JAM 2007

JOINT ADMISSION TEST TO M.Sc.

FOR ADMISSION TO M.Sc. and OTHER POST-B.Sc. PROGRAMMES

at

INDIAN INSTITUTES OF TECHNOLOGY

BOMBAY, DELHI, GUWAHATI, KANPUR, KHARAGPUR, MADRAS, ROORKEE

INFORMATION BROCHURE

Organizing Institute

INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI

Guwahati – 781 039

C O N T E N T S

1. INTRODUCTION

The Indian Institutes of Technology (IITs) are Institutions of national importance established through an Act of Parliament. The IITs are well known the world over for quality education in engineering and science, and research in frontier areas. The IITs aim to:

- build sound foundation of knowledge,
- pursue excellence,
- enhance creativity,

  in intellectually stimulating environment.

The Master of Science and other post-B.Sc. programmes at the IITs offer high quality post graduate education in respective disciplines, comparable to the best in the world. The current pace of advancement of technology needs a coherent back up of basic science education and research. The vibrant academic ambience and research infrastructure of the IITs motivate the students to pursue R&D careers in frontier areas of basic sciences as well as interdisciplinary areas of science and technology.

From the Academic Session 2004-2005, Indian Institutes of Technology have started conducting a **Joint Admission test to M.Sc. (JAM)** for admission to M.Sc. and other post-B.Sc. programmes at the IITs. The main objective of JAM is to revive and consolidate 'Science' as a career option for bright students from across the country and provide them a single step opportunity for admission to some of the postgraduate programmes offered at the IITs. In due course, JAM is also expected to become a benchmark for normalizing undergraduate level science education in the country.

IITs have well equipped modern laboratories, efficient computer networks and state of the art libraries. The curricula for M.Sc. and other post-B.Sc. programmes are designed to provide the students opportunities to develop academic talent leading to challenging and rewarding professional life. The curricula are regularly updated at each IIT. Interdisciplinary content of the curricula equips the students to utilize scientific knowledge for practical applications. The teaching process is structured to promote close and continuous contact between the faculty and the students.

Credit based academic structure of the IITs allows students the flexibility to pursue the programme at their own pace, though a minimum level of performance is expected of all students. The medium of instruction in all the programmes is English. A number of financial assistantships and freeships are available to SC/ST and other deserving and meritorious students at individual Institutes.

2. GENERAL INFORMATION

(a) The JAM 2007 is open to all nationals. The Indian and foreign nationals seeking admission to academic programmes covered under JAM 2007 need to appear in JAM 2007. There is no age restriction.

(b) Foreign nationals will be required to satisfy the prevailing rules on the admission for foreign students of the admitting institute(s). For further details, they are advised to contact the concerned admitting institute(s).

(c) To apply for admission to a desired programme, a candidate is required to qualify in the corresponding Test Paper and also satisfy the minimum educational qualifications and eligibility criteria of the admitting Institute.

(d) The candidates who have either appeared or are due to appear in the final examination of their qualifying degree in 2007 are also eligible to appear in

the Test and on qualifying JAM 2007, can apply for provisional admission on the basis of their results up to pre-final year/semester subject to the condition that: (i) All parts of their final examination shall be over by the date of registration, and (ii) They shall produce the proof of having passed the qualifying degree with required eligibility as specified by the admitting Institute in the form of the final result on or before **September 30, 2007**.

(e) Admissions to various academic programmes at different Institutes will be made on the basis of merit in JAM 2007. For each Test Paper, separate merit lists will be prepared for General, SC, ST and Person with Disability (PD) category candidates, on the basis of performance in the Test.

(f) Request with proper documentation for change of category will be considered only upto **February 16, 2007.** Requests received after this date will not be accepted under any circumstances.

(g) **Candidates should note that mere appearance in JAM 2007 or being in the merit list of any Test Paper neither provides any guarantee nor any automatic entitlement for admission.** Qualified candidates shall have to apply for admission as per the prescribed procedure and admissions shall be made in order of merit.

(h) The admitting Institute has the right to cancel, at any stage, the admission of a candidate who is found admitted to a course to which he/she is not entitled, being unqualified or ineligible in accordance with the ordinances and regulations in force.

(i) Use of unfair means by a candidate at JAM 2007 whether detected at the time of Test, evaluation or at any other stage will lead to cancellation of his/her candidature and also debar him/her from appearing in JAM in future.

(j) Disclosure of identity in any form e.g. writing roll number or name inside the question-cum-answer book, making any kind of distinguishing marks, etc. may lead to disqualification of the candidate.

(k) The Institutes reserve the right to change the statutes and regulations of JAM 2007 and the admission procedure without any prior notice.

(l) With regard to the interpretation of the provisions of any matter not covered in this Information Brochure, the decision of the Organising Institute shall be final and binding on all the parties.

3. ACADEMIC PROGRAMMES

The following are the full-time M.Sc. and other post-B.Sc. programmes at different IITs, the admissions to which shall be made on the basis of JAM 2007.

IIT Bombay: Two-year Master of Science (M.Sc.) programmes in Applied Statistics and Informatics, Biotechnology, Chemistry, Applied Geology, Applied Geophysics, Mathematics, Physics and M.Sc.–Ph. D. Dual Degree programme in Physics.

IIT Delhi: Two-year Master of Science (M.Sc.) programmes in Chemistry, Mathematics and Physics.

IIT Guwahati: Two-year Master of Science (M.Sc.) programmes in Chemistry, Mathematics and Computing, and Physics.

IIT Kanpur: Two-year Master of Science (M.Sc.) programmes in Chemistry, Mathematics, Physics, Statistics and M.Sc.-Ph.D. Dual Degree programme in Physics. (Transfer from M.Sc.-Ph.D. Dual Degree programme to M.Sc. Physics programme is not permitted).

IIT Kharagpur: Two-year Master of Science (M.Sc.) programmes in Chemistry, Geological Sciences, Geophysics, Mathematics, Physics and Statistics &

Informatics.

IIT Madras: Two-year Master of Science (M.Sc.) programmes in Chemistry, Mathematics and Physics.

IIT Roorkee: Two-year Master of Science (M.Sc.) programmes in Biotechnology, Chemistry, Applied Geology, Applied Mathematics, Industrial Mathematics and Informatics, and Physics. Three-year Master of Technology (M.Tech.) programme in Applied Geophysics and Three-year Interdisciplinary Master of Computer Applications (MCA) programme.

The academic programmes, their durations and number of seats available in different Institutes with programme codes are listed in Table-1.

Table-1

Academic Programmes, Their Durations and Number of Seats* Available at Different Institutes with Programme Codes (in parentheses) for JAM 2007

Sl. No.	Name of the Academic Programme	Duration (Semester)	Number of Seats Available at Different IITs						
			IIT Bombay	IIT Delhi	IIT Guwahati	IIT Kanpur	IIT Kharagpur	IIT Madras	IIT Roorkee
1.	M.Sc. Biotechnology	4	17 (11)	-	-	-	-	-	24 (71)
2.	M.Sc. Chemistry	4	25 (12)	35 (21)	30 (31)	27 (41)	30 (51)	35 (61)	16 (72)
3.	M.Sc. Applied Geology	4	18 (13)	-	-	-	-	-	10 (73)
4.	M.Sc. Applied Geophysics	4	15 (14)	-	-	-	-	-	-
5.	M.Sc. Geological Sciences	4	-	-	-	-	20 (52)	-	-
6.	M.Sc. Geophysics	4	-	-	-	-	15 (53)	-	-
7.	M.Sc. Mathematics	4	18 (15)	35 (22)	-	26 (42)	20 (54)	35 (62)	-
8.	M.Sc. Mathematics and Computing	4	-	-	30 (32)	-	-	-	-
9.	M.Sc. Applied Mathematics	4	-	-	-	-	-	-	10 (74)
10.	M.Sc. Industrial Mathematics and Informatics	4	-	-	-	-	-	-	10 (75)
11.	M.Sc. Physics	4	25 (16)	35 (23)	30 (33)	19 (43)	30 (55)	35 (63)	16 (76)
12.	M.Sc.- Ph.D. Dual Degree Programme in Physics	-	8 (17)	-	-	9 (44)	-	-	-
13.	M.Sc. Statistics	4	-	-	-	26 (45)	-	-	-

14.	M.Sc. Applied Statistics and Informatics	4	25 (18)	-	-	-	-	-	-
15.	M.Sc. Statistics and Informatics	4	-	-	-	-	15 (56)	-	-
16.	Master of Computer Applications	6	-	-	-	-	-	-	30 (77)
17.	M.Tech. Applied Geophysics	6	-	-	-	-	-	-	10 (78)

*number of seats may vary at the time of admission.

4. MINIMUM EDUCATIONAL QUALIFICATIONS FOR ADMISSION

M.Sc. Biotechnology

IITB, IITR: Bachelor's degree in any branch of Science/ Agriculture/ Pharmacy/ Veterinary/ Engineering/ Medicine (MBBS).

M.Sc. Chemistry

IITB, IITD, IITG, IITK, IITKgp, IITM, IITR: Bachelor's degree with Chemistry as a subject for three years/ six semesters and Mathematics at (10+2) level.

M.Sc. Applied Geology/ M.Sc. Geological Sciences

IITB, IITKgp, IITR: Bachelor's degree with Geology as a subject for three years/ six semesters and any two of Mathematics, Physics, Chemistry and Biological Science as subjects. The candidate must have Mathematics at (10+2) level.

M.Sc. Geophysics

IITKgp: Bachelor's degree with any two of Physics, Mathematics and Geology for at least two years/ four semesters and the third one for at least one year/ two semesters.

M.Sc. Applied Geophysics/ M.Tech. Applied Geophysics

IITB, IITR: Bachelors degree with Mathematics and Physics as subjects and any one of the following subjects: Chemistry, Geology, Statistics, Electronics, and Computer Science.

M.Sc. Mathematics/ M.Sc. Mathematics and Computing/ M.Sc. Applied Mathematics/ M.Sc. Industrial Mathematics and Informatics

IITB, IITD, IITG, IITK, IITKgp, IITM, IITR: Bachelor's degree with Mathematics as a subject for at least two years/four semesters.

M.Sc. Physics/ M.Sc.-Ph.D. Dual Degree Programme in Physics

IITB, IITG, IITK, IITKgp, IITM, IITR: Bachelor's degree with Physics as a subject for at least two years/ four semesters and Mathematics for at least one year/ two semesters.

IIT Delhi: Bachelor's degree with Physics as a subject for three years/ six semesters and Mathematics for at least one year/ two semesters.

M.Sc. Statistics/ M.Sc. Applied Statistics and Informatics/M.Sc. Statistics and Informatics

IITB, IITK, IITKgp: Bachelor's degree with either Mathematics or Statistics as a subject for at least two years/ four semesters.

Master of Computer Applications (MCA)

IITR: Bachelor's degree with Mathematics as a subject for at least one year for annual system candidates/ at least two papers of Mathematics for semester system candidates.

5. ELIGIBILITY REQUIREMENTS FOR ADMISSION

JAM 2007 qualified candidates shall have to fulfill the following eligibility criteria for admissions in IITs.

- At least **55% aggregate** marks (for all subjects, all years combined) for General category candidates and at least **50% aggregate** marks (for all subjects, all years combined) for SC/ST category candidates in the qualifying degree.

For candidates with letter grades/CGPA (instead of percentage of marks) the equivalence in percentage of marks will be decided by the admitting institute(s).

6. TEST PAPERS FOR ACADEMIC PROGRAMMES

Admissions to different academic programmes shall be made on the basis of merit in the corresponding Test Papers of JAM 2007. The names of the Test Papers with their codes and the corresponding academic programmes for admission are given in Table-2.

Table -2
Test Papers with Codes and the Corresponding Academic Programmes for Admission (JAM 2007)

S.No.	Test Paper	Test Paper Code	Academic Programme(s) for Admission
1	Biotechnology	BT	M.Sc. Biotechnology
2	Chemistry	CH	M.Sc. Chemistry
3	Computer Applications	CA	Master of Computer Applications
4	Geology	GG	M.Sc. Applied Geology M.Sc. Geological Sciences
5	Geophysics	GP	M.Sc. Applied Geophysics M.Sc. Geophysics M.Tech. Applied Geophysics
6	Mathematical Statistics	MS	M.Sc. Statistics M.Sc. Applied Statistics and Informatics M.Sc. Statistics and Informatics
7	Mathematics	MA	M.Sc. Mathematics M.Sc. Mathematics and Computing M.Sc. Applied Mathematics M.Sc. Industrial Mathematics and Informatics
8	Physics	PH	M.Sc. Physics M.Sc.-Ph.D. Dual Degree programme in Physics

7. TEST SCHEDULE

The schedule for different Test Papers of JAM 2007 is given in Table-3. Each Test paper will be of **three hours** duration.

Table-3

JAM 2007: Test Schedule

Date	Time	Test Paper(s)
March 25, 2007 Sunday	9:00 am –12:00 noon	Chemistry / Computer Applications/ Geology/ Mathematical Statistics/ Physics
	2:00 pm – 5:00 pm	Biotechnology/ Geophysics / Mathematics

The Test schedule will remain unchanged under any circumstances.

7.1. Number of Test Papers Allowed and Additional Fee: The maximum number of Test Papers in which a candidate can appear shall be **Two**, subject to the restrictions imposed by the Test Schedule (Table-3) and on payment of requisite additional fee. If a candidate is appearing in **Two** Test Papers, the candidate is required to submit a Demand Draft for the amount Rs.200/- (Rs.100/- for SC/ST candidates) drawn in favour of "**Chairman, JAM, IIT Guwahati**", payable at Guwahati along with the Application Form as an additional fee for second test paper.
The candidates must check from the Test Schedule (Table-3), that there is no clash of time schedule for the two Test Papers in which they wish to appear. If such a clash is found in the JAM application of a candidate, one of the test papers shall be cancelled and no refund of the additional test paper fee shall be made.

8. PATTERN OF TEST PAPERS

Test Papers for Biotechnology and Computer Applications will be fully Objective Type with multiple choice questions only. These Objective Test Papers shall have to be answered in an Objective Response Sheet (ORS), which will be evaluated by electronic means. Invalidation of answers arising from incomplete or incorrect filling of bubbles on the ORS will be the sole responsibility of the candidates. Therefore, it is imperative that the instructions given on the ORS are carefully read and followed by the candidates.
Test Papers for Chemistry, Geology, Geophysics, Mathematical Statistics, Mathematics and Physics will be Objective-cum-Subjective Type. Each of these Test Papers shall contain 30% Objective type questions and the remaining as Subjective type questions. There will be a question-cum-answer book for each of these six Test Papers. Answers to the Objective questions are to be marked in the appropriate box against each question number in the `Answer Table' following the Section on Objective type questions, in the question-cum-answer book itself. Answers to the Subjective type questions are to be given only in the space provided after each question. No supplementary sheet will be provided.
The Objective type questions in all the Test Papers will have four choices given as possible answers, of which, only **one** will be correct. There will be **negative** marking for wrong answers to the **Objective type questions** in **all the Test Papers** with negative weightage of 1/3 (one third) of the marks assigned to correct answer.
NOTE:

(a) **Use of logarithmic tables, calculator of any kind, cellular phone/ pager/electronic gadgets is NOT permitted during the Test.** Further, the candidates are not allowed to keep calculators, cellular phones, pagers or electronic gadgets **inside the examination hall**.

(b) All answers to the subjective type questions must be written in blue/ black/blue-black ink only. Sketch pen, pencil or ink of any other colour should not be used.

(c) The medium for all the Test Papers will be English only.

9. CITIES/TOWNS OF JAM TEST CENTRES

The cities/towns where JAM Test Centres shall be located are listed in **Appendix-I**. If sufficient number of candidates is not available at a listed city/town, then the centres in that city/town may be dropped, and the name of that city/town may not appear in the list of the centres.

Candidates shall have to indicate two choices of cities/towns in terms of their codes for the centres where they wish to appear in JAM 2007. As far as possible, candidates will be allotted centres in the cities/towns of their first choice. A centre once allotted will not be changed normally.

A request for a change of a centre within the same city/town will **not** be permitted. However, under exceptional circumstances, a change of centre (to another city/town) may be permitted if request with valid reason for the same is received in the office of the Organizing Chairman, IIT Guwahati, Guwahati on or before **February 26, 2007** alongwith a Demand Draft of Rs. 250/- (Rs. 125/- for SC/ST candidates) drawn in favour of **'Chairman, JAM, IIT Guwahati'** payable at Guwahati. The decision of the Organizing Chairman, JAM 2007, in this regard will be final.

10. RESERVED SEATS

A certain number of seats are reserved in all the Institutes for the candidates belonging to various categories. The number of the seats reserved (in percentage) under different categories at present, in every programme, are as given in Table-4.

Table-4: Reserved Seats

Sl.No.	Category	Seats Reserved
1	Scheduled Caste (SC)	15%
2	Scheduled Tribe (ST)	7.5%
3	Person with Disability (PD) (including leprosy-cured)	3%

Reservation for candidates belonging to Other Backward Classes (OBC), if any, would be notified on the websites of IITs, as and when the Government orders for the same are issued.

A candidate belonging to SC/ST/OBC category must submit the requisite certificate issued by a competent authority as specified in **Appendix-II**, along with the Admission Form failing which his/her candidature for admission will not be considered under reserved category.

A Person with Disability (PD) must submit along with the Admission Form, the certificate of disability from a Government Medical Board and should be fit to pursue the programme. The candidates selected for admission under PD category will also be required to be certified by a Medical Board, duly constituted by the admitting institute for admission.

Note:

1. The provisions for the reserved seats given above are subject to modification in accordance with any Government order, if issued subsequently by the Government of India.
2. It will entirely be the responsibility of a candidate to prove his/her eligibility for admission in terms of minimum education qualifications, etc and for claiming reservation under a specific category at the time of submitting the Admission Form.

11. APPLICATION FORM AND FEE

The Application Form alongwith the Information Brochure and Acknowledgement Card will be available from **November 13, 2006** to **January 5, 2007** on cash payment of application fee of Rs.800/- for General Category Male candidates, Rs.700/- for General Category Female candidates and Rs.400/- for SC/ST candidates from the following Branches of Canara Bank:

Agartala (Banamalipur), **Agra** (Cantonment), **Ahmedabad** (Revdi Bazar), **Aligarh Main** (Apsara Complex), **Allahabad** (Civil Lines), **Amritsar** (DS Market), **Bangalore** (Town Hall), **Bareilly** (Civil Lines), **Bhagalpur** (MG Road), **Bhopal** (MP Nagar), **Bhubaneswar** (Bapuji Nagar), **Chandigarh** (Sector 17C), **Chennai** (IIT Campus and T Nagar), **Coimbatore** (Oppannakara Street)**, Darbhanga** (Lalbagh), **Dehradun** (Rajpur Road), **Delhi** (IIT Campus, Janpath, Maharani Bagh, Vivek Vihar), **Guwahati** (Fancy Bazar), **Hubli** (Traffic Island [Main])**, Haldwani** (Bareilly Road)**, Hissar** (Kamala Nagar), **Hyderabad** (Abid Road), **Indore** (MG Road), **Jabalpur Main** (MK Chowk), **Jaipur** (MI Road), **Jalandhar** (BMC Chowk), **Jalgaon** (Visanji Nagar), **Jammu Main** (Shalimar Road), **Jamshedpur Main** (Bistupur), **Jodhpur Main** (Jalori Gate), **Kanpur** (Mall Road), **Kharagpur** (Fatak Bazaar), **Kochi Main** (Mattancherry), **Kolhapur** (Laxmipuri), **Kolkata** (College Street and Gariahat), **Kurukshetra** (Railway Road), **Lucknow Main** (Hazratganj), **Meerut Main** (Abu Lane), **Moradabad Main** (Station Road), **Mumbai** (IIT Powai and Fort Market), **Nagpur** (Sitabuldi), **Noida** (Sector 20), **Patna** (Exhibition Road), **Pune** (Pune Camp), **Raipur** (Malviya Road), **Ranchi Main** (SN Ganguli Road), **Rohtak Main** (Civil Lines), **Roorkee** (Anaj Mandi), **Rourkela** (Bisra Road), **Secunderabad** (MG Road), **Shillong** (Gulasta Fancy Market), **Shimla** (The Mall), **Siliguri** (Panitankimore), **Thiruvananthapuram** (Cantonment), **Tiruchirapalli** (Teppakulam), **Udaipur** (Sethjiki Bari Madhuban), **Vadodara Main** (Lohana Building), **Varanasi Main** (Bansphatak), **Vijayawada** (Iron Centre), **Vishakhapatnam** (Daba Garden).

The Application Form and the Information Brochure can also be obtained by **Post** from the **JAM Offices** of **all IITs** by making a written request alongwith the Demand Draft of Rs.850/- (Rs.800/-application fee plus Rs.50/- postal charges) for General category Male candidates, Rs.750/- for General category Female candidates and Rs.450/- for SC/ ST candidates drawn in favour of "**Chairman, JAM, IIT Guwahati**" payable at Guwahati, and a self-addressed slip (11.0 cm x 6.0 cm). Such requests must reach the Chairman, JAM 2007, of any one of the IITs, on or before **December 26, 2006**. The application material shall be dispatched by Registered post/Speed post. The IITs, however, do not take any responsibility for the late delivery due to postal delay or loss of documents in transit. Once an Application Form has been purchased either from the Bank or by post from the JAM Office, any claim for refund of the fee, for any reason whatsoever, will not be entertained nor can this fee be held in reserve for future.

11.1. Online Registration: In addition to the conventional OMR Application Form,

the facility for Online Registration shall also be available through the website **http://www.iitg.ernet.in/jam**. A candidate can fill-in electronically, his/her personal data (Name, Nationality, Gender, Category, PD status, Date of Birth, No. of Test Papers Applied, Test Paper of First Choice, Test Paper of Second Choice (if any), Cities/Towns for the Test (First and Second choices), Name of Qualifying Degree, Qualifying Examination Passed, Year of Qualifying Examination, Percentage of Aggregate Marks/ CGPA, Email Address, Name of the Parent/Guardian, Relationship, Telephone Number and the Bank Draft details (Name and Code of the issuing Branch, Amount of Demand Draft, Date of Issue and Draft No.). **The information pertaining to the Photograph, Declaration and Signature will have to be provided by the candidates on the downloaded form to be obtained after successful completion of Online Registration on the website**.

If the candidate is appearing in **only one** test paper, the application fee is Rs.800/- for General category Male candidates, Rs.700/- for General category Female candidates and Rs.400/- for SC/ST candidates. If the candidate is appearing in **Two** test papers, the application fee is Rs.1000/- for General category Male candidates, Rs.900/- for General category Female candidates and Rs.500/- for SC/ST candidates. The appropriate application fee shall be payable along with the downloaded printed Online Registration Form, by the candidates in the form of a Demand Draft drawn in favour of **"Chairman, JAM, IIT Guwahati"**, and payable at **Guwahati**.

12. PROCEDURE TO APPLY FOR JAM 2007

The OMR Application Form enclosed in the envelope provided with this Brochure is to be completed in all respects. Carefully fill-in all the Items of the form after reading the instructions given in **Section-14**. **Refold the form only where it was originally folded**. Write the code(s) of test paper(s) and First choice of city/town of test on the Left portion of the envelope.

Those candidates who register themselves ONLINE, must complete the requirements pertaining to photograph, declaration and signature on the downloaded printed Registration Form to be obtained after successful completion of the Online Registration process on the website. The photograph should be glued at the appropriate place provided in the form. You may keep an identical photograph in reserve for future need. Also keep a photocopy of the form for your record.

The candidates desiring to appear for a second Test Paper must clearly mention their options in the OMR Application Form/Online Registration. Such candidates must also enclose a Demand Draft for the appropriate amount as specified in Subsection 7.1 (and Application Fee, in case of online registration), drawn in favour of **'Chairman JAM, IIT Guwahati'**, payable at **Guwahati**.

12.1. Acknowledgement Card: A printed acknowledgement card is enclosed with the OMR Application Form. Write your name and mailing address in the space provided and enclose this card with the Application Form after affixing postage stamp of Rs.6/-. The Organizing Institute will post the card immediately on receipt of your Application Form. **Do not staple** acknowledgement card with the Application Form.

In the case of online registration, on receipt of duly completed Online Registration Form along with requisite Demand Draft for application fee (as applicable) and second Test Paper fee (if any), an acknowledgement will be sent by the JAM Office of the Organising Institute, IIT Guwahati at the address given by the candidate.

12.2. Address for sending the Completed OMR Application Form/Online Registration Form:

Irrespective of the choice of the cities/towns of test centres (and of the JAM office from which the application form is obtained), the candidates must send:

Duly completed OMR Application Form alongwith Bank/JAM Office pay-in-slip, filled and stamped acknowledgement card and Demand Draft for the second Test Paper fee (if any), in the provided envelope,

OR

Duly completed Online Registration Form (downloaded and printed after successful registration on the website) alongwith Demand Draft for the appropriate application fee, including fee for the second Test Paper (if any) drawn in favour of "Chairman, JAM, IIT Guwahati" payable at Guwahati,

as the case may be, only at the following address:

Organising Chairman, JAM 2007
Indian Institute of Technology Guwahati
Guwahati – 781 039

The candidates are advised to send their completed Application Forms/Online Registration Forms by **Speed post/ Registered post only** and retain the receipt of posting. The completed applications can also be submitted in person at the JAM Office, Organising institute, IIT Guwahati, during office hours on working days.

12.3. Deadline for Receipt of Completed OMR Application Form/Online Registration Form:

Last date for receipt of the duly completed Application Form/Online Registration Form at the JAM Office, IIT Guwahati is **January 12, 2007**. Any Application Form/Online Registration Form received after this date will not be accepted. Any delay in receiving the application material by the candidate will not be considered as a valid reason for the late submission of the completed Application Form after the deadline. The Institute will not be responsible for any postal delay or irregularity or loss in postal transit.

13. ADMIT CARDS

Admit Card bearing the candidate's name, roll number, photograph, signature, category, the disability status and name(s) and code(s) of the Test Paper(s) applied alongwith name and address of the Test centre allotted will be sent by speed post/ registered post at the mailing address given by the candidate in his/ her OMR Application Form/Online Registration Form. The candidate should carefully examine the Admit Card received by him/her for all the entries made therein. In case of any discrepancy, the candidate should inform the Organizing Chairman, JAM 2007, IIT Guwahati immediately.

If the Admit Card is not received by March 9, 2007, then the Chairman JAM of the IIT Zone (see Appendix I), under which the first choice of City/Town of Test Centre of the candidate falls, may be contacted through Phone/Fax, giving the Application Form No./Online Registration No., name, mailing address and city code of the desired Test centre (first choice) to get the information about Roll number and name of the Test centre allotted.

No candidate will be permitted to appear in the Test without a valid Admit Card. The

Admit Card should be presented to the invigilators for verification. The Admit Card of JAM 2007 must be carefully preserved by the candidate to produce it at the time of admission/ registration, as may be required by the admitting Institute.

Those candidates who have not received their Admit Cards due to postal delay or some other reason will be issued Duplicate Admit Cards by the Presiding Officer of their respective Test centres, on the morning of the date of examination, **March 25, 2007** (before 8:00 am), on production of a photograph identical to that pasted on the Application/Online Registration Form and the Identity Card from the Institution last attended (original with a copy).

The Organizing Institute will not be responsible for any postal delay or irregularity resulting in non/late delivery of the Admit Card. A plea that the candidate failed to receive the Admit Card to appear at the JAM 2007 will not be accepted as a reason for the refund of application fee or any other redressal. The Organizing Institute may withdraw the permission granted to a candidate to appear at JAM 2007, if it is found that he/she is not eligible to appear at the Test even though an Admit Card has been issued by the Institute and is produced by the candidate before the Presiding Officer of the Test Centre.

14. INSTRUCTIONS FOR FILLING THE OMR APPLICATION FORM

Read the following instructions carefully and follow the SAMPLE filled-in Application Form on Page Nos. 14 and 15.

(a) Please note down the Application Form number in your personal record and keep a photocopy of the completely filled-in form for future reference.

(b) The Application Form will be processed by a machine, which picks up only dark pencil marks. The photograph, signature and address shall also be scanned by a machine that reads only dark black images and only from the specified areas of the form. Therefore, please ensure that you write your address and sign in Item numbers 16 and 17, respectively of the Application Form with **black ink ball-point pen and only inside the boxes**. Also, your photograph must be of a good quality (colour or black and white) taken not more than two months earlier.

(c) Fill-in the form in English only. First, write in capital letters the required information in the boxes above the bubbles (wherever provided), and then blacken out the appropriate bubble underneath each letter. **Darken the bubbles by using black (HB) pencil only.**

(d) Please note that the options filled by you in this form cannot be changed at a later stage.

(e) Please note that your name and your date of birth should be exactly the same as recorded in your High School (Standard X) Certificate. Any departure, whenever discovered, may lead to cancellation of your candidature.

(f) Your application must be complete in all respects. Incomplete Application Forms will be summarily rejected.

SIDE 1

INDIAN INSTITUTES OF TECHNOLOGY

JOINT ADMISSION TEST TO M.Sc. 2007 (JAM 2007)

APPLICATION FORM

INSTRUCTIONS

- READ THE INFORMATION BROCHURE CAREFULLY BEFORE FILLING THIS APPLICATION FORM.
- INCOMPLETE FORMS WILL BE REJECTED.
- USE ONLY HB PENCIL FOR DARKENING THE BUBBLES. DARKEN THE BUBBLES COMPLETELY.
- ERASE COMPLETELY BEFORE MAKING CORRECTIONS.
- USE BLACK INK BALL POINT PEN FOR WRITING IN THE BOXES.
- DO NOT MAKE ANY STRAY MARKS ON THE APPLICATION FORM.

CORRECT METHOD ●○○○

WRONG METHODS ⊘⊗◐◑

APPLICATION NUMBER 900001

1. NAME OF THE CANDIDATE (AS IN 10th CLASS CERTIFICATE) IN CAPITAL LETTERS

SAMSHEER SINGH

2. NATIONALITY

INDIAN ● NON-INDIAN ○

3. GENDER

MALE ● FEMALE ○

4. CATEGORY

SC ○ OBC ○

ST ○ GEN ●

5. PERSON WITH DISABILITY ?

YES ○ NO ●

6. DATE OF BIRTH

D D: 0 1 — M M: 0 9 — Y Y: 8 4

7. NO. OF TEST PAPERS APPLIED

2

ONE ①

TWO ●

8. TEST PAPER OF FIRST CHOICE

Code	Choice	Paper
BT	○	BIOTECHNOLOGY
CH	○	CHEMISTRY
CA	●	COMPUTER APPLICATIONS
GG	○	GEOLOGY
GP	○	GEOPHYSICS
MS	○	MATHEMATICAL STATISTICS
MA	○	MATHEMATICS
PH	○	PHYSICS

9. TEST PAPER OF SECOND CHOICE (IF APPLICABLE)

Code	Choice	Paper
BT	○	BIOTECHNOLOGY
CH	○	CHEMISTRY
CA	○	COMPUTER APPLICATIONS
GG	○	GEOLOGY
GP	○	GEOPHYSICS
MS	○	MATHEMATICAL STATISTICS
MA	●	MATHEMATICS
PH	○	PHYSICS

10. CHOICE OF CITIES/ TOWNS FOR THE TEST

I CHOICE: 2 2 — II CHOICE: 2 1

11. NAME OF THE QUALIFYING DEGREE

B.Sc. ●

B.A. ○

B.E. / B.TECH. ○

OTHERS ○

12. QUALIFYING EXAMINATION PASSED ?

YES ○

NO ●

13. YEAR OF QUALIFYING EXAM.

2 0 0 7

14. PERCENTAGE OF AGGR. MARKS/CGPA

7 6 • 3 5

APPLICATION NUMBER 900001

15. PHOTOGRAPH

16. NAME AND COMPLETE POSTAL ADDRESS (WRITE IN CAPITAL LETTERS IN BLACK INK BALL POINT PEN).

NAME SAMSHEER SINGH

ADDRESS : B - 29, INA COLONY

OPPOSITE VIKAS SADAN

NEW DELHI PIN CODE : 110023

17. SIGNATURE (IN BLACK INK BALL-POINT PEN)

Samsheer Singh

(Do not sign in CAPITAL / UPPERCASE LETTERS)

18. E-MAIL ADDRESS (IF ANY)

samsheer@gmail.com

19. NAME OF THE PARENT / GUARDIAN (IN CAPITAL LETTERS)

DAYANAND DAGAR

20. RELATIONSHIP OF PARENT/GUARDIAN TO THE CANDIDATE

- FATHER ●
- MOTHER ○
- GUARDIAN ○

21. PHONE NUMBER WITH STD CODE / MOBILE NUMBER

0 1 1 2 6 5 1 7 4 5 2

22. AMOUNT (Rs.) OF ADDITIONAL FEE PAID (IF APPLICABLE)

2 0 0

23. DETAILS OF THE DEMAND DRAFT ENCLOSED (IF APPLICABLE)

DEMAND DRAFT NUMBER: 5 3 5 4 7 6

DATE OF DEMAND DRAFT: D D = 2 7, M M = 1 2, Y Y = 0 6

24. BANK / JAM OFFICE PAY-IN-SLIP NUMBER

7 8 4 2 1 3

25. DECLARATION BY THE CANDIDATE :

I hereby declare that all the particulars stated in this Application Form are true to the best of my knowledge and belief. I have read the Information Brochure and I shall abide by the terms and conditions therein. In the event of suppression of or distortion of any fact made in my Application Form, I understand that I will be denied the opportunity to appear in the JAM 2007. If already appeared/selected/admitted, my admission / degree acquired is liable for cancellation.

Place : NEW DELHI

Date: 27 December 2006

Sameer Singh

(SIGNATURE OF THE CANDIDATE IN BLACK INK BALL POINT PEN)

You may now proceed to fill the OMR Application Form for the Item numbers as given below:

Item 1: Name of the Candidate
Fill-in your name in CAPITAL Letters, in black ink ball-point pen, as recorded in your High School (Standard X) Certificate. Write a single letter in each box. Do not leave any blank box within any part of the name. Leave one and only one blank box between any two parts of your name. If your name has several initials leave one blank after each of them. Darken the appropriate bubble under each letter of the name using black HB pencil.

Item 2: Nationality
Darken the appropriate bubble INDIAN or NON-INDIAN.

Item 3: Gender
Darken the appropriate bubble for MALE or FEMALE.

Item 4: Category
Darken the appropriate bubble: SC for Schedule Caste, ST for Schedule Tribe, OBC for Other Backward Class and GEN for General Category (all others).

Item 5: Person With Disability?
Darken the YES bubble if you are a Person with Disability (PD) candidate, else darken the NO bubble.

Item 6: Date of Birth
Write the day, month and year of your birth as recorded in your High School (Standard X) Certificate in the boxes under DD, MM and YY, respectively and darken the bubbles below accordingly. Use numerals 01 to 31 for day, and 01 to 12 for month, and the last two digits for the year of birth. For example, if date of birth is 1st September 1984, fill-in as follows:

D	D	M	M	Y	Y
0	1	0	9	8	4

Item 7: Number of Test Papers Applied
Enter the total number of Test Paper(s) (1 or 2) you wish to appear in the box provided and darken the corresponding bubble.

Item 8: Test Paper of First Choice
Darken the bubble shown against your choice of the First Test Paper.

Item 9: Test Paper of Second Choice (if Applicable)
In case you have chosen to appear in two Test Papers and indicated the same in Item 7, darken the bubble shown against your choice of the second Test Paper. Otherwise leave it blank.

Item 10: Choice of Cities/Towns for the Test
A candidate is allowed to give any two choices of the Cities/Towns for the Test from the list of cities/towns of JAM Test Centres given in **Appendix–I**. Write the codes of your FIRST Choice and SECOND Choice of the city/town in the corresponding boxes and darken the appropriate bubbles.

Item 11: Name of the Qualifying Degree
Darken the bubble shown against your qualifying degree. If the qualifying degree is other than B.Sc, B.A., and B.E. / B.Tech., darken the bubble shown against OTHERS.

Item 12: Qualifying Examination Passed?
If you have already passed the final examination of the qualifying degree, darken the YES bubble. If you are going to appear or already appeared (and awaiting for the

results) in the final examination, darken the NO bubble.

Item 13: Year of Qualifying Examination

Write the year of passing/appearing at the qualifying examination in the boxes provided and darken the appropriate bubbles.

Item 14: Percentage of Aggregate Marks/CGPA

Write in the box the percentage of aggregate marks or CGPA (for all subjects, all years combined) upto two decimal places, obtained in the qualifying examination or upto pre-final year/semester, if appearing in qualifying examination in 2007, as the case may be. Darken the bubbles accordingly.

Item 15: Photograph

Paste (do not staple) a 3.0 cm x 4.0 cm recent good quality (colour or black and white) photograph of yours. Note that the photograph must not be larger than the space (box) provided for pasting it. The candidates are advised to have some spare copies of this photograph with them. The photograph should neither be signed nor attested.

Item 16: Name and Complete Postal Address

Write your name and the complete postal address (in CAPITAL Letters in black ink ball-point pen) at which your Admit Card or any other communication is to be sent. The address must include your name, care of name if required, and other details including the PIN Code of the place.

Item 17: Signature

Put your usual signature using **black ink ball-point pen only within the box provided**. Your signature must not overflow or touch the border to the box provided. Your signature establishes your identity. **Do not merely write your name in capital letters.**

Please note that your signature here and the one below the declaration (Item 25) should be identical. Application Forms without signatures or with different signatures at the two places will be treated as incomplete and rejected.

Item 18: E-mail Address (if any)

In the space provided in the box, please write your e-mail address, if available.

Item 19: Name of the Parent / Guardian

Write the name of your parent or guardian in CAPITAL Letters. Write a single letter in a box. Darken the appropriate bubble under each letter of the name. Follow the instructions as given in Item 1.

Item 20: Relationship of Parent/ Guardian to the candidate

Darken the bubble against the relationship of Parent/ Guardian whose name is given in Item 19 to the candidate.

Item 21: Phone Number with STD code/Mobile Number

Write in the boxes STD Code and Telephone Number or Mobile Number through which you may be contacted. Darken the bubbles accordingly.

Item 22: Amount of Additional Fee Paid (if applicable)

Write in the box the amount (Rupees) of additional fee paid for appearing in the Second Test Paper according to the provisions in **Subsection 7.1.** Darken the bubble for each digit accordingly.

Item 23: Details of the Demand Draft Enclosed (if applicable)

Write in the boxes under Demand Draft Number, the number of the Demand Draft for additional fee (if applicable) to be enclosed with the Application Form and darken the bubbles below the boxes accordingly. Also write the day, month and year of the date of issue of the Demand Draft in the boxes under DD, MM and YY and darken the bubbles accordingly. Enclose the Demand Draft with the Application Form.

Item 24: Bank / JAM Office Pay-in-Slip Number

Write in the boxes, the Number of the Bank/JAM Office Pay-in-Slip (Refer: Six Digits Number appearing in the top portion of the Pay-in-Slip) for the purchase of JAM 2007 Application Form and darken the bubbles below the boxes accordingly. Enclose the appropriate part/copy of the Pay-in-Slip along with the Application Form.

Item 25: Declaration by the Candidate

The declaration is to be signed by the candidate using black ink ball-point pen. Read the declaration carefully before signing on it. The place and date should be written at the places marked for this purpose. Unsigned Application Forms will not be considered. Signature must be in running hand and should not be in capital/upper case letters.

Acknowledgement Card

Fill-in the Acknowledgement Card in all details and affix a postal stamp of Rs. 6/- on it. Unstamped/under-stamped cards will not be mailed.

For any correspondence with the JAM office of any IIT, please quote your Application Form Number until the Admit Card is received.

15. MERIT LIST

For each Test Paper, Merit Lists (All India Rank) on the basis of written test will be prepared for General, SC, ST and PD candidates separately.

15.1. Tie-Breaking: The Tie-breaking criterion for awarding the ranks to the candidates who score the same aggregate marks in a Test Paper shall be as follows:

(a) For Fully Objective Type Test Papers:

In case of equal scores, the candidate with higher ratio of positive marks to negative marks scored shall be given a higher rank.

(b) For Objective-cum-Subjective Type Test Papers:

The candidate having higher score in the Subjective questions of the Test Paper shall be given a higher rank.

In both the cases, if the above criteria failed to break the 'Tie', the concerned candidates shall be awarded the same rank.

The results (merit lists) of JAM 2007 shall be declared at 0900 hours on **April 24, 2007**. The results will be available on the website: **http://www.iitg.ernet.in/jam** and **http://www.iitg.ac.in/jam**.

There is no provision for scrutiny or re-evaluation of answer scripts. The Organising Institute will not entertain any correspondence in this regard. There is also no provision for declaration of the marks secured by a candidate in any Test Paper.

16. ADMISSION PROCEDURE

Only the candidates who qualify in JAM 2007 by obtaining a rank in the merit list of a Test Paper shall be eligible for admission to any of the corresponding academic programmes (refer Table-2) available at different IITs (refer Table-1). Candidates are advised in their own interest to refer to the brief profiles of the Institutes and participating departments included in this Brochure. Applicants should note that they have to apply for admission by sending an **Application Form for Admission** (henceforth called **Admission Form**) only to the Organising Institute (IIT Guwahati) for admission.

An applicant can apply to one or more academic programmes corresponding to the Test Paper in which he/she has qualified, subject to fulfillment of the minimum educational qualifications and the eligibility requirements of the admitting Institute(s). For the academic session 2007-2008, the Admission Procedure enumerated below

shall be followed for admissions to all the M.Sc. and other post-B.Sc. programmes covered under JAM 2007.

(i) After the JAM 2007 results are announced, a qualified candidate will have to apply on the prescribed Admission Form to the organizing institute (IIT Guwahati) irrespective of the IIT(s) where he/ she desires to seek admission. The Admission Forms will be sent along with Rank Card to the qualified candidates and will also be available on the websites of the organizing IIT from **April 25, 2007** onwards, which may be downloaded by the candidates. However, the candidates can also obtain the Admission Form (free of cost) from the JAM office of IIT Guwahati by sending a self addressed and stamped envelope (25cm x10cm size) affixed with **Rs.6/- stamps, so as to be received at IIT Guwahati, during April 25, 2007 to May 4, 2007** only.

(ii) A qualified candidate needs to send **only one** duly completed Admission Form listing all the M.Sc./post-B.Sc. programmes (along with the order of preferences) to which the admission is sought by him/her. In case multiple applications are made by any candidate for admission, all such applications are liable to be rejected if they happen to differ in the names of programmes or in the order of preferences of the programmes applied for.

(iii) The duly completed **Admission Form** along with desired enclosures must be sent by the applicant to the **Organising Chairman, JAM 2007, IIT Guwahati, Guwahati - 781039** alongwith an Account Payee **Demand Draft** of **Rs.300/-** (Rupees Three Hundred only), drawn in favour of **"Chairman, JAM, IIT Guwahati"**, payable at Guwahati as a non-refundable processing fee. It must be noted that the Admission Form either found incomplete in any respect or if not accompanied by a Demand Draft of Rs.300/- shall be rejected and the candidate shall not be considered for admission irrespective of his/her eligibility for any programme(s) for which Admission Form has been submitted by him/her to the organizing institute. Also, a candidate will be considered for admission only to the programme(s), given in his/her Admission Form. **The last date for receiving the completed Admission Form only at organizing institute (IIT Guwahati) is May 11, 2007**.

(iv) Organising IIT will process the Admission Forms received and get the eligibility of each applicant verified for each academic programme by the concerned IITs. Each Institute will prepare the list of all the eligible candidates for admission to its academic programmes and send it to the Organising Institute. The decision of the admitting institute on this matter will be final.

(v) Taking into consideration the order of preferences as given in the Admission Form and corresponding rank(s) in the merit list, in respect of only such candidates who are found eligible for admission by respective IITs, the First Admission List for each M.Sc./post-B.Sc. programme under JAM 2007 will be prepared by the Organising Institute and will be declared at 0900 hours on **May 29, 2007**. Once a candidate has been allotted a seat, his/her lower preferences, if any, will be automatically cancelled but he/she shall remain on the waiting list for all of his/her higher preferences, if any. Those eligible candidates, who are not allotted any seat in the First Admission List, shall remain on the waiting list as well.

(vi) After the declaration of the First Admission List, admission offers will be sent by the respective Institutes to the concerned candidates on **May 30, 2007**. Last date for conveying the acceptance of the offer and paying the prescribed fees by the candidate to the concerned Institute is **June 18, 2007**. Such candidates who are not able to get admission to their highest preference programme(s) will have to also inform in writing at the time of acceptance of the admission offer, as to whether they would like to be considered for their higher preference(s) programme(s) in the second round of admissions.

(vii) In case some seats remain vacant (from the First Admission List), the organising Institute will prepare a Second Admission List in respect of the vacant seats, from the wait-listed candidates and will be declared by the organising institute at 0900 hours on **June 25, 2007**. The admission offers based on the second admission list, if any will be sent by the concerned Institutes on **June 26, 2007**. These candidates will be asked to convey their acceptance of the offers and pay the prescribed fees latest by **July 11, 2007**. Such candidates who are not able to get admission to programme(s) of their highest preference will have to also inform in writing at the time of acceptance of the admission offer, as to whether they would like to be considered for programme(s) of their higher preference(s) in the third round of admissions.

(viii) In case some seats remain vacant (from the Second Admission List), the organising Institute will prepare a **Third** and **Final** Admission List in respect of the vacant seats, from the wait-listed candidates and will be declared by the organising institute at 0900 hours on **July 17, 2007** and the admission offers will be issued by the concerned Institutes on **July 17, 2007**. These candidates will be asked to convey their acceptance of the offers and pay the prescribed fees latest by the date decided by the admitting institutes**. With that the admission process based on JAM 2007 will come to an end**.

(ix) It is important to note that if an already admitted candidate is offered admission again against his/her higher preference programme in the next round, it will be mandatory for him/her to take admission in the latter programme at the allotted Institute, and his/ her presently occupied seat will be automatically treated as vacant and allotted to another eligible candidate simultaneously. In such a case, the admission fees deposited by the candidate earlier shall be transferred by the concerned Institute to the Institute of his/her new admission. However, additional dues, if any, shall be payable by the candidate on joining the new Institute.

(x) **It is important to note that there will not be any waiting list for admission after the third and final admission list.**

NOTE:

(a) Verification of minimum educational qualifications and the eligibility criteria for admission is the prerogative and sole responsibility of the admitting Institute(s) only and the Organising Institute will not respond to any queries in this regard.

(b) The offer of admission to a candidate will be provisional subject to the fulfillment of all the requirements by the dates specified.

17. BRIEF PROFILES OF IITs AND SCIENCE DEPARTMENTS

INDIAN INSTITUTE OF TECHNOLOGY BOMBAY

IIT Bombay was established in the year 1958 with the co-operation and participation of the then Government of USSR under UNESCO's technical assistance programme. Today the Institute is recognized as a center of academic excellence, offering engineering and science education at par with the best in the world.

Located at Powai, on the outskirts of Mumbai, the IIT campus extends over 500 acres of green wooded land with Powai and Vihar Lakes on either side. The campus is conveniently connected to the city center by buses and local trains.

IIT Bombay offers a large number of undergraduate and post-graduate programmes in engineering and sciences. The teaching programmes follow a semester system and are characterized by their flexibility and informality. An academic year (July-April) consists of two semesters, each of approximately 16 weeks duration. The departments, schools, centers and interdisciplinary groups constitute the academic fabric of the Institute. About 1800 undergraduate and 2900 postgraduate students, including foreign students are currently on the rolls. The faculty strength is about 400 and most of the faculty stays on the campus.

All the departments of the Institute have well-equipped research laboratories and related infrastructure. The Department of Science and Technology (DST), Government of India has sponsored a Sophisticated Analytical Instrumentation Facility (SAIF) at IIT Bombay to provide a wide range of modern analytical instruments for use in advanced research, such as Electron microscopy, X-ray Fluorescence, NMR etc. There are also a number of central facilities, such as the Computer Center, Workshops, as well as one of the finest technical libraries in the country, which houses over 3 lakh books and a large collection of periodicals and reference material. The library subscribes to over 1500 current journals in Science and Engineering and has access to all major journals through Sci-Finder, Chemical Abstract etc. The Computer Center provides high-end computing facilities to the Institute. It has several high performance computing machines, which include a 16 CPU Digital machine and several SUN servers.

The close proximity of IIT Bombay to Bhabha Atomic Research Center and The Tata Institute of Fundamental Research as well as major industrial establishments, offers excellent opportunities for interaction and collaborative research. A large number of projects at IIT Bombay are sponsored by organizations, such as DST, DAE, DBT, ISRO and CSIR as well as by industries. The Institute also actively collaborates with several organizations of other countries on a bilateral basis.

IIT Bombay is fully residential and has 13 hostels for students. Each hostel is an independent entity with its own mess facilities and recreational areas, etc. Each student hostel has a computer room with several PC's, which can directly access any server in the Institute through the Institute network. There are excellent facilities for sports, which include a swimming pool, tennis, badminton and squash courts and vast playgrounds for field games. Wildlife camps and trekking are popular off campus activities. The facilities for sports are matched by the cultural activities on

the campus: there are film clubs, classical music societies, debating and drama clubs and a hobbies club. There are also several associations, which organize social and cultural functions. The IIT Bombay campus offers a full and rich life characterized by the strong faculty-student interaction on the residential campus.
It may be noted that students are not permitted to operate and maintain motorized vehicles of any type in the campus, except on medical grounds.

Master of Science Programmes
The Institute offers two-year M.Sc. programmes in Applied Statistics and Informatics, Biotechnology, Chemistry, Applied Geology, Mathematics and Physics. Notable features of the M.Sc. programmes at this Institute are, a broad-based curriculum and course-credit system. Each course is designed as one semester course, carrying certain credits. The evaluation is based on continuous assessment throughout the semester by means of tests and quizzes. The semester-end examination is comprehensive, covering the entire course.
At the beginning of the second year, each student is assigned a two-semester project. The student is required to survey the available literature and carry out experimental/ theoretical/ computational / field work on a research level problem and submit reports in two stages. Another feature of the curriculum is the availability of courses in Engineering disciplines (including Computer Science and Engineering) and Humanities and Social Sciences. Outlines of the M.Sc. Curricula are given under the section on respective departments.

Institute Scholarships
The merit-cum-means scholarships of Rs.1000/- per month along with the benefit of free tuition are awarded every year by the Institute to a maximum of 25% of students of the B.Tech., five-year M.Sc., dual degree and two-year M.Sc. programmes. Another 10% of these students get the benefit of free tuition.
In addition to the above, there are several scholarships available to students joining the 2-year M.Sc. programme, on the basis of merit and merit-cum-means, instituted by private trusts and various government and semi-government organizations. The details are given in the section on respective departments.

Free mess facilities for Scheduled Caste/ Scheduled Tribe students: The facilities of free mess (only basic menu) and a pocket allowance of Rs.250/- per month will be granted to eligible SC/ST students of this Institute pursuing 2-year M.Sc. programme applying 'Means test' (income test), subject to certain conditions.
For more information and details about scholarships, see website, **www.iitb.ac.in**.

School of Biosciences and Bioengineering
The recent path-breaking developments in the application of engineering and technology to the biological and biomedical sciences, through Biotechnology and Biomedical engineering, have prompted the Institute to look for new initiatives that will further strengthen the bio-related activities in the Institute. A Senate committee had addressed this issue and had suggested the setting up of a School of Biosciences and Bioengineering for bringing these groups together under a common roof and consolidating bio-related activities being pursued in various Science and Engineering departments in the institute. As a result of these initiatives, the School of Biosciences and Bioengineering was formally launched on March 26, 2001.

The vision of the school is to be hailed as a center of excellence with an intense focus on teaching and research in areas of molecular, structural, computational biology, biomedical engineering and bioprocess technology towards making an impact on healthcare through New Knowledge, Processes, Products and Protocols.

The programmes offered by the school are (a) M.Sc. in Biotechnology (with financial support from DBT), (b) M.Tech in Biomedical Engineering, and (c) Ph.D. and Postdoctoral programmes. Some of the major facilities for teaching and research in Biotechnology include, Animal Cell culture facility, Radiotracer facility, HPLC, FPLC, Spectrophotometer, CD Spectrometer, Fluorimeter, PCR thermocycler, High speed and Ultracentrifuge and facilities for Biochemistry and Molecular Biology Research.

All the students admitted to M.Sc. Biotechnology programme are given a scholarship of Rs.800/- p.m. by the Department of Biotechnology, Government of India.

For more information, see **www.btc.iitb.ac.in**.

Department of Chemistry

The Department of Chemistry offers academic programmes leading to M.Sc. (2-year, post-B.Sc.), Integrated M. Sc. (5-year, admissions through JEE) and Ph. D. degrees. The department has 26 Faculty members, 125 Ph.D students and 110 M Sc. Students. The areas of research include: new synthetic routes and novel applications for organometallic/co-ordination compounds for semiconducting, catalytic, medicinal and material applications, new bio-inorganic compounds with unconventional and phototherapeutic attributes, polymers and biomaterials for optoelectronic and electrochemical sensing applications, biologically active organic compounds with varied medicinal applications as also of novel materials with superconducting, photofunctional, catalytic and photosensing properties. Biomolecular chemistry of membranes, peptides, photosensory biology, photomedicine, organized thin films, theoretical/ computational investigation of structure and dynamics of liquids, electron transfer processes in green plant photosynthesis and photodynamic control of chemical reactions, biomolecular thermodynamics, protein folding and ultrafast spectroscopy/dynamics are other areas of active research.

Findings from the investigations in the above mentioned areas are reported in about 125 publications per year in most prestigious journals and have been recognized through many fellowships of INSA, IASc., NASI and SS Bhatnagar, Swarna Jayanti and other awards.

The research facilities available in the department include: several FTIR and UV Spectrophotometers, GC and HPLCs; C,H,N analyser, spectropolarimeter, spectrofluorimeter, TGA/DTA, cyclic voltameter, Faraday magnetic susceptibility balance, powder and single crystal X-Ray diffractometers, 400 MHz and 60 MHz NMR facilities, QTOF mass spectrometer, peptide sequencer, nano-second / pico-second time resolved ultra-fast setup. PC’s and high end workstations with GAUSSIAN, SPARTAN, HYPERCHEM, GAMESS and GROMOS packages are also available within the department.

In addition to Institute Scholarships, two Dr. Burjor Godrej Merit Scholarships of Rs.5000 per month, six Dr. Burjor Godrej Merit cum Means Scholarships of Rs.2000 per month and ten Prof. M V Pandya Merit cum Means Scholarships of Rs.1000 per month are available to students admitted to M. Sc. Chemistry programmes at IIT

Bombay.
For more information, see **www.chem.iitb.ac.in**.

Department of Earth Sciences

The Department of Earth Sciences offers academic programmes leading to M.Sc. (Applied Geology), M.Sc. (Applied Geophysics), M.Tech. (Geoexploration) and doctoral degrees. The Department annually admits 25 to 30 students in its M.Sc. programmes, 10 students in its M.Tech. programme and about 5 students for the doctoral programme. Currently the Department has 14 faculty, 25 research scholars, 23 M.Tech. students and 35 M.Sc. students.

The main areas of current research in the Department include petrogenesis of Deccan Basalts, continental lithospheric structure of Western India, characterization and evaluation of geothermal springs of India, sedimentology of Proterozoic basins of India, Cenozoic micropalaeontology and applications in petroleum geology, fluid and melt inclusion research and ore genesis modeling, mathematical modeling and applications, GIS, remote sensing and applications in groundwater resources, modeling and analysis of slope stability and underground excavations, geochronology and thermochronology of NW Himalayas, structural analysis of Eastern Ghat mobile belt and Southern Delhi belt, metamorphic history of Western Chhotanagpur Terrane and applied mineralogy. Research work carried out in the Department leads to about 25-30 research publications per year in reputed journals.

The Department supports well-equipped laboratories that aid in teaching and research activities. Some of the major research facilities available are: X-ray diffractometer, scanning electron microscope with EDAX, UV and visible spectrophotometer, ICP-OES, atomic absorption spectrophotometer, optical systems for transmitted and incident light microscopy and cathode luminescence studies, heating and freezing stages for fluid and melt inclusion studies, equipments for triaxial compressive strength, tensile and shear strength, blast vibration monitor, tape extensiometer, magnetic susceptibility measurement systems, magnetometers, gravimeter, digital seismographs and advanced computational systems. Besides the departmental infrastructure, students and faculty have access to various facilities of other departments and centers.

The M.Sc. programmes in Applied Geology and Applied Geophysics builds a strong theoretical and practical framework to enable students to tackle routine work in industry as well as to take initiatives in challenging new areas. The close links that the department enjoys with the industry and research organizations has worked towards elevating the level and quality of education. The coursework is aided by introduction to computer programming (C^{++}) and computer applications in various fields. As a supplement to the various theoretical courses, the department also provides the students with an opportunity for field work. There are two educational field programmes in the 2^{nd} and 4^{th} semesters, respectively, apart from the practical industry training in mining and petroleum related industries at the end of 2^{nd} semester.

On completion of the programme, students can either go for higher studies or get placements in the leading industries/ organizations in the petroleum, applications software, mining and groundwater sectors.

For more information, see **www.geos.iitb.ac.in**

Department of Mathematics

The key objectives of the research and development activities of the department are: Basic Research, focusing in contemporary areas of fundamental, developmental and strategic importance; Interdisciplinary Research, aiming at development of multidisciplinary research teams involving mathematicians and scientists/engineers in frontier areas of Mathematics and Statistics; Academic Interaction, gearing towards establishment of individual and institutional contacts between the department of Mathematics and various educational and research and development organizations in the country.

The research areas include Algebra Analysis, Combinatorics, Geometry and Topology, Number Theory, Partial Differential Equations, Numerical Analysis, Statistics and Probability.

Apart from conducting Mathematics courses, which form the base for all B.Tech engineering disciplines, the department, at present runs two M.Sc programmes and a Ph.D. programme. The M.Sc. programme in Applied Statistics and Informatics is specially designed for students who aspire to take up professions that demand skills and techniques in Statistics and Computer Science. The course structure offers a unique blend of topics from Computer Science, Statistics and Mathematics.

The M.Sc. programme in Mathematics offers an exciting opportunity to students interested in higher studies in Mathematics or Statistics who wish to pursue careers in teaching and research. The broad objective of the Ph.D. programme is to generate quality manpower for Research and Development and Teaching. In addition to the merit-cum means and other scholarships given by the institute, the top two students in M.Sc. Applied Statistics and Informatics programme are given a scholarship of Rs.1200/- per month by Pfizer Limited.

For more information, see **www. math.iitb.ac.in**

Department of Physics

The department consists of about 28 faculty members. It offers a 4-year B.Tech. programme in Engineering Physics and a 5 year B.Tech.-M.Tech. Dual Degree in Engineering Physics and M.Tech. in Engineering Physics with specialization in nano-science. The department also offers a 2-year M.Sc. programme and a 6 year M.Sc.-Ph.D. dual degree programme in Physics. A very vibrant and active Ph.D. programme, in which about 50 research students are currently enrolled is a highlight of the department.

The department has a vibrant research programme in condensed matter physics, photonics, nuclear physics and high energy physics. It has well equipped laboratories to carry out experimental research in various thrust areas such as magnetic and superconducting materials, semiconductor thin films, multilayers and nanostructures, ultrafast processes and nonlinear optics and nuclear structure and reaction studies. Some of the major facilities of the department include sputtering, laser ablation and Langmuir-Blodgett facilities for thin film preparation, low temperature measurements and femto and nano second lasers. In view of the current interest of the Department in nano-science and technology, state of the art facilities such as high resolution x-ray diffractometer, low energy electron diffraction and scanning probe microscope have been setup. A versatile Surface Analysis Instrument consisting of Electron Spectroscopy for Chemical Analysis-Scanning Auger Nanoprobe has been setup in the department as a central facility of the institute. The department has presently undertaken over 20 RandD projects from various sponsoring agencies. It is also involved in several international collaborations and industrial consultancy projects. The research work carried out in the department

appears in the form of over 50 research publications per year in reputed journals and in a large number of presentations by the faculty and Ph.D. students at national and international forums.

The M.Sc. programme has been designed to make the foundations of Physics strong in our students. The 6 year dual degree programme of M.Sc. and Ph.D. in Physics is essentially an extension of the existing M.Sc. programme leading to a Ph.D. degree. The curriculum includes substantial basic preparation in Mathematical Physics, Classical, Quantum and Statistical Mechanics, Electromagnetic theory as also courses in Atomic and Molecular Physics, Condensed Matter Physics, Nuclear Physics and Quantum Electronics. This is complemented by intensive laboratory program, including laboratory courses in Electronics and Computer Programming. Specialization in specific areas of Physics is offered through elective courses such as Elementary Particle Physics, Applied Solid State Physics, Applied Nuclear Physics and Photonics. An avenue into contemporary research is provided through a year long M.Sc. Project with individual supervision. Our research laboratories and computational facilities help in acquainting the students with methodologies of modern day research and play a very crucial role in shaping them as future scientists. Efforts are also made to continuously review the scope and content of our teaching program to keep it on tune with the modern developments both in experimental as well as theoretical physics. Some of the recent additions to the M.Sc. curricula are, Methods in Analytical Techniques, Methods in experimental Nuclear and Particle Physics, Nonlinear Dynamics and advanced simulation techniques in Physics.

For more information, see **www.phy.iitb.ac.in**

Fees, Deposits and Hostel Rent*

Sr. No.	Fee	Amount (in Rs.)	
		With Hostel	Without Hostel
1	Admission Fee and other one-time payments	1225/-	1225/-
2	Tuition Fee and other semester Fees	5950/-	2600/-
3	Deposits	3000/-	2000/-
4	Annual Fee	126/-	126/-
	Total	10,301/-	5,951/-

SC/ST category students are fully exempted from paying tuition fee (Rs 1500/-). Hence the total fees to be paid by them at the time of admission are Rs. 8,801/- (with hostel) and 4,451/- (without hostel).

* Subject to change

INDIAN INSTITUTE OF TECHNOLOGY DELHI

IIT Delhi is situated at Hauz Khas in South Delhi, bounded by Sri Aurobindo Marg on the east, Jawaharlal Nehru University complex on the west, National Council of Educational Research and Training on the south, and the Outer Ring Road on the north. The Institute campus is about 20 km from Indira Gandhi International Airport, 10 km from domestic terminal of the airport, 19 km from Delhi main Railway Station and 14 km from New Delhi Railway Station.

The Institute campus extends over an area of 320 acres with many topographical features, imaginatively laid out with picturesque landscape. With clean and wide roads, and lot of greenery around, the campus presents a spectacle of harmony in architectural and natural beauty. Most of the students, faculty and staff reside on the campus. The main academic building houses various teaching and research facilities. Although each department is a separate entity, all the departments together constitute an integrated complex.

Each academic year consists of two semesters and a summer term. The education system is organised around a credit system, which ensures continuous evaluation of student's performance and provides flexibility to choose courses so as to facilitate progress at an optimum pace suited to one's ability or convenience. Each course is assigned certain number of credits depending upon the class contact hours. A minimum number of credits are to be completed in order to qualify for the award of a degree. A minimum level of performance is necessary for satisfactory progress/completion. IIT Delhi has revised its M.Sc. curriculum with effect from academic session 2005-2006. The revised curriculum emphasises on self-learning, project activity and laboratory work and leaves sufficient time for a student to take part in other activities like sports and recreation as well as to think and be creative and innovative.

The Students Activity Center provides a number of facilities for student's extracurricular activities and physical development. It has a central two-storied block with a swimming pool and a gymnasium hall with amenities such as squash courts, hobbies workshop, seminar rooms, music rooms and other multipurpose rooms for reading and indoor games. The amphitheater constructed in modern style is an added amenity to the center. The campus also provides other amenities such as staff club, hospital, shopping center, banks, post office, community center, stadium and playing fields.

Credit System

The prominent features of the credit system are the process of continuous evaluation of a student's performance, the absence of pass or fail on annual basis and the flexibility to allow a student to progress at the pace suited to his/her individual ability and convenience subject to the regulations of the credit requirements.

Each course, except for a few special courses, has a certain number of credits assigned to it depending on its lecture, tutorial and laboratory contact hours in a week. Each course is coordinated by a member of the faculty called the course coordinator. He/she has the full responsibility for coordinating the course, coordinating the work of other members of the faculty involved in the course, holding tests and awarding grades. In case of any difficulty, students are expected to approach the course coordinator for advice and clarification.
A letter grade with a specified number of grade points is awarded in each course for which a student is registered. A student's performance is measured by the number of credits that he/she has earned and by the weighted grade point average maintained by him/her. A minimum number of credits and a minimum grade point average are necessary in order to qualify for a degree.

Department of Chemistry

The Department of Chemistry offers a two-year M.Sc. programme in Chemistry. It includes basic courses in inorganic, organic, physical and bio chemistry. Topics of current interest are taught as elective courses. These courses include supramolecular chemistry, solid state chemistry, bioorganic chemistry, bioinorganic chemistry, organometallic chemistry medicinal chemistry and molecular simulations. Students are initiated into research methodology through specialized laboratory research and review of literature in the form of project report-cum term paper. Representatives from several companies annually visit the department to recruit students for their establishments. The department has well equipped laboratories with modern instruments like UV, FT-IR, Far-IR, NMR, TGA/DTA, Atomic absorption spectrometer, polarimeter, Ion chromatograph, HPLCs, GPC, XRD, Single Crystal X-ray diffractometer and other sophisticated instruments for chemical analysis.
The department has the following central facilities:
1. Glass Blowing Workshop
2. NMR Spectrometer
3. Supercomputing facility for Bioinformatics and Computational Biology

In addition, Department of Chemistry has access to other instrumental facilities like Scanning electron microscope, Transmission electron microscope, Atomic force microscope etc. from the Institute network of sophisticated equipments (called Central Facilities) for advanced research.
Further, the department is supported by a large number of sponsored research and consultancy projects which has resulted in several patents and research publications in national and international journals. Many faculty members of the department have been conferred various national and international awards and other recognitions.
Doctoral and post-doctoral research is carried out in identified thrust areas of national and international relevance.

Department of Mathematics

The Department of Mathematics is actively engaged in teaching and research in the areas of Pure Mathematics, Applied Mathematics, Numerical Analysis, Statistics, Operations Research, and Computer Science and Applications. The department has well established and widely recognized research activities. Both fundamental and applied research is being carried out in many important areas recognized at national and international levels. Research contributions of the department are published in international journals of repute.
The department runs a 5-year Integrated M.Tech. Program in Mathematics and

Computing (admission through JEE) and a 2-year M.Sc. program in Mathematics.
The two year M.Sc. Program in Mathematics covers courses in the area of Pure and Applied Mathematics, Numerical Analysis, Statistics and Operations Research, and Computer Science and Applications. The department has well equipped computing Labs and has most of the standard Mathematical Softwares. All students are required to do Major Projects for one-year duration in the area of their choice in the second year.
The department is also a major participant in running the 2-year Interdisciplinary M.Tech. Program in Computer Applications.

Department of Physics
The Department of Physics is one of the largest departments in the Institute with a number of teaching and research laboratories. The department runs a four year B.Tech. programme in Engineering Physics, a two-year M.Sc. programme in Applied Physics and two-year M.Tech. programmes in Applied Optics and Solid State Materials. An interdisciplinary M.Tech. programme in Optoelectronics and Optical Communications is also jointly run with Department of Electrical Engineering.
Major research and development activities are in the areas of Solid State Physics, Thin Film Technology, Nano Science and Technology, Materials Science, Nano-electronics, Spintronics, Applied Optics, Quantum Optics, Fiber and Integrated Optics, Laser Spectroscopy, Bio-physics and Plasma Physics. State of the art facilities for carrying out both fundamental and applied research, comparable to the best institutions in the world are available in these areas. The department has the unique distinction of six of its faculty members receiving Shanti Swarup Bhatnagar Award and majority of the faculty members being recognized for their research contributions both at national and international level.
Being at an Institute of Technology, the M.Sc. Physics programme is designed to impart education and training with an emphasis on applied topics. In addition to the compulsory core courses, which every student of M.Sc. has to take, one can opt for elective courses out of a variety of advanced and applied courses. Students also gain considerable hands-on-experience through a project, which helps them learn design principles, analytical techniques and scientific organizational skills.
State of Art analytical facilities like HRTEM, AFM, STM, SEM, GAXRD and ESCA/AES are available for benefit of students.

Scholarships Merit-cum-Means Scholarship: Merit-cum-means scholarship of Rs.1000/- per month and free tuition are permissible to M.Sc. students to the extent of 25% of the sanctioned strength subject to a maximum of five in each department as per Institute rules. Only those students are eligible whose parents gross income is less than Rs.2.00 lakh per annum for all categories of students, including SC/ ST students. The terms and conditions of the award of scholarship including conditions for continuation are laid down in the Rules and Regulations and are subject to change from time to time.
Apart from above, the following scholarships instituted by outside organizations/ individuals are also available for M.Sc. students:

(a) The **National Board of Higher Mathematics** conducts examinations and offers scholarships to successful candidates for pursuing the M.Sc. Program in the department of Mathematics.

(b) **Prof. Prem Kumar Merit Scholarship in the Deptt. of Mathematics :** One Scholarship of the value of Rs.1000/- per month will be given for a period of

10 months to 2nd year student based on Merit.

(c) **Amarchand Memorial Scholarship in the Deptt. of Mathematics :** Two merit scholarships of the value of Rs.400/- p.m. (each) to be awarded to a first year and a second year student of M. Sc. (Mathematics) for ten months.

(d) **Dr. R.S. Narayanan Memorial Scholarship in the Deptt. of Physics:** Four Merit-cum-Means Scholarships, each of the value of Rs.300/- p.m. will be given to the meritorious M. Sc. (Physics) students of each year.

(e) **Prof. Vidhya Bhushan Anand Memorial Scholarship in the Deptt. of Physics :** A scholarship of Rs.500/-per month will be given to an M. Sc. (Physics) final year student who secures the highest CGPA (minimum 8.0) at the end of 1st year.

(f) **Mr. Biman Behari Sen Memorial Scholarship:** A Scholarship of Rs.1500 p.m. will be given for a duration of 10 months to the best students in M.Sc.(Final) Physics Deptt. securing highest CGPA.

(g) **Madan Lal Parliwala Memorial Loan Scholarship:** This Loan scholarship is available for 3 full-time M.Sc. Students (one each in Chemistry, Mathematics and Physics) at 1st year level, and continues till the successful completion of the programme.

(h) **Suman Gupta Memorial Scholarship:** Scholarship of Rs.1000/- p.m. is awarded to a student of 1st year M.Sc. Mathematics for a period of 10 months in academic session on the basis of Merit-cum-Means.

Fees and other Payment*

(a) **Institute's fees payable at the time of admission:**

Rs.8535/- for General candidates if allotted hostel
(Rs.7735/- for non-hostel).
Rs.6035/- for SC/ST candidates if allotted hostel
(Rs.5235 for non-hostel).

(b) **Mess dues payable:**

Rs.10550/- (Rs.9550/- for girls) – if hostel allotted.

* Tentative and subject to change

INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI

Indian Institute of Technology Guwahati, the sixth member of the IIT fraternity, was established in 1994. The academic programme of IIT Guwahati commenced in 1995.

At present the Institute has eleven departments covering all the major engineering and science disciplines, offering B.Tech., B.Des., M.Tech., Ph.D. and M.Sc. (both 2 year and integrated) programmes. It provides an ideal setting far from the hustle and bustle of unban India- for learning and research. It is a fully residential institute for the students, like all the IITs of the country. Within a short period of time, IIT Guwahati has been able to build up world class facilities for carrying our advanced research. With a campus conducive to learning, with young and dynamic faculty, with some of the best students of the country, IIT Guwahati is the place to study in, is the place to visit.

IIT Guwahati campus is on a sprawling 285 hectares plot of land on the north bank of the river Brahmaputra around 20 km from the heart of the city. With the majestic Brahmaputra on one side, and with hills and vast open spaces on others, the campus qualifies as one of the most beautiful educational campus in the country. While the campus construction programme will terminate at the end of the tenth five year plan, students' hostels, faculty and staff quarters, and a guest house have already been built.

Department of Chemistry

The 2-year M. Sc. programme offered by the department of Chemistry consists of intensive course work followed by a research project in the final semester. At the end of the programme, students have a sound knowledge and exposure to the emerging areas of chemistry and hands on experience necessary to take up assignments in academics, industry and research laboratories. Department has also recently started integrated M.Sc. in Chemistry for which admission is through JEE.

The undergraduate laboratories of the department are equipped with state-of-the-art experimental set ups. The research laboratories have facilities for carrying out advanced experimental research including projects sponsored by external funding agencies. The Department has created single XRD facility through FIST grant from DST, New Delhi.

In addition to the central facilities like scanning electron microscope, NMR etc. in the institute, the department has good computing facility. Some of the state-of-the-art instruments available in the department are Elemental analyser, Thermogravimetric analyser, Differential scanning calorimeter, Ion meter, Gas chromatograph, High-pressure liquid chromatograph, Medium-pressure liquid chromatograph, Magnetic balance, Electrochemical analyzer, FT-IR spectrophotometers, Langmuir-Blodgett UV-visible spectrophotometers, Langmuir-Blodgett film maker, Cryocoolers, Fluoro-cube Spectrometer, GC-Mass spectrometer.

Department of Mathematics

The Department of Mathematics at Indian Institute of Technology Guwahati offers a 2-year M.Sc. programme in **Mathematics and Computing**. This programme blends relevant mathematics and computer science courses covering theoretical, computational and practical aspects. The laboratory based courses give students the exposure and training in application-oriented practical subjects. Students are exposed to advanced research topics through a mandatory one year project work.

At the end of the programme, students acquire sound analytical and practical knowledge to formulate and solve challenging problems and are well prepared to take up jobs in software industries or to pursue higher studies. Round-the-clock access to computer labs and a large up-to-date library help students to supplement their knowledge. The department has a state-of-the-art computing laboratory which equipped with several PCs and HP serves and connected to the PARAM computer of the Institute. Regional NBHM Library is also housed at IIT Guwahati.

Besides the 2-year M.Sc. programme in **Mathematics and Computing** and Ph.D. programme, the department also offers a 4-year B.Tech. programme in **Mathematics and Computing** for which admission is made through JEE.

Career Opportunities: Students are assisted through the Placement Cell of IIT Guwahati to secure suitable jobs during campus recruitment. Most of our students secure jobs in reputed companies through campus recruitment. Student desirous of pursuing higher studies have the option to join the Ph.D. programme of the department after qualifying GATE or NET.

Department of Physics

The Department of Physics at IIT Guwahati started functioning in the year 1995 offering core, science elective and open elective courses for B.Tech. program. Ph.D. program was started in 1996 and two year M. Sc. program was added in July 2000. Since 2006 a four year B. Tech. Engineering Physics program is added to train bright students as engineer having flair for Physics, for which selection is made through JEE. The Department is engaged in carrying out research in pure and applied areas of Physics and strives to train students to turn them into competent and motivated Physicists/scientist. The department has state of art B. Tech and M. Sc. laboratories.

Apart from imparting training in the fundamentals of Physics and allied areas through a set of core and utility courses, the M.Sc. program also equips the students in their chosen specialization through elective and advanced laboratory courses besides a one-semester project. A state-of-the-art numerical and computing laboratory of the department provides extensive exposure to various aspects of computer applications and numerical analysis.

Students admitted to Ph.D. program undergo extensive course work in Physics during the first semesters and thereafter start research in frontier areas of pure and applied physics including interdisciplinary areas. Ph.D. students also take part in teaching assistantship of B.Tech. and M.Sc. computing laboratory courses.

Intense research activities are going on in the areas of **Condensed matter Physics** (colossal magnetoresistance materials, defects in ionic materials, electronic structure theory, magnetic materials, nanoparticles, quantum computation, semiconductors, photovolatic materials and devices, shape-memory alloys, superconductors, etc), **Laser and Photonics** (fiber and integrated optics, laser matter interactions, interferometry, nanophotonics, photonic glasses, nanolithography, non linear optics etc), and **Theoretical Physics** (higher dimensional bosonization, high-energy

physics phenomenology, correlated electrons and statistical physics, string theory, etc).

Major research facilities available in the department are Q switched high power Nd: YAG laser, Laser Ablation set-up, Multiple beam interferometry set-ups, Fibre optics communication set-up, non linear optical characterization set-up, fibre and wave guide characterization set-up, Monochromators, CCD, Atomic Force Microscope (AFM), closed cycle Helium refrigerators, powder X-ray difractometer, differential scanning calorimeter, wide range of spectrometers for optical characterization, low temperature resistivity set-up, a.c. magnetic susceptibility set-up, several high temperature furnaces, hot press, rotary and planetary ball mills, several sophisticated Test and Measurement equipment, etc.

The Institute offers three kind of scholarships:

(1) Merit Scholarship: Given to one candidate starting from his second year who secures highest CPI in his first year. The candidate gets Rs.500 per month and his Tuition Fee is waived.

(2) Merit-cum-Means: Given to candidates with family income less than Rs.2,00,000 and has a CPI of 6.5 (or 60%) in his B.Sc. For general candidates the stipend is Rs.1000 per month and Tuition fee is waived. For SC/ST candidates, they get Rs.250 per month and the Mess bill is waived.

(3) Based on the first years performance, female students may be selected for stipend from Indian Women's Association, Bonn (IWAB). There is no fixed amount and depends upon the interest available from the fund.

Fees and Payment*:

(a) Tuition and Admission Fee

General Category : Rs. 6800/-
SC/ST Category : Rs. 3800/-

(b) Deposit: Rs. 4000/-

* Tentative and subject to change

INDIAN INSTITUTE OF TECHNOLOGY KANPUR

Indian Institute of Technology Kanpur is engaged in carrying out original research of significance and technology development at the cutting edge. It imparts training to students so that they become competent and motivated engineers and scientists. The Institute celebrates freedom of thought, cultivates vision and encourages growth, but also inculcates human values and concern for the environment and the society.

IIT-Kanpur is located on the historic Grand Trunk Road, 15 km west of Kanpur City and measures close to 420 hectares. This land was gifted by the Government of Uttar Pradesh in 1960 and by March 1963 the Institute had moved to its current location. If someone had visited it then, he/she would have seen a standing crop, acacia woods, long winding rows of stately mango trees, flocks of peafowl and a conventional countryside scene of India. The residential campus is planned and landscaped with a lot of environmental concern. Halls of residence, faculty and staff houses and community buildings surround the central academic area to provide easy movement and communication. The person who brought this mammoth transformation was Mr. Achyut Kanvinde, a Pune-based architect. The rich cultural diversity of India is reflected in the campus activities of IIT-Kanpur as well.

The Institute awards Bachelors, Masters and Doctoral degrees in various branches of technology and science. There are about 2255 undergraduate and 1476 postgraduate students, 306 faculty, and, more than 850 supporting staff. It has one of the finest scientific and technological libraries with an online information retrieval system over the campus LAN. In addition to offering formal Undergraduate and Post-graduate Programs, the Institute has been involved in Continuing Education and Research and Development in areas of value to both the Industry and the Government.

From its very inception, IIT Kanpur has been striving to develop itself into an institution of excellence in education and research in consonance with the contemporary and future needs of India. In meeting this challenge, the Institute has always been making special efforts to recruit talented faculty on a world-wide basis and to admit brilliant students from all over the country by a careful selection process. Continuous efforts have been made to provide the faculty with well-equipped facilities to enable them to participate in national endeavors in Science and Technology in a major way. In a very short span, the Institute has attained recognition as a major center of learning in Engineering, Science and several Inter-disciplinary areas. The Institute has been served by illustrious Directors. Not only has the Institute acted as the breeding ground for ideas and talent, it also has recognized and honoured scholars of distinction.

The combined record of its past and present faculty and students along with the alumni spread across the world is awe-inspiring. With path-breaking innovations in both its curriculum and research, the Institute is rapidly gaining a legendary reputation.

CAMPUS

The I.I.T. Kanpur campus is a residential campus offering accommodation to the entire faculty, about 700 support staff, and students. The campus has all the amenities for developing the personal, social and academic skills of the community.

Campus Amenities:

- Health Center (HC) equipped with pharmacy, clinical Laboratory and a 30-bed Indoor Ward. Emergency care is provided round-the-clock.
- Branches of State Bank of India and Union Bank of India.
- Post office and Telecom bureau.
- Well planned shopping center which also has a branch of the State Bank of India.
- Transport facilities.
- Outdoor Courts for Basket Ball, Volley Ball, Tennis and Indoor Courts for Badminton, Fields for Hockey, Football and Cricket, Gymnastics and Indoor Gymnasium.
- Olympic-size 8-lane Swimming pool.
- Gliding and Soaring Center provides an opportunity for learning gliding. Facilities are offered for obtaining glider pilot's license.
- Language Laboratory with computer controlled audio and video components, offers courses in foreign languages like French, German, and Japanese.
- Students Activities Center (SAC) housing various Hobby Clubs viz., Fine Arts, Photography, Astronomy, Electronics, Debate, Indian Music, Theatre Workshop, Aero-modeling.
- Visitors' Hostel (Guest House).
- Nine boy's hostels and two girl's hostel.
- 1200 capacity Auditorium.
- Parks and green sanctuary areas.

SCIENCE DEPARTMENTS

Department of Chemistry

Department of Chemistry is one of the premier departments in the country today. The strength of the department has been and continues to be excellence in research and teaching. The faculty of the department is extremely motivated with a strong commitment to teaching and research. This is reflected in the fact that the faculty has been recognized both nationally and internationally. Some of the awards include: DST's J.C. Bose Fellowships, Ramanna Fellowships and Swarnjayanti Fellowships; INSA Young Scientist Medals, S.S. Bhatnagar Awards, Associate ships and Fellowships of National and International Academies. The department also attracts funding in the form of projects from various national and international sources such as DST, DAE, DOD, CSIR, Wellcome Trust etc. The department also conducts consultancy projects. The alumni of the department occupy high positions in industry and academia both in India and abroad. Their accomplishments have been reflected on the high quality training imparted to the students both at the undergraduate and post graduate level. The department has well equipped laboratories with Laser induced Fluorescence and Mossbauer Spectrometers, Nanosecond Single Photon Counting Fluorimeter, CCD-X-Ray, State-of-the-Art NMR (400 and 500 MHz) and

EPR Spectrometers, ESI Mass Spectrometer, FT-IR Spectrometer, electrochemistry equipment etc.

Department of Mathematics and Statistics

The Department of Mathematics and Statistics (earlier known as the Department of Mathematics) shares the vision of the Institute in striving for excellence in research and teaching activities. The department has succeeded in this endeavor to a large extent. Over the years, the department has evolved as one of the premier departments in the country providing excellent teaching and research in Mathematics and Statistics. The department takes pride in having produced highly qualified and motivated mathematicians who are providing leadership in different educational institutions and RandD organizations in India and abroad. The vibrant academic environment of the department is nurtured by strongly motivated faculty and students. Contributions by the faculty in research and teaching have won them many recognitions from the scientific community including the prestigious S.S. Bhatnagar award, Meghnath Saha Award, Chandna Award, INSA Young scientist Medal and Fellowships of National and International Academies. The department has a number of sponsored projects funded by agencies like CSIR, DST, DAE (NBHM, BRNS).

The current pace of advancement of technology needs a coherent back up of basic science education and research. The vibrant academic ambience and research infrastructure of lIT Kanpur provides an opportunity to pursue teaching and research in the front line areas of basic sciences as well as in interdisciplinary areas of science and technology. The department encourages interdisciplinary trends with the help of the expertise available at this Institute. In the coming decade, apart from the existing areas, the department intends to develop areas related to mathematical aspects of computing science in all its manifestations.

The department has a well-equipped PC lab, providing computing and remote access facilities exclusively to the department students. It also has a Parallel Computing Lab and its own computer server. The department has a well stocked departmental library. The P. K. Kelkar library of the Institute has been identified as a Regional Library for Mathematics by the National Board for Higher Mathematics (NBHM), thereby catering to the needs of mathematicians in the geographical area.

Department of Physics

The Department of Physics was started in 1961, at the time of the founding of the Institute. The mandate of the department is to:

- Teach Courses for students of science and engineering disciplines
- Conduct research in pure and applied physics; and
- Conduct interdisciplinary studies, especially with engineering departments and interdisciplinary programmes of the Institute.

Over the years the department has evolved into India's premier physics teaching institution and has also made significant contributions to research and the development of science in India. IITK alumni may be found among the Faculty of most of the research institutes in India, and some are among the best scientists, teachers and researchers not only in India, but also abroad. The department has a present strength of 35 faculty members, 73 doctoral students and a team of scientific officers, research associates and post-doctoral fellows. The Department of Physics conducts cutting-edge research in a wide range of theoretical and experimental areas. In particular, there is a very strong Condensed Matter Physics group and

smaller, but very active groups in Theoretical High Energy Physics, Lasers and Quantum Optics and Experimental Nuclear Physics. Many of the faculty also conduct research in converging and Interdisciplinary areas.
The department has one of the best low temperature and laser facilities in the country. Apart from these, there is a liquid Nitrogen Plant with a 25 litre/hr capacity and a Liquid Helium Plant with a 10 litre/hr capacity. These facilities are further augmented by excellent machine shops and central laboratories for SQUID, High magnetic fields, Laser processing of thin film, EPR, NMR, single-crystal X-ray Diffraction and Electron Microscopy. The department also has a Van de Graaf generator, which is mostly used for Materials Science research. Apart from this, the department has a reasonably well-stocked library, extensive computational facilities and a fast internet link (2 Mbps). The Department has a computer center housing several Pentium PCs.

FINANCIAL ASSISTANCE
Merit-cum-means scholarship of Rs. 1000/- p.m. plus free tuition is available for up to 25% of the students. Free tuition for an additional 10% students is also available.
Two Scholarship each of Rs. 2500/- p.m. along with a contingency grant of Rs. 3000/- per annum per candidate, given by Associated Cement Company, are available for the M.Sc. Students in Chemistry.
M.Sc., Ph.D. (Dual Degree) Students in the Physics Department, who are having good academic performance are entitled to scholarship of Rs. 3000/- p.m. for semesters I-III, Rs. 8000/- p.m. for semesters IV-VII and Rs. 9000/- p.m. thereafter.

FEE CONCESSION
A 50% waiver in tuition fee may be given to some students on case-to-case basis based on their performance after the first semester.

CONCESSION TO SC/ST CANDIDATES:
In each discipline, 15% seats are reserved for SC and 7.5% seats are reserved for ST category candidates. Such candidates must also satisfy the minimum prescribed qualifications. However, admission offers are made to only those who are found suitable through the written test without compromising with candidates of other categories. Railway fare is paid to all SC/ST candidates for joining the Institute after selection. They are given 100% waiver in tuition fee. Also no hostel seat rent is charged if the annual income of their respective parent/guardian is less than Rs. 2,00,000/-
In addition 3% seats are reserved for Physically Handicapped candidates. Certificate of disability to be attached at the time of admission.

FEES AND PAYMENT*:
(a) Tuition and Admission Fee: Rs. 7992/-
(b) Refundable Deposit: Rs. 4000/-
(c) One time fees: Rs. 2150/-

* Tentative and subject to change

INDIAN INSTITUTE OF TECHNOLOGY KHARAGPUR

The Indian Institute of Technology Kharagpur, founded in 1950, is the first of seven technological Institutes for higher learning set up by the Government of India. It is located at Hijli near Kharagpur in the Midnapore (West) district of West Bengal. In 1957 the Institute became an autonomous body with the status of university and was declared an Institute of national importance by an act of parliament. The Institute campus grew around the once infamous Detention Camp of Hijli and sprawls over an area of 1400 acres of land gifted by the Government of West Bengal. The student population has increased from 224 in 1951 to 5000 in 2003, the faculty strength from 42 to 500. There are fifteen halls of residence for students, including three for girls. There are a composite stadium, a swimming pool, a student center with a gymnasium, an indoor stadium and six canteens catering foods of all regions of India, a large open air theater and a spacious air conditioned auditioned auditorium, a hospital and a shopping center. The library allows direct access for fourteen hours a day and offers all modern facilities.

The Institute provides instructions leading to degrees in various branches of engineering and technology, in architecture, and in the sciences. The students are admitted from all parts of India and from, neighboring and overseas countries regardless of their sex, race, creed, caste or class. The Institute is completely residential in character. It awards graduate, postgraduate and research degrees in various branches of engineering science and the humanities. It also provides short-term professional courses for executives and technologists from the industries and from Government departments. The Institute also runs a Quality Improvement Programme for the benefit of teachers of Engineering Colleges all over the country. The objective of the Institute is to foster in its students a spirit of free and objective enquiry, to install into the minds of young learners a sense of purpose and to help them to develop a balanced and integrated personality.

The postgraduate courses train for careers in research and development. The research programmes of the Institute cover a wide span from applied industrial problems to those of a fundamental nature. Special emphasis is laid on inter-disciplinary programmes.

The method of instruction aims at developing the student’s initiative and ability to deal with new situation with confidence and judgment. The programme of instruction is not simply burdened with formal lectures. There is an even load of industrial training and fieldwork and adequate provision for seminars, tutorials, and guided studies to promote and habit of independent thinking.

The examination system, based on the principle that all terminal scores should count towards the final assessment, is in line with the integrated content of the curriculum. It tests the student’s systematic progress and total ability rather than his chance achievements in a single examination.

Department of Chemistry

The Department of Chemistry started its academic program right from the inception

of the Institute in 1952 pioneered in chemistry education and research in the country during the last 54 years. The department offers (i) a five-year M. Sc. degree in Industrial Chemistry, (ii) a two-year M. Sc degree in chemistry and (iii) Ph. D. in Chemistry. Till now the department has produced more than 200 Ph.D. students. Different research and development projects are sponsored by, MHRD,CSIR, DST, DBT, BRNS, GAIL, INSA, ARDB, Bayer (Germany), Glaxo (UK), DuPoint (USA) and Johns Hopkins University (USA).

The department is equipped with a number of sophisticated analytical instruments for chemical research in frontier areas and students are trained to utilize them during their studies and research. The 2-year M.Sc. course in Chemistry is very popular and students from reputed colleges all over the country join this program every year. The course do not offer any special paper but provide one year long project work with a faculty member of the Department and about 3-month summer training in reputed Industry / Institute in India. The alumni of the department are well placed in industry and academic institute. The excellent chemical research by the faculty members and the students of the department brought recognitions and distinctions. The department publishes on an average 150 research / review articles in different national and International journals.

Department of Geology and Geophysics

The Department of Geology and Geophysics offers two-years M.Sc. courses in (i) Geological Sciences and (ii) Geophysics. The aim of these two courses is to groom students to enter upon careers in the field and in the laboratory. Over the years a large number of graduates of this department have come to occupy important positions in professional organizations like the ONGC, GSI, AMD, etc., in several universities and research organizations both in India and abroad. The department counts among its alumni six Bhatnagar laureates, three each in Geology and Geophysics, two Vice-Chancellors, one Director General of GSI, Directors of AMD and ONGC. Students will have the opportunity to participate in activities of the Earth Science Study Circle, which promotes both curricular and extra-curricular activities.

The department is actively engaged in research wok in the field of structural geology, Precambrian geology, igneous and metamorphic petrology, economic geology, geochemistry, environmental earth science, sedimentary geology, photo-geology and remote-sensing, stratigraphy, biostratigraphy, micropaleontology, paleomonsoon analysis, isotope geology and geochronology, ground water geology and geophysics, gravity magnetics, magnetotelluries, deep crystal studies, electrical and electromagnetics, seismic reflections and refractions, numerical modeling and inversion of geophysical data, seismic and electrical tomography, seismic and electromagnetic wave propagation, well-logging, earthquake and engineering seismology, radionuclide pollution and modeling, etc.

The department is going to be included in the global seismological network with the setting-up of a broadband seismological observatory. The department runs a collaborative research and training programme with DAAD, Germany.

The department has contributed textbooks to the national and international earth science community.

Department of Physics

The Department of Physics and Meteorology started its academic program right from the inception of IIT Kharagpur. The distinctive character of this department has made it especially conductive to postgraduate studies and research. There are twenty-six

members in the faculty, as well as scientific officers, research associates and about twenty-five students pursuing a Ph.D. The department offers a (i) 5-year integrated M. Sc. in Physics, (ii) 2-year M. Sc. in Physics, (iii) 2-year M. Tech in Solid State Technology, and (iv) Ph.D. in Physics. In the 2-year M. Sc course, the students are offered basic courses on classical mechanics, quantum and statistical mechanics, electro-magnetism, mathematical methods, computational methods, optics, nuclear and particle physics, condensed matter physics, atomic and molecular spectroscopy and electronics. Besides the basic courses, electives in many different branches of physics, for example astrophysics and cosmology, advanced condensed matter, high-energy physics, optics, photonics, semiconductor physics, surface physics, quantum field theory: designate to bring the student up-to-date with the current status of those areas are also offered.

In the second year of this M.Sc. course the students are required to undertake a year long project (either theoretical or experimental), which involves investigative work leading to a dissertation. Also, in the final year, the students are trained to use various experimental equipments like the spectro-photometer, the diffracto-meter, the Gamma ray spectrometer and the impedance analyzer. It is observed that such training helps the students to acquire a placement in R and D sector of the industry afterward. The department has excellent infrastructural support including modern computers and modern instruments in the student laboratories. Good research facilities are available in the department as well as in other departments (when the need for inter-departmental collaboration arises). The faculty of the department is actively engaged on a broad range of research activities, almost evenly distributed between experimental and theoretical work. The major areas on which the department has been and would be concentration its research activities are Atmospheric Sciences, Astrophysics and Cosmology, Biophysics and Complex Systems, Chaos and Non-Linear dynamics, Condensed Matter Physics, High-energy and particle physics, Fiber, Quantum and Non-Linear Optics, turbulence etc. There exist very good intra and interdepartmental interaction leading to a healthy research environment. The department runs a number of theoretical and experimental projects in different branches of physics funded by various national agencies, under the supervision of different members of the faculty.

The department organizes various conferences and workshops and enjoys periodic visits by the experts from India and abroad. It also benefits from the inter-institutional MOU that IIT Kharagpur has with IUCAA and PAC through its activities in the areas of Astrophysics and Cosmology. Besides these the students are up-dated on recent developments in various fields of physics through regular seminars and group discussions. Lastly, the social activities arranged by the Physics society bring the students and staff members in close and informal contact to create an atmosphere of interactive research and free exchange of knowledge.

Department of Mathematics

The Department of Mathematics since its inception is actively engaged in excellent teaching and research in several areas of mathematical sciences. The excellence has been recognized by several prestigious awards received by the faculty, alumni and students.

The department has its own library with a large number of text books and Computer Labs with several powerful workstations, servers and several Pentiums with multimedia options. All these systems are connected to the Institute LAN.

The department offers two five-year integrated M. Sc. course namely,(i) Mathematics

and Computing (ii) Statistics and Informatics , where the admission is through IIT JEE.
The department also offers two 2-Year M.Sc course namely, (i) Mathematics (ii) Statistics and Informatics where the admission is through JAM with the purpose to prepare the students with in-depth knowledge of various branches of Mathematics / Statistics together with applications using modern computational tools. An M.Tech. course in computer science and data processing is also offered by the department where the admission is through GATE with the provision of some seats for sponsored candidates. After completion of the M.Sc / M.Tech many students join in the IT industry and some of them go to abroad for their M.S and Ph. D and some students join in the Ph. D program in the same Department as well as in other Institute / University.

Fees and Payment*:
(a) Tuition and other nonrefundable fee: Rs.7400/-
(b) Refundable caution money: Rs. 4000/-

* Tentative and subject to change

INDIAN INSTITUTE OF TECHNOLOGY MADRAS

The Indian Institute of Technology Madras belongs to the genre of new generation Institutes of national importance in higher education in the field of Technology and Science. The Institute has grown from strength to strength ever since it obtained its charter from the Parliament of India in 1961 and has established itself as a premier center of research, consultancy and technological/scientific development. It all began in the year 1956 when Pandit Jawaharlal Nehru, then Prime Minister of India, was on an official visit to West Germany and was offered assistance by the Government of the Federal Republic of Germany, to set up a higher technological institute in India. This resulted in the signing of the first Indo-German Agreement in Bonn in 1958, for the establishment of an Indian Institute of Technology Madras, with assistance from Germany in terms of faculty, technical staff and equipment.

The Institute has several departments, which offer undergraduate and post-graduate courses in various disciplines of engineering and pure sciences. The Central Library and Computer Center of the Institute are well equipped to fulfill the needs of the faculty and students. There are many advanced research centers in the Institute having excellent facilities for carrying out research in frontier areas of science and technology. The Institute has about 350 faculty, 4000 students and 900 administrative and support staff.

The Institute with a self contained beautiful campus spanning 630 acres is located in South Chennai, on Sardar Patel Road at a distance of about 3 kilo meters from the Bay of Bengal. It is flanked by Adyar, Taramani and Velachery Villages. It is at a distance of about 14 kilometers from the Central Railway Station and is well connected with buses to the city.

The campus is residential, with 17 student hostels (Two hostels exclusively for girl students) and quarters for the families of faculty and staff. The general facilities for the residents of the campus include two schools (one Kendriya Vidyalaya and another with IIT Management), Banks (SBI, Canara Bank and ICICI Bank), Post Office, Shopping Complex, Hospital, and an Open Air Theatre where movies are screened every Saturday evening. The campus houses a natural forest, which is a haven for spotted deer and black buck. Several student amenities such as Swimming Pool, Gymnasium, Canteens and Play grounds are available. Apart from buses, electrically powered vans also ply within the campus.

Master of Science Programmes

Indian Institute of Technology Madras offers two-year M.Sc. programmes in Chemistry, Mathematics and Physics. The M.Sc. programme has a credit based curriculum. Besides a common core programme, students have opportunity to register for a number of elective courses to match their interests. The evaluation is based on continuous assessment through quizzes, assignments and tests.

Fees and Payment*:

(a) Tuition and Admission fee Rs.7,900/-

(b) Refundable Deposit Rs.2,000/-
(c) Hostel fee (including advance dining charges of Rs.8,000/- and medical insurance premium of Rs.468/-) per semester Rs.12,918/-

* Tentative and subject to change

Tuition fee of Rs.3,000/- per semester is exempted for SC/ST students

Scholarships:

Merit scholarship: On the basis of the performance at the end of the 1st semester, 25% of the students admitted or 25% of the sanctioned strength whichever is less will be awarded merit scholarship for the first two semesters of the programme and renewal for III and IV semesters will be based on the performance in the II and III semesters, at the rate approved by the GoI from time to time. These students are exempted from payment of tuition fees.

Freeship: In addition, 10% of the students admitted or 10% of the sanctioned strength whichever is less are exempted from payment of tuition fees for the first two semesters of the programme and renewal will be based on the performance in the II and III semesters.

50% freeship: Out of the remaining students who may secure not less than 6.5% CGPA and whose parental income is less than Rs.2 lakhs per annum will be awarded 50% tuition fee waiver.

Department of Chemistry

The Department of Chemistry has 31 faculty with specialization in diverse fields of chemistry to fulfill the needs of students who are expected to compete at the International level. There are 18 technical and supporting staff members.

The department has about 124 students enrolled in the Ph.D. programme and 60 in the M.Sc. programme.

The common core courses in the M.Sc. programme are offered in the first three semesters. In the fourth semester, the students have the option to choose 4 elective courses of highly specialized subjects. The core courses are carefully planned to cover the basic and advanced concepts of all the branches of chemistry with exposure to the latest developments in the field of chemistry.

In the first three semesters the M.Sc. students have laboratory courses in Organic, Inorganic and Physical Chemistry. The practicals are aimed to train the students for working in any advanced laboratory with modern facilities and sophisticated instruments. The department offers a unique computational chemistry programme, which makes the students familiar with applications of software related to chemistry.

In second year, a seminar is mandatory for all M.Sc. students. Under the supervision of a faculty member, students are trained to search the ocean of chemistry literature using Scifinder, a software provided by American Chemical Society. Our central library has vast and valuable collection of text books and journals. In the second year, the students will do research in the area of their choice under the supervision of one of the faculty members. The project, which is expected to be an original piece of research, will prepare the students to take-up Ph.D. programme or jobs in established national and multinational laboratories.

The Department has excellent instrumentation facilities like FTIR, U.V-Vis, Electrospray-ionization mass spectrometer, MALDI Mass Spectrometer, N.M.R.

Single crystal XRD and a CHN analyzer. With the funding of MHRD and DST, more sophisticated equipments are being added to make the department one of the best in the country and comparable to top ranking universities abroad.

Department of Mathematics

The Department of Mathematics is engaged in teaching and research in many areas of Pure, Applied and Computational Mathematics. The department offers M.Sc. (two-year programme) and Ph.D. Degree programmes in Mathematics, and a two-year M.Tech Degree programme in Industrial Mathematics and Scientific Computing. The out going students of the department are recruited by leading industries through the Institute Placement Office. They hold high positions in reputed Institutes, Universities and Companies around the globe.

The core courses for the M.Sc. programme are offered in the first three semesters. These courses include subjects such as Algebra, Discrete Mathematics, Linear Algebra, Ordinary and Partial Differential Equations, Calculus of Variations, Mechanics, Continuum Mechanics, Real Analysis, Complex Analysis, Functional Analysis, Topology, Measure and Integration, Probability Theory, Principles of Computing and Numerical Analysis. In the final semester the students can choose electives from a rich menu of subject as such as Computational Fluid Dynamics, Combinatorial Optimization, Fuzzy Sets, Operator Theory, Graph Theory, Stochastic Processes and Operations Research. The students will also do a project, which will introduce them to advanced topics and research methodologies. Seminar and via-voce are also part of the programme.

The department has twenty five faculty members. In addition to teaching and research, they are actively engaged in continuing education and consultancy. Many of them coordinate important projects funded by national agencies/organizations like CSIR, DST, ISRO, DRDO, DAE and NBHM. Their research areas include Real and Complex Analysis, Functional Analysis, Operator Theory, Harmonic Analysis and Wavelet Theory, Applied Algebra, Commutative Algebra, Algebraic Geometry, Algebraic Topology, Numerical Analysis, Computational Fluid Dynamics, Optimization Theory, Differential equations, Inverse and Ill-Posed Problems, Mathematical Physics, Fluid Mechanics, Applied Probability and Stochastic Processes, Graph Theory, Mathematical Logic and Theoretical Computer Science.

The department is well-equipped with two computer laboratories meant for research scholars and master's students. Each laboratory has about 30 systems, high end servers and workstations. All the machines are connected under the Institute network system. The department has a separate library to cater to the needs of our students and faculty.

The department conducts weekly seminars and invited lectures addressed by visiting mathematicians and faculties from IIT and other Institutes. The department arranges two annual events, namely, the National symposium on Mathematical Methods and Applications held on 22nd December commemorating the Indian Mathematical genius Srinivasa Ramanujan and FORAYS – a mathfest conducted by students. The faculty members organize National/International Conferences /Workshops periodically.

Department of Physics

The Department of Physics currently has 33 faculty members and 30 technical and supporting staff members. It offers B.Tech (Engineering Physics), M.Sc. (two-year

programme) and Ph.D. degree in Physics and a M.Tech. (two-year programme) in Solid State Technology.

The core courses offered in the department include Classical Mechanics, Mathematical Physics, Statistical Physics, Quantum Mechanics, Electromagnetic Theory, Condensed Matter Physics, Electronics, Atomic and Molecular Physics. Elective courses are offered in the areas such as Solid State Physics, Lasers, Modern Optics, Digital Electronics, Cryogenics, Physics of Nanomaterials and Theoretical Physics. The students will also do a project, which will introduce them to advanced measuring techniques and research methodologies in physics. A seminar and short courses on machine shop practice and technical drawing, are additional requirements of the M.Sc. programme.

The research and development activities of the department encompass different areas of condensed matter physics, lasers, photonics and theoretical physics. Some of these areas are: Low Temperature Physics, Superconductivity, Thin Films, Microwave Materials, Magnetic Materials and Magnetic Resonance, Ultrafast Phenomena, Holography, Imaging and Photonic Materials, Photonics and Laser Physics, Semiconductor, Transport and Dielectric Properties of materials, Solid State Ionics, Physics and Preparation of Nanomaterials, Atomic and Molecular Physics, Nonlinear Dynamics and Chaos, Classical and Quantum Field Theory, Quantum Computing and Quantum Information Theory, String Theory, Laser Cooling and Trapping of Atoms, Saturation Absorption Spectroscopy etc.

The department is equipped with several major facilities in its laboratories. These include nitrogen liquefiers, thin-film coating units, ESR and NMR spectrometer, He-Ne lasers, argon ion laser, excimer laser, ruby laser, ND-Yag laser, X-ray diffractometer UV-Visible Raman Spectroscope, TGA and DSC impedance spectroscopy etc. and a modern applied optics laboratory. In addition, the department has two workstations and several PCs to adequately meet the computational needs of students. The mainframe computer system on campus can also be accessed by the faculty and students of the department.

INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Indian Institute of Technology Roorkee is an institute with long and illustrious history. Its eventful journey began in 1847 as Roorkee College, the first Engineering College in British Empire which was later renamed as Thomason College of Civil Engineering in 1854 and again as Thomason College of Engineering in 1945, when other engineering disciplines were introduced. On November 25, 1949 it became University of Roorkee, the first Engineering University of Independent India and finally an IIT on September 21, 2001 by an Act of Parliament.

The Institute has 18 academic departments, supported by 6 academic and service centers (like Institute Computer Center, Information Superhighway Center, Instrumentation Center etc.), offering 15 undergraduate courses in engineering and architecture, 3 dual degree courses and 52 postgraduate courses in engineering, architecture, sciences, computer applications and business administration, besides research programmes at doctoral and post-doctoral levels in cutting-edge technology and sciences. One of the academic departments namely the department of Pulp and Paper Engineering is located at the Saharanpur Campus (approximately 50 km from Roorkee) because of proximity with Paper Industries in Sharanpur.

The IIT Roorkee has a highly qualified and motivated faculty of about 350 members who are engaged in research and consultancy in addition to teaching. The faculty members offer their expertise through consultancy services to private/public sector industries as well as to government agencies. The institute has about 2000 undergraduate students, 1400 postgraduates and nearly 750 research scholars.

There are a number of academic and research centers engaged in interdisciplinary research, and collaborative programmes exist with many institutions in India and abroad. Several central facilities such as Central Library having more than 3,00,000 volumes of books and periodicals, Information Superhighway Center with Internet connectivity, a modern Computer Center and Institute Instrumentation Center with highly sophisticated analytical instruments exist on the campus.

The Institute prepares students to meet ever-increasing technological and social challenges with its traditions of self-discipline, hard work, all-round personality development and innovative approach to problems.

The IIT Roorkee is a fully residential Institute, with well-designed hostels (Bhawans) for both boys and girls, sprawling sports ground, a modern swimming pool, boat club and a host of students clubs with facilities for different games including Tennis, Squash and Billiards. Societies and Associations for activities like NCC,Rangering and Rovering, Mountaineering and Trekking provide excellent opportunities to the students for their self-development.

Roorkee Town

Roorkee, a quiet town of moderate size in the district of Hardwar (Uttaranchal), is located on the banks of the Upper Ganga Canal, which takes off at Hardwar. It is about 30 km south of the Shivalik range of the mighty Himalayas, about 170 km to

the north of Delhi and is situated on Amritsar-Howrah main railway line. Roorkee is linked by rail to many important mega cities such as Delhi, Kolkata and Mumbai. Roorkee is also well connected by road being located on the Delhi-Hardwar National Highway (NH 58), and on the Roorkee-Panchkula Highway (NH 73). The Roorkee town (Latitude 29.0^0 52' N and Longitude 77.0^0 53' 52" E) is 268 m above mean sea level and has a cold winter. The summer months, though hot, are moderated by the proximity of the Shivalik. The rainy season is mainly between July and September with an average rainfall of 1050 mm.

Apart from the Institute, which is situated in a 150-hectare campus, Roorkee town is an important center of engineering activity. It has the Central Building Research Institute, the National Institute of Hydrology, the Irrigation Research Institute, the Irrigation Design Organization and the headquarters of Bengal Engineering Group and Center along with an important Army base.

The Institute campus is 2.5 Km from the Roorkee Railway Station and is only 200 m from the Roadways Bus Station.

Department of Biotechnology

The Department of Biotechnology, established in 1981, offers a 2 years M.Sc. Biotechnology programme (sponsored by Department of Biotechnology, Government of India) and Ph. D. programme. B.Tech. (Biotechnology) programme has been initiated from the 2005-06 session with an intake of 30 students. Research is carried out in identified thrust areas in the field of Molecular Biophysics, Genetics, Microbiology, Animal and Plant Physiology, Biochemistry and Molecular Biology. Several sponsored research projects have been undertaken in the specialized areas of protein – DNA interaction, 3D Molecular Modelling, Genetic Engineering of Nitrogen Fixation, Mechanisms of Male Fertility Control, Microbial Biosynthesis of Organic Acids and Industrially Significant Enzymes, Cellulose Degradation, Plasma Membranes based Enzymes and Cell Surface Antigens. Research collaboration has been initiated/exists with institutions such as Tata Institute of Fundamental Research (TIFR) Bombay, Institute of Genomics and Integrative Biology Delhi, Central Drug Research Institute, Lucknow, National Environmental Engineering Research Institute, International Center for Genetic Engineering and Biotechnology (ICGEB), and Ranbaxy Laboratories Ltd., Gurgaon.

Department of Chemistry

The department of chemistry was established in the year 1960 and now nation's one of the fast-growing departments with 22 faculty members working in the frontiers of chemical research. Total number of seats in M.Sc. is 16. The department offers specialization in organic, inorganic, physical and analytical chemistry. In the fourth semester each M.Sc. (final year) student is required to carry out a project work under the supervision of a faculty member and submit a dissertation along with a seminar presentation. The department is well equipped with good instrumental facilities like HPLC, gas chromatography, GC-Mass, AAS, elemental-analyzer, IR, cyclic voltameter etc. The students make use of several sophisticated facilities at the Institute's I.I.C. (Institute Instrumentation Center); these include the NMR(500MHz), single crystal X-ray diffractometer, electron probe micro analyzer, magnetometer, Mossbauer spectrometer, scanning electron microscope and TEM, SQUID magnetometer, fluorescence spectrophotometer etc. There are placement opportunities for the M.Sc. (Chemistry) students through the Institute placement office.

Department of Earth Sciences

The Department of Earth Sciences, formerly the Department of Geology and Geophysics, was established in 1960. During the span of last more than four decades, the Department has become one of the foremost centers of research, postgraduate training and consultancy in the field of Earth Sciences. The Department has been recipient of financial aid under the prestigious Special Assistance and COSIST programmes of UGC (Ministry of HRD, Govt. of India). The geological studies at the Institute date back to the middle of the nineteenth century when Colonel Sir Proby Cautley (who was responsible for establishing the Thomason Engineering College) was elected as a Fellow of the Royal Society, London, for his pioneering work on the vertebrate fossils of the Shiwalik Ranges. Later Henry Benedict Medlicott, who was also admitted as the Fellow of the Royal Society in 1877, occupied the Chair in Geology and Experimental Sciences at Thomason College. Presently the Department runs two courses viz. M. Sc. in Applied Geology of two-year duration and M. Tech. in Applied Geophysics of three-year duration. Research work leading to Ph.D. degree in several interdisciplinary areas and consultancy programmes constitute an integral part of the Departmental activities. The faculty is engaged in a number of research projects sponsored by the Government of India agencies like CSIR, DST, ONGC, AICTE etc, and the consultancy projects sponsored by various industries, and government agencies. The Department has Hamrock Society, in which all faculty and students are members.

Department of Mathematics

The Department of Mathematics attained its present status of an independent department in 1960. Growing steadily, today the department not only teaches various courses in Mathematics to undergraduate and postgraduate students of different engineering and science departments, but is also running its own M. Sc. courses in Applied Mathematics and Industrial Mathematics and Informatics. From the year July, 2007, the department is going to start a 5-year integrated M.Sc. programme in Mathematics.

The department also coordinates an interdisciplinary MCA Course. Five batches of MCA have passed out and they have been well placed in the Industry. The students have got jobs in the companies like Microsoft Corporation, TCS, Infosys, Wipro, Oracle India Ltd, IBM India Ltd, Cognizant, CSC Ltd. etc. Besides the central computing facilities of the Institute, the department has its own state of the art Computational Laboratory with 50 PCs with internet connection. The department has a very well stocked library which is self sufficient in providing text books to M.Sc. and M.C.A. students.

The department offers facilities for research work leading to Ph. D. in various fields of Pure and Applied Mathematics. The department has a mathematical modelling laboratory and a PC based system analyzer and a PC based sound analyzer. Department has research collaborations with different national and international organizations. The department has a partnership programme with the universities of Kaiserslautern, Addis Abbaba, Bandung and Colombo for training the students in Industrial Mathematics. The Department of Mathematics offers consultancies in mathematical modeling and solution of various industrial and real life problems. The faculty also joins different industrial research and consultancy teams to mutually solve problems of higher mathematical contents.

Department of Physics

From a modest beginning in 1960, the department has now grown into an active center of quality teaching and research. Today it stands as one of the leading departments in the country, well known for its high quality teaching and research. The programs have special features, which are present only in a few institutions. Besides teaching the undergraduate engineering students, the faculty of the department provides active leadership in training the postgraduate students. The department offers M. Sc., and M. Tech. (Solid State Electronic Materials) degree. Research facilities leading to Ph.D. degree are available in all major branches of Physics. The faculty of Physics department has been actively pursuing research in important areas like High-TC superconductivity, heavy fermions, transport in atmospheric fluids, magneto-optical properties of transition metal compounds, conducting polymers and device applications, smart electro ceramics and biomaterials, nano-physics, scattering of spin-polarized electrons with atoms and molecules, physics of super-deformed nuclei, high energy nuclear physics, Quark-Gluon Plasma Theory, Gauge Field Theories, String Theory, Lightning Auroral and airglow studies. The experimental and theoretical research activities in the department are recognized by CSIR, AICTE, DST and ISRO etc. and a number of research projects funded by these agencies are in progress. The achievements in research have been well recognized by U.G.C. in selecting this department under Special Assistance Program in 1979 in the thrust areas of Condensed Matter Physics, and Atomic and Molecular Collision Physics. The program was further extended in 1985 and 1992. The U.P. Council of Science and Technology has also selected the department as a Center of Excellence in Physics.

As a member of the Theoretical Physics Seminar Circuit Program (TPSC) the department is able to invite a large number of eminent scientists from other institutions in India.

Institute Scholarships

The Institute offers a certain number of merit-cum-means scholarships to the deserving students in M.Sc. courses on merit, based on the student's cumulative performance as reflected in CGPA and their economic status. One scholarship in M.Sc. final year is awarded for the best performance in the previous year, in Mathematics, Physics and Chemistry departments by rotation. Some trust scholarships and tuition free-ships are also available.

In M.Sc. Biotechnology a scholarship of Rs. 800/- per month is available for meritorious students.

All SC/ST category students whose parents/guardians income is less than Rs.2.0 lakh per annum and wish to avail the facility of scholarship of Rs.1000/- or free messing are required to give their options and submit their parents/guardians income certificate in the prescribed proforma obtainable from the Academic Section.

Only one scholarship/ assistantship is admissible to a student at a time.

Institute Fees* to be Deposited for Admission

Sl. No.	**Fees**	**M.Sc./M.Tech. (Sciences)**	**MCA**
1.	Semester fees: a)Tuition fees** b)Other fees c) Hostel fees	 Rs. 3,000/- Rs. 1,810/- Rs. 1,100/-	 Rs.10,000/- Rs. 1,810/- Rs. 1,100/-

2.	One Time fees	Rs.1,590/-	Rs.1,590/-
3.	Yearly fees for GIS, Bhawan fund	Rs.380/-	Rs.380/-
4.	Refundable deposits	Rs. 3000/-	Rs. 3000/-
Total		**Rs. 10,880**	**Rs. 17,880/-**

* Tentative and subject to change
** Not chargeable from SC/ST students.

18. SYLLABI FOR TEST PAPERS OF JAM 2007

18.1. SYLLABUS FOR BIOTECHNOLOGY (BT) TEST PAPER

The Biotechnology (BT) test paper comprises of Biology (44% weightage), Chemistry (20% weightage), Mathematics (18% weightage) and Physics (18% weightage).

BIOLOGY (10+2+3 level)

General Biology: Taxonomy; Heredity; Genetic variation; Conservation; Principles of ecology; Evolution; Techniques in modern biology.

Biochemistry and Physiology: Carbohydrates; Proteins; Lipids; Nucleic acids; Enzymes; Vitamins; Hormones; Metabolism; Photosynthesis. Nitrogen Fixation, Fertilization and Osmoregulation; Nervous system; Endocrine system; Vascular system; Immune system; Digestive system, Reproductive System.

Basic Biotechnology: Tissue culture; Application of enzymes; Antigen-antibody interaction; Antibody production; Diagnostic aids.

Molecular Biology: DNA; RNA; Replication; Transcription; Translation; Proteins; Lipids; Membranes; Gene transfer.

Cell Biology: Cell cycle; Cytoskeletal elements; Mitochondria; Endoplasmic reticulum; chloroplast; Golgi apparatus; Signaling.

Microbiology: Isolation; Cultivation; Characterization and enumeration of virus; Bacteria; Fungi; Protozoa; Pathogenic micro-organisms.

CHEMISTRY (10+2+3 level)

Atomic Structure: Bohr's theory and Schrodinger wave equation; Periodicity in properties; Chemical bonding; Properties of s, p, d and block elements; Complex formation; Coordination compounds; Chemical equilibria; Chemical thermodynamics (first and second law); Chemical kinetics (zero, first, second and third order reactions); Photochemistry; Electrochemistry; Acid-base concepts; Stereochemistry of carbon compounds; Inductive, Electromeric, conjugative effects and resonance;

Chemistry of Functional Groups: hydrocarbons, alkyl halides, alcohols, aldehydes, ketones, carboxylic acids, amines and their derivatives; Aromatic hydrocarbons, halides, nitro and amino compounds, phenols, diazonium salts, carboxylic and sulphonic acids; Mechanism of organic reaction; Soaps and detergents; Synthetic polymers; Biomolecules - aminoacids, proteins, nucleic acids, lipids and carbohydrates (polysaccharides); Instrumental techniques-chromatography (TLC, HPLC), electrophoresis, UV-Vis-IR and NMR spectroscopy, mass spectrometry, etc.

MATHEMATICS (10+2 level)

Sets, Relations and Functions, Mathematical Induction, Logarithms, Complex numbers, Linear and Quadratic equations, Sequences and Series, Trignometry, Cartesian System of Rectangular Coordinates, Straight lines and Family of Circles, Conic Sections, Permutations and Combinations, Binomial Theorem, Exponential and Logarithmic Series, Mathematical Logic, Statistics, Three Dimensional Geometry, Vectors, Stocks, Shares and Debentures, Average and Partition Values, Index numbers, Matrices and Determinants, Boolean Algebra, Probability, Functions, limits and Continuity, Differentiation, Application of Derivatives, Definite and Indefinite Integrals, Differential Equations, Elementary Statics and Dynamics, Partnership, Bill of Exchange, Linear Programming, Annuities, Application of Calculus in Commerce and Economics.

PHYSICS (10+2 level)
Physical World and Measurement, Kinematics, Laws of Motion, Work, Energy and Power Electrostatics, Current electricity, Magnetic Effects of Current and Magnetism, Electromagnetic Induction and Alternating Current, Electromagnetics waves, Optics, Dual Nature of Matter and Radiations, Atomic Nucleus, Solids and Semiconductor Devices, Principles of Communication, Motion of System of Particles and Rigid Body, Gravitation, Mechanics of Solids and Fluids, Heat and Thermodynamics, Oscillations, Waves.

18.2. SYLLABUS FOR CHEMISTRY (CH) TEST PAPER

PHYSICAL CHEMISTRY
Basic Mathematical Concepts: Differential equations, vectors and matrices.
Atomic Structure: Fundamental particles. Bohr's theory of hydrogen atom; Wave-particle duality; Uncertainty principles; Schrodinger's wave equation; Quantum numbers, shapes of orbitals; Hund's rule and Pauli's exclusion principle.
Theory of Gases: Kinetic theory of gases. Maxwell-Boltzmann distribution law; Equipartition of energy.
Chemical Thermodynamics: Reversible and irreversible processes; First law and its application to ideal and nonideal gases; Thermochemistry ; Second law; Entropy and free energy, Criteria for spontaneity.
Chemical and Phase Equilibria: Law of mass action; K_p , K_c,K_x and K_n ; Effect of temperature on K; Ionic equilibria in solutions; pH and buffer solutions; Hydrolysis; Solubility product; Phase equilibria–Phase rule and its application to one-component and two-component systems; Colligative properties.
Electrochemistry: Conductance and its applications; Transport number; Galvanic cells; EMF and Free energy; Concentration cells with and without transport; Polarography.
Chemical Kinetics: Reactions of various order, Arrhenius equation, Collision theory; Theory of absolute reaction rate; Chain reactions – Normal and branched chain reactions; Enzyme kinetics; Photophysical and photochemical processes; Catalysis.

ORGANIC CHEMISTRY
Basic Concepts in Organic Chemistry and Stereochemistry: Isomerism and nomenclature, electronic (resonance and inductive) effects. Optical isomerism in compounds containing one and two asymmetric centers, designation of absolute configuration, conformations of cyclohexanes.
Aromaticity and Huckel's rule: Mono and bicyclic aromatic hydrocarbons.
Organic Reaction Mechanism and Synthetic Applications: Methods of preparation and reactions of alkanes, alkenes, alkynes, arenes and their simple functional derivatives. Mechanism and synthetic applications of electrophilic aromatic substitution. Stereochemistry and mechanism of aliphatic nucleophilic substitution and elimination reactions. Mechanism of aldol condensation, Claisen condensation, esterification and ester hydrolysis, Cannizzaro reaction, benzoin condensation. Perkin reaction, Claisen rearrangement, Beckmann rearrangement and Wagner-Meerwein rearrangement. Synthesis of simple molecules using standard reactions of organic chemistry. Grignard reagents, acetoacetic and malonic ester chemistry.
Natural Products Chemistry: Introduction to the following classes of compounds-alkaloids, terpenes, carbohydrates, amino acids, peptides and nuclei acids.

Heterocyclic Chemistry: Monocyclic compounds with one hetero atom.
Qualitative Organic Analysis: Functional group interconversions, structural problems using chemical reactions, identification of functional groups by chemical tests.

INORGANIC CHEMISTRY
Periodic Table: Periodic classification of elements and periodicity in properties; general methods of isolation and purification of elements.
Chemical Bonding and Shapes of Compounds: Types of bonding; VSEPR theory and shapes of molecules; hybridization; dipole moment; ionic solids; structure of NaCl, CsCl, diamond and graphite; lattice energy.
Main Group Elements (s and p blocks): Chemistry with emphasis on group relationship and gradation in properties; structure of electron deficient compounds of main group elements and application of main group elements.
Transition Metals (d block): Characteristics of 3d elements; oxide, hydroxide and salts of first row metals; coordination complexes; VB and Crystal Field theoretical approaches for structure, colour and magnetic properties of metal complexes.
Analytical Chemistry: Principles of qualitative and quantitative analysis; acid-base, oxidation-reduction and precipitation reactions; use of indicators; use of organic reagents in inorganic analysis; radioactivity; nuclear reactions; applications of isotopes.

18.3. SYLLABUS FOR COMPUTER APPLICATIONS (CA) TEST PAPER

The Computer Applications (CA) test paper comprises of Mathematics, Computer awareness and Analytical ability and General awareness and they will be in the ration 4:2:1.

MATHEMATICS
Algebra: Set theory and its simple applications. Basic concepts of groups, fields and vector spaces.
Matrices: Rank of a matrix. Existence and uniqueness of solution of a system of linear equation. Eigenvalues and Eigenvectors. Inverse of a matrix by elementary transformations.
Differential Calculus: Differentiation, Partial differentiation, Taylor series and approximate calculations. Maxima and minima of functions of one and two variables.
Integral Calculus: Single and multiple integration. Definite integrals, Change of order and change of variables. Application to evaluation of area, surface and volume.
Differential Equations: First order differential equations, linear differential equations of higher order with constant coefficients.
Vector Analysis: Vector algebra, Gradient.
Numerical Analysis: Solution of non linear equations using iterative methods. Interpolation (Lagrange's formula and Newton's formulae for equidistant points). Numerical differentiation and integration (Trapezoidal and Simpson's rules).
Probability: Basic concepts of probability theory. Binomial and Poisson distributions.
Linear Programming: Formulation and its graphical solution for two variable problems.

COMPUTER AWARENESS
Elements of computers. Number systems. Basic electronic gates. Boolean algebra.

Flip-Flops. Algorithmic approach to solve problems. Fundamentals of C language.

ANALYTICAL ABILITY AND GENERAL AWARENESS
Simple questions will be asked to test the analytical ability and general awareness of candidates.

18.4. SYLLABUS FOR GEOLOGY (GG) TEST PAPER

The Planet Earth: Origin of the Solar System and the Earth; Geosphere and the composition of the Earth; Shape and size of the earth; Earth-moon system; Formation of continents and oceans; Dating rocks and age of the Earth; Energy in the earth system; Volcanism and volcanic land forms; Interior of earth; Earthquakes; Earth's magnetism and gravity, Isostasy; Elements of Plate tectonics; Orogenesis.
Geomorphology: Weathering and erosion; Transportation and deposition due to wind, ice, river, sea, and resulting landforms, Structurally controlled landforms.
Structural Geology: Concept of stratum; Contour; Outcrop patterns; Maps and cross sections; Dip and strike; Classification and origin of folds, faults, joints, foliation and lineation, unconformities; shear zones.
Palaeontology: Origin and evolution of life; Fossils; their mode of preservation and utility; Morphological characters and ages of important groups of animals; Brachiopoda, Mollusca, Trilobita, Graptolitoidea, Anthozoa, Echinodermata etc. Gondwana plant fossils; Elementary idea of verterbrate fossils in India.
Stratigraphy: Principles of stratigraphy; Classification, distribution and ages of the stratigraphic formations of India from Archaean to Recent.
Mineralogy: Symmetry and forms in common crystal classes; Physical properties of minerals; Isomorphism and polymorphism, Classification of minerals; Structure of silicates; Mineralogy of common rock-forming minerals; Mode of occurrence of minerals in rocks. Transmitted polarised light microscopy and optical properties of uniaxial and biaxial minerals.
Petrology: Definition and classification of rocks; Igneous rocks- forms of igneous bodies; Crystallization from magma; classification, association and genesis of igneous rocks; Sedimentary rocks - classification, texture and structure; size and shape of sedimentary bodies. Metamorphic rocks - classification, facies, texture and properties.
Economic Geology: Properties of common economic minerals; General processes of formation of mineral deposits; Physical characters; Mode of occurrence and distribution in India both of metallic and non-metallic mineral deposits; Coal and petroleum occurrences in India.
Applied Geology: Ground Water; Mineral exploration, elements of mining and environmental geology; Principles of engineering geology.

18.5. SYLLABUS FOR GEOPHYSICS (GP) TEST PAPER

*There will be **Three sections** in the Geophysics (GP) test paper, namely, Geology, Mathematics and Physics, each with a weightage of 50%. A candidate has to attempt any **Two sections.***
The syllabus for the Geology, Mathematics and Physics Sections of the Geophysics (GP) test paper are given below:

GEOLOGY SECTION

The Planet Earth: Origin of the Solar System and the Earth; Geosphere and the composition of the earth; Shape and size of the Earth; Earth-moon system; Formation of continents and oceans; dating the rocks and age of the Earth; Energy in the earth system; Volcanism and volcanic land forms; Interior of earth; Earthquakes and seismic waves; Earth's magnetism and gravity, Isostasy; Elements of plate tectonics; Orogenesis.

Geomorphology: Weathering and erosion; transportation and deposition due to wind, ice, river, sea, and resulting landforms, Structurally controlled landforms.

Structural Geology: Concept of stratum; Contour; Outcrop patterns; Maps and cross sections; Dip and strike; classification and origin of folds, faults, joints, foliation and lineation, unconformities; shear zones.

Mineralogy: Symmetry and forms in common crystal classes; physical properties of minerals; Isomorphism and polymorphism, Classification of minerals; Structure of silicates; Mineralogy of common rock-forming minerals; Mode of occurrence of minerals in rock.

Stratigraphy: Principles of Stratigraphy, Geological Time Scale, ages of major stratigraphic units of India.

Petrology: Definition and classification of rocks; Igneous rock-forms of igneous bodies; Crystallisation from magma; classification and association of igneous rocks; Principles of Stratigraphy; Sedimentary rocks-classification, texture and structure; Metamorphic rocks-Classification, facies, texture and structure.

Economic Geology: Physical properties of common ore minerals, General processes of formation of mineral deposits; Mode of occurrence of important metallic and non-metallic deposits in India; Coal, petroleum and ground water occurrences in India.

MATHEMATICS SECTION

Sequences, Series and Differential Calculus: Sequences of real numbers, Convergent sequences and series. Mean Value Theorem, Taylor's theorem, Maxima and Minima, functions of several variables.

Integral Calculus: Fundamental theorem of calculus, Integration, Double and Triple integrals, Surface Areas and Volumes.

Differential Equations: Linear and Non-linear ODE, existence and uniqueness (without proof), Linear Differential Equations of second order with constant coefficients.

Vector Calculus: Gradient, Divergence, Curl, Laplacian, Green's, Stokes and Gauss theorems and their Applications.

Linear Algebra: System of Linear Equations, Matrices, Rank, Determinant, Inverse, eigenvalues and eigenvectros. Dimension, Linear transformations.

Real Analysis: Open and closed sets and limit points in **R** and completeness in **R**, Uniform Continuity, Power Series, Uniform Convergence.

Probability: Probability spaces, Conditional Probability, Independence, Bayes Theorem, Univariate and Bivariate Random Variables, Moment Generating and Characteristic Functions, Binomial, Poisson and Normal distributions.

Statistics: Sampling Distributions of Sample Mean and Variance, Exact Sampling Distribution (Normal Population), Simple and Composite hypothesis, Best critical region of a Test, Neyman-Pearson theorem, Likelihood Ratio Testing and its Application to Normal population, comparison of normal populations, large sample

theory of test of hypothesis, approximate test on the parameter of a binomial population, comparison of two binomial populations.

Complex Analysis: Analytic functions, Harmonic functions, Cauchy's theorem, Cauchy's Integral Formula, Taylor and Laurent Expansion, Poles and Residues.

Numerical Analysis: Difference table, symbolic operators, differences of a factorial, representation of a polynomial by factorials, Forward, backward and central difference approximation formulae. Simpson's one-third rule and the error in it, Gauss-Siedel method and method of elimination for numerical solution of a system of linear equations, iteration method and its convergence, Gradient and Newton-Raphson method and their convergence.

PHYSICS SECTION

Mechanics and General Properties of Matter: Newton's laws of motion and applications, Kepler's laws, Gravitational Law and field, Conservative and non-conservative forces. System of particles, Center of mass, equation of motion of the CM, conservation of linear and angular momentum, conservation of energy. Elastic and inelastic collisions. Rigid body motion, fixed axis rotations, rotation and translation, moments of Inertia and products of Inertia. Principal moments and axes. Elasticity, Hooke's law and elastic constants of isotropic solid, stress energy. Kinematics of moving fluids, equation of continuity, Euler's equation, Bernoulli's theorem, viscous fluids, surface tension and surface energy, capillarity.

Oscillations, Waves and Optics: Differential equation for simple harmonic oscillator and its general solution. Superposition of two or more simple harmonic oscillators. Lissajous figures. Damped and forced oscillators, resonance. Wave equation, traveling and standing waves in one-dimension. Energy density and energy transmission in waves. Group velocity and phase velocity. Sound waves in media. Doppler Effect. Fermat's Principle. General theory of image formation. Thick lens, thin lens and lens combinations. Interference of light, optical path retardation. Fraunhofer diffraction. Rayleigh criterion and resolving power. Diffraction gratings. Polarization: linear, circular and elliptic polarization. Double refraction and optical rotation.

Electricity and Magnetism: Coulomb's law, Gauss's law. Concept of Potential, Field and Boundary Conditions, Solution of Laplace's equation for simple cases. Conductors, capacitors, dielectrics, dielectric polarization, volume and surface charges, electrostatic energy. Magnetic susceptibility, Bar magnet, Earth's magnetic field and its elements. Biot-Savart law, Ampere's law, Lenzes law, Faraday's law of electromagnetic induction, Self and mutual inductance. Alternating currents. Simple DC and AC circuits with R, L and C components. Displacement current, Maxwell's equations and plane electromagnetic waves. Lorentz Force and motion of charged particles in electric and magnetic fields.

Kinetic theory, Thermodynamics: Elements of Kinetic theory of gases. Velocity distribution and Equipartition of energy. Specific heat of Mono-, di- and tri-atomic gases. Ideal gas, Van-der-Waals gas and equation of state. Mean free path. Laws of thermodynamics. Zeroeth law and concept of thermal equilibrium. First law of thermodynamics and its consequences. Isothermal and adiabatic processes. Reversible, irreversible and quasi-static processes. Second law of thermodynamics. Carnot cycle.

Modern Physics: Blackbody radiation, photoelectric effect, Bohr's atomic model, X-rays. Wave-particle duality, Uncertainty principle, Pauli exclusion principle, Structure

of atomic nucleus, mass and binding energy. Radioactivity and its applications. Laws of radioactive decay and half life, Fission and fusion

Solid State Physics, Devices and Electronics: Crystal structure, Bravais lattices and basis. Miller indices. X-ray diffraction and Bragg's law, Origin of energy bands. Concept of holes. Intrinsic and extrinsic semiconductors. p-n junctions, transistors. Amplifier circuits with transistors.

18.6. SYLLABUS FOR MATHEMATICAL STATISTICS (MS) TEST PAPER

The Mathematical Statistics (MS) test paper comprises of Mathematics (40% weightage) and Statistics (60% weightage).

MATHEMTICS

Sequences and Series: Convergence of sequences of real numbers, Comparison, root and ratio tests for convergence of series of real numbers.

Differential Calculus: Limits, continuity and differentiability of functions of one and two variables. Rolle's theorem, mean value theorems, Taylor's theorem, indeterminate forms, maxima and minima of functions of one and two variables.

Integral Calculus: Fundamental theorems of integral calculus. Double and triple integrals, applications of definite integrals, arc lengths, areas and volumes.

Matrices: Rank, inverse of a matrix. system of linear equations. Linear transformations, eigenvalues and eigenvectors. Cayley-Hamilton theorem, symmetric, skew-symmetric and orthogonal matrices.

Differential Equations: Ordinary differential equations of the first order of the form y' = f(x,y). Linear differential equations of the second order with constant coefficients.

STATISTICS

Probability: Axiomatic definition of probability and properties, conditional probability, multiplication rule. Theorem of total probability. Bayes's theorem and independence of events.

Random Variables: Probability mass function, probability density function and cumulative distribution functions, distribution of a function of a random variable. Mathematical expectation, moments and moment generating function. Chebyshev's inequality.

Standard Distributions: Binomial, negative binomial, geometric, Poisson, hypergeometric, uniform, exponential, gamma, beta and normal distributions. Poisson and normal approximations of a binomial distribution.

Joint Distributions: Joint, marginal and conditional distributions. Distribution of functions of random variables. Product moments, correlation, simple linear regression. Independence of random variables.

Sampling distributions: Chi-square, t and F distributions, and their properties.

Limit Theorems: Weak law of large numbers. Central limit theorem (i.i.d.with finite variance case only).

Estimation: Unbiasedness, consistency and efficiency of estimators, method of moments and method of maximum likelihood. Sufficiency, factorization theorem. Completeness, Rao-Blackwell and Lehmann-Scheffe theorems, uniformly minimum variance unbiased estimators. Rao-Cramer inequality. Confidence intervals for the parameters of univariate normal, two independent normal, and one parameter exponential distributions.

Testing of Hypotheses: Basic concepts, applications of Neyman-Pearson Lemma

for testing simple and composite hypotheses. Likelihood ratio tests for parameters of univariate normal distribution.

18.7. SYLLABUS FOR MATHEMATICS (MA) TEST PAPER

Sequences, Series and Differential Calculus: Sequences of real numbers. Convergent sequences and series, absolute and conditional convergence. Mean value theorem. Taylor's theorem. Maxima and minima of functions of a single variable. Functions of two and three variables. Partial derivatives, maxima and minima.
Integral Calculus: Integration, Fundamental theorem of calculus. Double and Triple, integrals, Surface areas and volumes.
Differential Equations: Ordinary differential equations of the first order of the form y'=f(x,y). Linear differential equations of second order with constant coefficients. Euler-Cauchy equation. Method of variation of parameters.
Vector Calculus: Gradient, divergence, curl and Laplacian. Green's, Stokes' and Gauss' theorems and their applications.
Algebra: Groups, subgroups and normal subgroups, Lagrange's Theorem for finite groups, group homomorphisms and basic concepts of quotient groups, rings, ideals, quotient rings and fields.
Linear Algebra: Systems of linear equations. Matrices, rank, determinant, inverse. Eigenvalues and eigenvectors. Finite Dimensional Vector Spaces over Real and Complex Numbers, Basis, Dimension, Linear Transformations.
Real Analysis: Open and closed sets, limit points, completeness of R, Uniform Continuity, Uniform convergence, Power series.

18.8. SYLLABUS FOR PHYSICS (PH) TEST PAPER

Mathematical Methods: Calculus of single and multiple variables, partial derivatives, Jacobian, imperfect and perfect differentials, Taylor expansion, Fourier series. Vector algebra, Vector Calculus, Multiple integrals, Divergence theorem, Green’s theorem, Stokes’ theorem. First and linear second order differential equations. Matrices and determinants, Algebra of complex numbers.
Mechanics and General Properties of Matter: Newton’s laws of motion and applications, Velocity and acceleration in Cartesian, polar and cylindrical coordinate systems, uniformly rotating frame, centrifugal and Coriolis forces, Motion under a central force, Kepler’s laws, Gravitational Law and field, Conservative and non-conservative forces. System of particles, Center of mass, equation of motion of the CM, conservation of linear and angular momentum, conservation of energy, variable mass systems. Elastic and inelastic collisions. Rigid body motion, fixed axis rotations, rotation and translation, moments of Inertia and products of Inertia. Principal moments and axes. Elasticity, Hooke’s law and elastic constants of isotropic solid, stress energy. Kinematics of moving fluids, equation of continuity, Euler’s equation, Bernoulli’s theorem, viscous fluids, surface tension and surface energy, capillarity.
Oscillations, Waves and Optics: Differential equation for simple harmonic oscillator and its general solution. Superposition of two or more simple harmonic oscillators. Lissajous figures. Damped and forced oscillators, resonance. Wave equation, traveling and standing waves in one-dimension. Energy density and energy transmission in waves. Group velocity and phase velocity. Sound waves in media.

Doppler Effect. Fermat's Principle. General theory of image formation. Thick lens, thin lens and lens combinations. Interference of light, optical path retardation. Fraunhofer diffraction. Rayleigh criterion and resolving power. Diffraction gratings. Polarization: linear, circular and elliptic polarization. Double refraction and optical rotation.

Electricity and Magnetism: Coulomb's law, Gauss's law. Electric field and potential. Electrostatic boundary conditions, Solution of Laplace's equation for simple cases. Conductors, capacitors, dielectrics, dielectric polarization, volume and surface charges, electrostatic energy. Biot-Savart law, Ampere's law, Faraday's law of electromagnetic induction, Self and mutual inductance. Alternating currents. Simple DC and AC circuits with R, L and C components. Displacement current, Maxwell's equations and plane electromagnetic waves, Poynting's theorem, reflection and refraction at a dielectric interface, transmission and reflection coefficients (normal incidence only). Lorentz Force and motion of charged particles in electric and magnetic fields.

Kinetic theory, Thermodynamics: Elements of Kinetic theory of gases. Velocity distribution and Equipartition of energy. Specific heat of Mono-, di- and tri-atomic gases. Ideal gas, van-der-Waals gas and equation of state. Mean free path. Laws of thermodynamics. Zeroeth law and concept of thermal equilibrium. First law and its consequences. Isothermal and adiabatic processes. Reversible, irreversible and quasi-static processes. Second law and entropy. Carnot cycle. Maxwell's thermodynamic relations and simple applications. Thermodynamic potentials and their applications. Phase transitions and Clausius-Clapeyron equation.

Modern Physics: Inertial frames and Galilean invariance. Postulates of special relativity. Lorentz transformations. Length contraction, time dilation. Relativistic velocity addition theorem, mass energy equivalence. Blackbody radiation, photoelectric effect, Compton effect, Bohr's atomic model, X-rays. Wave-particle duality, Uncertainty principle, Schrödinger equation and its solution for one, two and three dimensional boxes. Reflection and transmission at a step potential, tunneling through a barrier. Pauli exclusion principle. Distinguishable and indistinguishable particles. Max-well-Boltzmann, Fermi-Dirac and Bose-Einstein statistics. Structure of atomic nucleus, mass and binding energy. Radioactivity and its applications. Laws of radioactive decay. Fission and fusion.

Solid State Physics, Devices and Electronics: Crystal structure, Bravais lattices and basis. Miller indices. X-ray diffraction and Bragg's law, Einstein and Debye theory of specific heat. Free electron theory of metals. Fermi energy and density of states. Origin of energy bands. Concept of holes and effective mass. Elementary ideas about dia-, para- and ferromagnetism, Langevin's theory of paramagnetism, Curie's law. Intrinsic and extrinsic semiconductors. Fermi level. p-n junctions, transistors. Transistor circuits in CB, CE, CC modes. Amplifier circuits with transistors. Operational amplifiers. OR, AND, NOR and NAND gates.

Appendix – I
LIST OF CITIES/TOWNS OF JAM TEST CENTRES

Test City/ Town	Code
IIT Bombay Zone	
Ahmedabad	11
Bhopal	12
Indore	13
Mumbai	14
Nagpur	15
Pune	16
IIT Delhi Zone	
Chandigarh	21
Delhi	22
IIT Guwahati Zone	
Bhubaneswar	31
Guwahati	32
Patna	33
Ranchi	34
IIT Kanpur Zone	
Kanpur	41
Lucknow	42
Varanasi	43

Test City/ Town	Code
IIT Kharagpur Zone	
Kharagpur	51
Kolkata	52
Vijayawada	53
Vishakapatnam	54
IIT Madras Zone	
Bangalore	61
Chennai	62
Coimbatore	63
Hyderabad	64
Kochi	65
Thiruvananthapuram	66
Tiruchirapalli	67
IIT Roorkee Zone	
Agra	71
Amritsar	72
Bareilly	73
Jaipur	74
Kurukshetra	75
Nainital	76
Noida	77
Roorkee	78

Appendix – II
AUTHORITIES WHO MAY ISSUE SC/ST/OBC CERTIFICATE

SC/ST/OBC candidates should submit a certificate issued by any of the following authorities **(Certificate issued by any other authority will be rejected)**:
District Magistrate/Additional District Magistrate/Collector/ Deputy Commissioner/ Additional Deputy Commissioner/ Deputy Collector/1st Class Stipendary Magistrate/ City Magistrate/ Sub-Divisional Magistrate/ Taluka Magistrate/ Executive Magistrate/Extra Assistant Commissioner/Chief Presidency Magistrate/Additional Chief Presidency Magistrate/Presidency Magistrate/Revenue Officer not below the rank of Tehsildar/Sub-Divisional Officer of the area where the candidate and/or his/her family normally resides/Administrator/Secretary to Administrator/ Development Officer (Lakshadweep Island).

IMPORTANT NOTE

1. In all matters concerning JAM 2007, the decision of the Organising Institute or the Organising Chairman, JAM 2007 will be final and binding on all the applicants.
2. Although JAM 2007 is held at different centres across country, Indian Institute of Technology Guwahati is the Organising Institute, and has the overall responsibility of conducting JAM 2007. In case of any claims or disputes

arising in respect of JAM 2007, it is hereby made absolutely clear that the Courts and Tribunals in Guwahati alone shall have the exclusive jurisdiction to entertain and settle any such disputes and claims.

IMPORTANT DATES FOR JAM 2007

Issue of Application Form and Information Brochure at Bank Counters / by Post only from the IITs / Commencement of Online Registration	November 13, 2006 (Monday)
Last date for receipt of requests at all IITs for issue of Application Form and Information Brochure by Post	December 26, 2006 (Tuesday)
Last date for issue of Application Form and Information Brochure at Bank Counters and JAM Offices	January 5, 2007 (Friday)
Last date for Online Registration	January 8, 2007 (Monday)
Last date for receipt of completed Application Form along with Pay-in-slip and Demand Draft (if any) / Online Registration Form along with Demand Draft at the Organising Institute (IIT Guwahati)	January 12, 2007 (Friday)
Date of JAM 2007 Test	March 25, 2007 (Sunday)
Announcement of the Result of JAM 2007 Test	At 0900 hrs on April 24, 2007 (Tuesday)
Issue of Admission Form by JAM Office of Organising Institute / Downloading from the Website of Organising Institute starts	April 25, 2007 (Wednesday)
Last date for receipt of completed Admission Form at the Organising Institute along with Demand Draft of Rs.300/- only	May 11, 2007 (Friday)

CONTACT ADDRESSES OF CHAIRMEN, JAM

Institute	Phone / Fax
IIT Bombay, Powai, Mumbai – 400 076	(022) 25767022 / 25722674
IIT Delhi, Hauz Khas, New Delhi –110 016	(011) 26591749 / 26581579
IIT Guwahati, Guwahati –781 039	(0361) 2582190 / 2692024
IIT Kanpur, Kanpur - 208 016	(0512) 2597412 / 2590932
IIT Kharagpur, Kharagpur – 721 302	(03222) 282097 / 282097
IIT Madras, Chennai – 600 036	(044) 22578200 / 22578204
IIT Roorkee, Roorkee – 247 667	(01332) 284531 / 285707

WEBSITES **E – mail**

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