compounds with special reference to antimicrobial, antiprotozoal, antiviral, antiHIV, anticancer, analgesic, antihistaminic, anticonvulsant, cardiovascular, antidiabetic and other activities. Isolation and characterization of natural products using spectroscopic methods (UV-VIS/IR/NMR/MS etc.) besides studies on synthetic nutraceuticals, Molecular modeling, docking, QSAR and solution phase ADME studies using CADD based software like Maestro Glide, BioSolveIT FlexX, Sybyl 7.1, and Scigress Explorer.

Pharmacognosy group

Validation of traditional systems of medicine, validated methodologies for development of new herbal formulations, microcomputerized identification of indigenous drugs & development of standards, development of drug molecules from natural sources and their enhancement by biotechnological approaches, exploring natural resources for novel drug delivery systems.

Pharmacology group

Anti tumor & immunomodulatory studies of compounds from synthetic and natural sources, general pharmacological screening of new moieties from synthetic and natural sources, toxicological studies of bioactive molecules (natural and synthetic sources), neuropharmacological studies of bioactive molecules, studies of bioactive molecules on experimentally induced urolithiasis, nephropathy, neuropathy and diabetes in animal models, biochemical and molecular pharmacological studies of bioactive molecules.

The Department maintains a well-equipped animal house, which is accredited by the Committee for the Purpose of Control and Supervision of Experiments on Animals (CPCSEA). The Department also has a Medicinal Plant Garden spread over 10 acres of land within the Institute Campus. More than 200 plants of medical and aromatic importance have been cultivated and are being maintained in the Herbal Garden. A few aromatic oils such as Citronella (Java), *Cymbopogon martinii*, *Mentha arvensis*, *Mentha piperita*, *Eucalyptus citriodora*, Lemon Grass, are extracted from time to time.

The Department also extends support to other Departments like- Bio-Engineering, Chemical Engineering & Technology, Applied Chemistry, Environmental Science & Engineering, Medical Lab Technology at the University Polytechnic, Hotel Management & Catering Technology and other engineering departments.

Department of Physics

The Department of Physics (previously known as Department of Applied Physics) since its inception in 1955 has played a pivotal role in the institute. A gamut of very motivated, well qualified and talented faculty is actively engaged in teaching as well as research in areas of theoretical and experimental physics. They have, to their credit, numerous research publications and several R&D projects. Some faculty members have been awarded international fellowships from Universities abroad and some have received BOYSCAST fellowship awarded by DST, Government of India.

Programmes Offered	Intake
Integrated M.Sc. in Physics - 5 years (10 semesters) with exit option after three years	40
M.Sc. in Physics - 2 years (4 semesters)	15
Ph.D. Programme	

Vision of the Department:

- The vision of the Department is to achieve excellence in undergraduate and postgraduate education and research for scholarly inquiry and development of new knowledge.

Mission of the Department:

- To train the students to become lifelong learners who will contribute to the creation of new knowledge, new technology, and innovation through excellence in research in emerging areas.
- To educate students to become future leaders in science, technology, industry, education and other professions and succeed in a globally competitive environment.
- To create National and International collaborations for research engagement in strategic areas of research.
- To provide beneficial service to local, state, national and international communities.

The prime objectives of the offered programmes are as follows:

- Impart high quality education in a vibrant academic ambience.
- Prepare students to take up challenges as researchers in academic and R & D organizations.
- To train students for participation in multidimensional academic activities.
- To impart scientific knowledge and inculcate human values.

The department has well equipped laboratories having several systems viz., RF magnetron sputtering, Plasma Enhanced Chemical Vapour Deposition, thermal CVD, RF/DC magnetron co-sputtering, plasma nitriding, Raman spectrometer, nanoindenter, solar simulator, D33 meter, PE loop-tracer, UV Visible Spectrometer, 10K cryostat etc.

At present the department has 13 faculty members and 15 research scholars. The department has been pursuing several sponsored projects funded by the UGC, DST, BRNS, ARDB, and NRB. In addition, recently the department has also completed two Indo-Russian, one Indo-German and an Indo-Israel projects. The Department has received "Fund for Improvement in Science & Technology Infrastructure (FIST)" from DST, New Delhi, as well as Special Assistance Programme (SAP) from UGC.

The current broad areas of research in the department include nanotechnology, condensed matter physics, quantum optics and nonlinear optics. Specific sub-areas are surface engineering with plasma coating, carbon nanotubes, diamond-like carbon (DLC) films, nano and ultrananocrystalline diamond films, solar cells, colossal magnetoresistive materials, dilute magnetic semiconductors, piezoelectric materials, electronic composite materials, magnetic composites, soliton and light propagation, optical communication, photonic crystal fibres, optoelectronics, etc.

Department of Production Engineering

Department of Production Engineering tries to provide the best quality education to its students and helps them to attain clear understanding of every aspects of today's manufacturing world so that they can meet the demands of growing manufacturing industries. The production engineering is the combination of manufacturing technology and management in planning and controlling the operations of manufacturing system. This programme aims at conveying the knowledge, judgment and skills required to design and improve manufacturing processes and high-performing sustainable production systems. The department has established the links with many industries, R&D organizations, consultancy organizations and academic institutes so as to give opportunity to the students to explore the emerging trends and technologies in the area of production engineering.

Programmes Offered	Intake
B.E. in Production Engineering - 4 Years (8 Semesters)	60
M.E. in Automated Manufacturing System - 2 Years (4 Semesters)	25
Ph.D. Programme	

The structure of courses is made keeping in mind the today's manufacturing trends. The department aims at studies as well as laboratories based on the training programmes, short term courses, workshops, collaboration and support from industry.

Vision of the Department:

- To Become a Centre of Excellence Striving Continuously towards Providing Quality Education, Research and Innovation in the Field of Production Engineering.

Mission of the Department:

- To provide quality education at both undergraduate and post graduate levels.
- To provide opportunities and facilities for research and innovation.
- To produce engineering graduates to meet the demands of manufacturing industries and R&D organizations.
- To emphasize on integrating Manufacturing technology with management.
- To impart latest technological knowledge to students by continuous development of curricula and faculty.

Bachelor in Engineering:

The Department gives the exposure to the undergraduate students to all the fundamental and advanced technology in the field of Production Engineering. Some of the papers offered in the curriculum are Metallurgy, Fluid Mechanics and Hydraulics, Mechanics of Solid, Manufacturing Processes, Design of Machine Elements, Metrology, Theory of Machine, Manufacturing Processes-II, Machine Tool Design, Statistical Quality Control, Work Study & Ergonomics, Tool Design, Material Deformation Processes, Production Planning & Control Manufacturing Automation and Robotics.

The lab courses offered by the department for the undergraduates are Manufacturing Automation & Robotics Lab, Computer Aided Design Lab, Modelling and Simulation LAB, Material Deformation Process LAB, Manufacturing Process Lab, Machine Tool Design Sessional, Work Study & Ergonomics Lab, Machine Design Sessional, Metrology Lab, Metallurgy Lab, Mechanics of Solid Lab.

Master in Engineering:

The Department runs one specialisation course in the post-graduation programme i.e. Automated Manufacturing System. In this course the papers offered are Manufacturing Automation Computer Aided Manufacturing Quality Engineering and Robust Design, Robotics & Robot Applications, Integrated Manufacturing & Resource Planning, Soft Computing in Manufacturing Automation, Planning & Control of Production System, Product Design & Manufacturing.

The various lab courses offered are Computer Aided Manufacturing Laboratory, Computer Aided Design & Drafting Laboratory, and IMS Laboratory/Coursework Manufacturing Simulation Lab. The students are even exposed to some of the specialised softwares such as CATIA, GPSS.

Ph.D. Programmes:

The department also runs the Doctoral research work in the field of production engineering field. The department has the well-equipped laboratories being supported by the central facilities of institutes and central CAD Laboratory to help the researchers to carry out the research work smoothly.

The research areas provided by the department are machining, welding, metal cutting and powder metallurgy, Non-traditional manufacturing, Metal Casting and Powder Metallurgy, Precision Forming, CAD/CAM/ FMS/ Robotics, Product Development and Rapid Prototyping, Design of Manufacturing Systems, Lean and Six Sigma, Green Manufacturing, Planning and scheduling in manufacturing environment, Supply Chain, AI application in Manufacturing Engineering, Quality Engineering and reliability, Work Design and Human Factor Engineering.

Manufacturing Automation: It is the use of control systems (such as numerical control, programmable logic control, and other industrial control systems), in concert with other applications of information technology (such as computer-aided technologies [CAD, CAM, CAX]), to control industrial machinery and processes, reducing the need for human intervention.

In the scope of industrialization, Automation is a step beyond Mechanization. Whereas Mechanization provided human operators with machinery to assist them with the muscular requirements of work, Automation greatly reduces the need for human sensory and mental requirements as well. Processes and systems can also be automated.

Soft Computing: Applications of Soft Computing have recently increased and methodological development has been strong. Soft Computing admits approximate reasoning, imprecision, uncertainty and partial truth in order to mimic aspects of the remarkable human capability of making decisions in real-life and ambiguous environments. It describes the principles and results of industrial applications of Soft Computing methods and introduces new possibilities to gain technical and economic benefits by using this methodology.

Product Design and Engineering: As a product designer engineer, you will design and develop consumer products with a focus on aesthetics, functionality and ergonomics. But your focus will stretch beyond products that look and feel good. Your understanding of the manufacturing process, materials and marketing - namely your engineering skills - is what will set you apart.

What is industrial product design and engineering?

Industrial product design and engineering focuses on hi-tech consumer product design. It integrates the creative skills of engineering (inventiveness and project management) with industrial design - namely aesthetics, manufacturing technologies and graphics.

A professional with these qualifications is often called a Product Design Engineer.

Some product designer engineers focus on the engineering aspects - such as noise and vibration control, high performance composite materials and energy use. However, others focus on their industrial design strengths to develop architectural products, control interfaces, corporate image concepts and other mass-production technologies.

Robotics: The first factor of safety issue is concerned with the support of robots. In olden days, the human workers were mostly affected by diseases, while working on hazardous workplaces. Some health hazards caused to human operators in the workplaces are toxic fumes, heat, radiation, noise, physical injury, and so on. Therefore, the introduction of robots was required in several industrial applications like spot welding, arc welding, spray coating, die casting, and more.

This paper deals with the concept of robotics like kinematics, dynamics, sensing and control of robots, and robotic programming. This gives an understanding on mechanics of industrial manipulators and offers a treatment of position analysis, dynamic analysis, static analysis, trajectory planning & control and programming concepts of manipulator along with industrial and non-industrial applications.

IMRP: Manufacturing and engineering depend heavily on computers for many low-level operations, including design, resource planning and production scheduling. But only a few companies have implemented the sort of enterprise-wide computerized planning/project management found in other industries. However, substantial gains in productivity, flexibility, and production costs are to be made from integrating all aspects of the planning and scheduling process. Examines the need for integrated,

company-wide planning in manufacturing/engineering companies, and highlights how it is increasingly being applied to the different parts of the production cycle. It also deals with advanced manufacturing techniques like flexible manufacturing system (FMS), computer integrated manufacturing (CIM), and also with material handling system like robots & AGVs.

Quality: To know more about the quality tools and functions which are used in any of the industry to inspect a lot and scrutinize them on the basis of their quality characteristics. Besides this we came to know about various problem-solving techniques like Pareto analysis, Ishikawa diagram, Interrelationship diagram, etc.

Computer Aided Manufacturing (CAM): This subject basically deals with various programming languages and computer applications in manufacturing or production engineering (CNC, DNC, etc.) for minimizing the production time and cost of the product. Also deals with modern manufacturing tools like Additive Manufacturing, Green Manufacturing, and the application of computer in Inspections.

Production Planning and Control (PPC): Production planning and control system in an industry invariably solves the following purposes:

1. Minimizes the mismatch between demand and supply.
2. Maximize the capacity and utilization of facilities.
3. Minimizes the work in process inventory (WIP).
4. Maximizes productivity and flexibility of product range.

Ecology: This subject deals with the effect of industrialization on our environment, surroundings, and also affecting the flora and fauna around our ecosystem. Also deals about the various conventional and non-conventional sources of energy.

Industrial Pollution Control (IPC): This subject deals with the following course objectives:

1. Identify sources, types, and control equipment for different types of industrial pollution.
2. Identify sources of water pollution, general water treatment, and waste water treatment.
3. Understand reasons of land degradation and soil quality loss.
4. Classify various health problems emerging off industrial activities.
5. To develop an understanding on occupational health and safety measures.

Computer Aided Design Lab: The CAD Laboratory has around 30 computers (desktops and workstations) with the latest configurations connected with a high-end server through switched networking. This Lab gives students an exposure to 2D & 3D Modelling concepts, Part Assemblies, Simulations using softwares like Auto CAD, CATIA & PRO-E.

Softwares like GPSS (General Purpose Simulation Software) are also used by the students to simulate the real time situations in facilities to optimize the resources available and to find their overall Utilization.

Computer Aided Manufacturing Lab: This laboratory has number of sophisticated equipments, which not only being utilized for the training of students but also utilized for the Research work of the department and giving support to the other research work going in the institute. These facilities are also being utilized for supporting the medium and small scale industries situated in and around Ranchi.

Major Equipments available are:

1. Flexible Manufacturing Systems & Robotics

FMS is an integrated, computer controlled, automated manufacturing system covering material handling system, CNC machine tools, inspection, storage and retrieval system that can simultaneously process medium-sized volumes of a variety of parts.

The FMS lab provides excellent facility, equipment, and information systems for hardware-based experiments, computer-based modeling, simulation and analysis and education.

2. PLCs and Sensors

PLC (Programmable Logic Controller) is a device used to control various Hydraulic and Pneumatic actuators used in various automated manufacturing systems such as Robots, CNCs, etc.

Various types of Tactile and Non Tactile Sensors are studied along with their applications in automated machines and robots.

3. CNC Machines

Various types of CNC machines like CNC Lathe, CNC Milling, and CNC Drilling are studied by students and different types of jobs are prepared to visualize their workings.

Department of Remote Sensing

Department of Remote Sensing was established in 1997 with an aim to meet the increasing demand for qualified manpower in this rapidly developing field. Application of Remote Sensing/Geoinformatics techniques using tools such as Geographic Information System (GIS) and Global Positioning System (GPS) in various activities including resources evaluation, environmental monitoring and land use/land cover mapping, urban planning, etc. has grown considerably during the last few decades. RS data products are increasingly being used for plan formulation at all levels. An essential pre-requisite to partaking in these opportunities is the building of various indigenous capacities for the development and utilization of space science and technology. This has led to a spurt in the demand for qualified manpower in this field.

Programmes Offered	Intake
M.Tech in Remote Sensing -2 years (4 semesters)	18
M.Sc. in Geoinformatics -2 years (4 semesters)	20
Ph.D. in all branches of Remote Sensing, GIS, Earth Sciences	

Vision of the Department:

Be a centre of excellence in the field of Remote Sensing and Geoinformatics Technology education and research to match the needs of ever increasing requirement of human resources in these fields and to cater to the larger interest of the Society and Nation.

Mission of the Department:

- Impart quality education and equip the students with strong foundation that could make them capable of handling challenges of the ever advancing technologies.
- Maintain state-of-the-art in research facilities and integrity with the world's leading universities and research organisations for constant improvement in the quality of education and research.

Department of Remote Sensing is a DST- FIST sponsored department and as also UGC-SAP supported. The department is associated with many National and International agencies for R&D projects and consultancy works. This department has been recognized and awarded several projects from Govt. of India and Govt. of Jharkhand.

Significance of Remote Sensing

The world is being scanned constantly by highly sophisticated Earth Resources Satellites like IRS, CARTOSAT (India), LANDSAT (USA), SPOT (France), ERS (ESA), RADARSAT (Canada), IKONOS and Quickbird etc. Availability of repetitive remote sensing (RS) data in digital and pictorial forms has increased the scope of identifying, mapping, monitoring, classifying and evaluating different forms of renewable and non-renewable earth resources using multi-spectral, multi scanner and multi-temporal RS data products. The benefits of space technology, both direct and indirect, have introduced new dimensions into the study and understanding of Earth's processes and in improving the quality of life for the people living on it.

Department is participating in EDUSAT Programme of Indian Institute of Remote Sensing (IIRS), Department of Space (DoS), Dehradun for imparting "Distance Learning Course on RS, GIS, and, GPS and DIP".

LABORATORIES IN THE DEPARTMENT

The department has set up several labs listed below for hands-on training to its postgraduate students such as for Digital Image Processing (DIP), GIS, GPS, Photogrammetry, Digital Photogrammetry, Cartography and Image Interpretation.

1. Geographic Information System (GIS) Lab
2. Digital Image Processing (DIP) Lab
3. Digital Photogrammetry Lab
4. Cartography & Image Interpretation Lab
5. GPS & Satellite Navigation Lab
6. Project Lab
7. Map Production & Reprographic Lab

These labs are equipped with latest new generation computer systems, workstations, server along with software for GIS, Cartography, and DIP such as ArcGis, ERDAS Imagine, ERDAS Virtual GIS, LEICA Photogrammetry Suite, ENVI, Definines, Insar Earth View, River Tool, PCI Geomatica, Image Analyst, Modular GIS Environment (MEG), IIRAS, Geomedia Professional, Geomedia Intersite Interplot Professional. The department labs are also equipped with instruments like DGPS, handheld GPS, large format scanner, flatbed scanner, map plotter, printer, Procom-2 Optical Pantograph, Mirror Stereoscopes, Ground Truth Radiometer (GTR) etc.

Programme Educational Objectives

- To prepare the students in identifying, analysing and solving geospatial problems.
- To train the students in developing practical and executable solutions to the challenges of growing field of Remote Sensing and GIS.
- To impart the students with strong base of knowledge that makes them suitable both for industries as well as for teaching and research.
- To inculcate the students with the sensitivity towards ethics, public policies and their responsibilities towards the Society.

Department of Space Engineering and Rocketry

The Department of Space Engineering and Rocketry – the first of its kind in the country was established in 1964 to train scientists and engineers in the important areas of Aerospace Engineering and Rocket Technologies. Since 1968 it has been offering a post-graduate degree course leading to M.E. in Space Engineering and Rocketry with in-depth specialization in two specific areas- namely Aerodynamics and Rocket Propulsion. The Department aims to provide state of art education and training to its students to enable them to contribute efficiently in the National efforts being made in the fields of Space & Defence related technologies and challenging future missions.

Programmes Offered	Intake
M.E. in Space Engineering & Rocketry - 2 years (4 Semesters) programme in two specializations	
a) Aerodynamics	12
b) Rocket Propulsion	12
Ph.D. Programme	

The Department also provides research facilities at doctoral and postdoctoral levels in the fields of Aerodynamics and Flow Studies, Propellant Technology, Rocket Propulsion, Combustion.

The Rocket Propulsion Laboratory has static test set-ups equipped with a computer controlled firing facility and PC based data acquisition and analysis system for solid, liquid and hybrid rocket motors. Basic infrastructure for design and fabrication of rocket motors is also available in the Department.

In the area of Propellant Technology, complete processing and characterization facilities are available for rocket propellants and igniters. Advanced techniques and equipments for carrying out research in the areas of high-energy material, igniters, inhibitors and insulators, and high performance metalized gelled propellants are also available in the Department.

Modern equipments like STA, TGA, DSC, Viscometers, Rheometers, Calorimeters Spectrophotometers Flame Propagation and Stability Unit etc. are available for training and research.

In the Aerodynamics Laboratory, 4 wind tunnels are available to train students and carry out research work in the fields of High speed / Low speed Aerodynamics, and unsteady Aerodynamics. Different types of pressure sensors and flow visualization techniques are available to study the flow field on scaled models of aerospace vehicles. Commercial software ANSYS to carry out CFD related activities is available with highend research licenses. In-house CFD code developmental activities are also undertaken and is the current research interest of the group.

Sec 8. Discipline, Rules & Regulations, Hostel and Medical Examination

Institute Rules & Regulations: For details of Institute rules and regulations, please see booklet provided at the time of admission.

Discipline

The Institute places a very high emphasis on discipline of students both inside and outside the campus. Students must abide by the Institute and Hostel rules and agree to conform to the rules and regulations enforced from time to time. They must not do anything either inside or outside the Institute that will interfere with its orderly governance, discipline and image. Students must attend lectures, tutorials and practical classes regularly. A minimum attendance of 75% in lectures, tutorials and sessionals for each subject is essential for appearing in the Semester Examinations. Thus, students should attend all theory and laboratory classes from the first day of the academic year. In case of absence due to unavoidable circumstances, students are advised to take prior permission from the Dean / Head. In case of absence due to illness, students will have to produce a Medical Certificate with an application from their parents or guardians. In such a case, parents/guardians or Hostel Warden should inform the authorities immediately. Students should strike a proper balance between extracurricular activities and academic requirements. A student's participation in extracurricular activities should not be allowed to interfere in his/her academic schedule.

During teaching hours, the main lobby, the library, the corridors of the Institute and the area surrounding the Institute are to be observed as silence zones. Students must not cause any disturbance in these zones. Students must not indulge in any kind of misconduct or indiscipline or anti-social activities within or outside the campus. Students must not form a group causing any hindrance to the academic and administrative activities of the College. Those found doing so will be punished and strict disciplinary action will be taken by the authorities. Students shall not damage the property of the Institute. Cost of such damage will be recovered from students, parents/guardians of the students.

Students must always carry their Identity Card and produce it on request. In case of loss or damage of Identity Card, the concerned authorities should be informed immediately.

Students are not permitted to enter and use the laboratory / workshop / sports ground if they do not wear appropriate dress. For example, they should enter the laboratory only with apron, cap or mask as instructed. Students should park their cycles in an orderly manner at the cycle stands. Students should follow the rules of the Hostel Mess / Canteen. Students are advised to read the Notice Boards regularly.

Students are strictly prohibited from possessing or consuming spirits, tobacco products and narcotic drugs either within or outside the campus, and if found violating this will be rusticated immediately, without warning.

Ragging in any form inside or outside the campus is strictly prohibited by law. Any students found ragging other students will be summarily expelled from the Institute and dealt with as per the directive of Hon. Supreme Court/Hon. High Court.

Each student must read the “UGC Regulations on Curbing the Menace of Ragging in Higher Educational Institutions, 2009” on the UGC website. Each student admitted to any of the Institute’s programmes must submit the two completed affidavits [one from candidate and one from parents] at the time of admission. [for details please see Sec-10 of this Information Brochure].

Hostel

Hostel facilities are provided only at Mesra & Patna Centres. All students admitted at Mesra and Patna Centres are required to reside in one of the Institute hostels, to which they are allotted and must take food along with other inmates of the hostel in the common mess. There are separate hostels for girls students.

Medical

All selected students will be required to undergo medical examination by a Medical Officer of the Institute and their admission is subject to being found medically fit for the Programme. Therefore, candidates, for their own satisfaction, are advised to get themselves examined by a registered medical practitioner.

The Institute at Mesra is located in a spacious green campus. There are small forests with a large number of trees – mostly sal trees which are native to Chotanagpur. These sal trees and a number of other trees and plants have their flowering season during mid-February to early April, and this sometimes leads to a large pollen content in the air. It has been noted that some people who are allergic or susceptible to pollen from these sal trees / other plants may develop some health problems / breathing problems or their existing problems may be aggravated during these weeks, as also during some other months of the year when other plants flower. Thus, such candidates who are known to be sensitive or susceptible to pollen from trees or other plants are required to get allergy tests done / take advice from their physicians / a specialist before taking admission at Birla Institute of Technology, Mesra, Ranchi.

Applicability of Regulations for the time being in force, Disclaimer and Legal Jurisdiction:

In Force

Notwithstanding the nature of a programme spread over more than one academic year, the regulations in force at the time a student joins a programme shall hold good only for the examinations held during or at the end of the semester. Nothing in these regulations shall be deemed to debar the Institute from amending the regulations subsequently and the amended regulations, if any, shall apply to all students old or new, as specified therein.

Disclaimer

The statements made in this Information Brochure and all other information, contained herein are believed to be correct at the time of publication. However, the Institute reserves the right to make at any or without notice, changes in and additions to the regulations, conditions governing the conduct of students, requirements for degree, fees and any other information, or statements contained in this Information Brochure. No responsibility will be accepted by the Institute for hardship or expense encountered by its students or any other person for such changes, additions, omissions or errors, no matter how they are caused.

Legal Jurisdiction

All disputes will be subject to jurisdiction of the Civil Courts at Ranchi city only.

Sec 9. Undertaking for candidates appearing for final examinations in 2016

Format of Undertaking to be typed and submitted on Non- Judicial stamp Paper, signed by Public Notary, at the time of admission, by those candidates who are provisionally selected for the Postgraduate Programmes of the Institute, and who are appearing for their final examinations in 2016.

Please fill in all blanks, select relevant items, and delete whatever is not applicable.

1. I, _____ son/daughter of _____ resident of _____ P.S. _____ Dist. _____ hereby declare that I am fully aware that minimum marks for admission to the M.E. / M.Tech / M.Pharm / MUP / M.Sc. Programme in _____ of the Birla Institute of Technology is _____ % (_____ % for SC/ST) in Honours / aggregate of all subjects in all years in graduate/postgraduate level (qualifying examination) and therefore I shall be disqualified for admission to the above Programme of Birla Institute of Technology, if I do not secure minimum _____ % (_____ % for SC/ST) in Honours / aggregate of all subjects in all years in graduate / postgraduate level or equivalent eligibility qualification (qualifying examination).
2. I belong to SC / ST / OBC / General category (strike out whichever is not applicable)
3. I do hereby undertake that since I have been provisionally allowed to appear in the selection procedure to above Postgraduate Programme although results of my graduate / postgraduate /equivalent eligibility qualifying examination has not yet been published, I shall not insist on extension / conversion of the provisional admission, if
 - i). I fail to secure minimum _____ % (_____ % for SC/ST) in Honours / aggregate in all subjects in all the years in such graduation/postgraduation or equivalent eligibility qualifying examination, or
 - ii). I fail to produce the official result by the 31st October 2016.
4. I undertake that all the certificates / documents submitted by me are authentic and are issued by competent authority.
5. I undertake that if at any time during the programme I am found not to be eligible for admission for not having required marks in graduation / postgraduation, my admission shall be cancelled.

Counter Signed

(Guardian)
Name & Address in Block Capitals
Name _____
Address _____

(Applicant)
Name & Address in Block Capitals
Name _____
Address _____

Sec 10. Anti-ragging Affidavit

How can fill Online affidavits and Why?

1. It is mandatory for every student and his/her parents to submit an anti-ragging affidavit at the time of admission. These are UGC's regulations.
2. It is the order of the Hon. Supreme Court that contact details of students must be collected from these affidavits and stored electronically at a central location.

It is a simple procedure comprising 3 steps

Step 1: Log on to

www.ANTIRAGGING.in

or

www.AMANMOVEMENT.org

Click on the button called 'On line affidavits'

Step 2: Fill in the information as desired and submit the form.

Step 3: On successful completion you will receive affidavits, both for Students and Parents, through E-mail.

Note:

- **If you do not have an E-mail address please create one before you fill an affidavit forms.**
- If your mother or father or guardian does not have a phone or a mobile phone or email then please give the numbers / email of their friends or relations or neighbors.
- If you do not have a mobile number, then please give the mobile number of your friend in the Institute.

After filling this form successfully you will receive the Student's Anti Ragging Affidavit and the Parents Anti Ragging Affidavit in your Email. Please print both the Affidavits, sign them yourself, request your parents to read the details and request them to sign their affidavit and then submit both during admission.