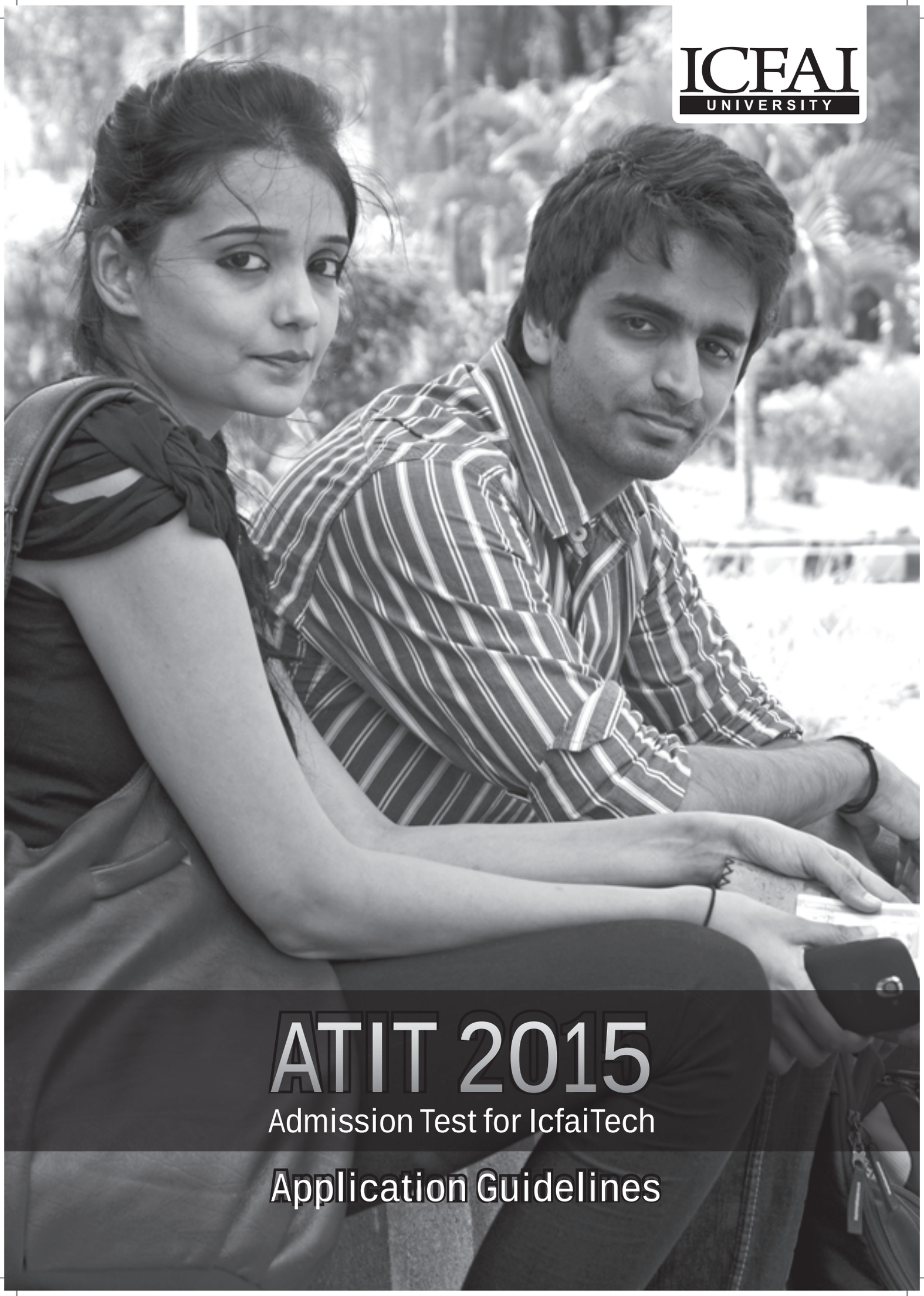

ICFAI UNIVERSITY

# ATIT 2015

## Admission Test for IcfaiTech

## Application Guidelines

# APPLICATION GUIDELINES

Admission Test for IcfaiTech (ATIT) is an All India Admission Test conducted by The ICFAI Foundation for Higher Education (IFHE), Hyderabad for students seeking admission into the B.Tech. Program.

The Faculty of Science and Technology of ICFAI Universities, at Agartala (Tripura), Baddi* (Himachal Pradesh), Dehradun (Uttarakhand), Hyderabad (Telangana), Jaipur (Rajasthan), Raipur (Chhattisgarh) and Ranchi (Jharkhand) offers admission into the B.Tech. Program to the eligible candidates based on the scores achieved in ATIT 2015.

** For admission into the B.Tech. program offered by the ICFAI University, HP (Baddi), the applicants must qualify JEE (Main) 2015 and are not required to take ATIT examination.*

ATIT 2015 is an aptitude test conducted in the following modes.

**(1) Online Test**: Computer Based Test (CBT) format. The test is scheduled from **May 04 to 18, 2015**. The test is of 2 hours duration and is conducted in 2-3 sessions per day at test centers all over India.

**(2) Offline Test**: Paper Based Test (PBT) format. The test is conducted on **May 03, 2015**. The test is of 2 hours duration conducted at select cities (Agartala, Aizawl, Baddi, Dehradun, Dimapur, Gangtok, Hyderabad, Imphal, Itanagar, Jaipur, Jamshedpur, Lucknow, Patna, Raipur, Ranchi, Shillong, Tura, Varanasi and Vijayawada). The answers have to be marked in the specially designed OMR answer sheet which will be provided at the time of the admission test.

Both online & offline tests constitute objective type questions in Mathematics, Physics, Chemistry and English in multiple choice format. There will be 30 questions in each of the subjects of Mathematics, Physics, Chemistry and English, as per the syllabus given on pages 13-16.

### Eligibility for admission into the B.Tech. Program:

**IFHE, Hyderabad & ICFAI University, Dehradun:** Students securing 60% aggregate in Class X and Class XII or its equivalent with Mathematics, Physics, Chemistry and English as subjects.

**ICFAI University, Himachal Pradesh:** Students securing 60% aggregate in Class XII or its equivalent with Mathematics, Physics, Chemistry and English as subjects. Applicants must qualify JEE (Main) 2015.

## ATIT SCHEDULE

| |
|---|
| Last date for receipt of completed OMR Application Form is **April 20, 2015** |
| Scheduling the ATIT 2015 by the candidates **March 09, 2015 to April 30, 2015** |
| ATIT Test Dates **Online: May 04, 2015 to May 18, 2015** **Offline: May 03, 2015 (10 am to 12 noon)** |
| Declaration of Results **May 29, 2015** |
| Dispatch of Selection Letters **May 30, 2015** onwards |
| Reporting and Registration **August 03, 2015** |
| Preparatory Classes **August 04, 2015** |
| Commencement of Classes **August 17, 2015** |

**Other ICFAI Universities:** Students securing 50% aggregate in Class XII or its equivalent with Mathematics, Physics, Chemistry and English as subjects.

Final year students of Class XII or its equivalent awaiting examination results may also apply.

Applicants should have completed 12 years of formal schooling in order to apply for the program. Admission will be offered based on scores secured in ATIT 2015 / JEE (Main) 2015 / State Level / Other National Level Engineering Entrance Tests (2015).

The applicant should fulfil the minimum age requirements as prescribed by the respective Board through which the applicant has appeared for the qualifying examination.

If an applicant is found ineligible for whatever reasons even after admission into the Program, his/her admission will be cancelled. All admissions will be subject to verification of facts from the original certificates / documents of the students. The decision of the Admissions Committee regarding eligibility of any applicant shall be final.

### How to Apply

Students interested in appearing for ATIT 2015 can apply by any one of the following methods.

### A) OMR Application Form

Applicants are required to fill up the OMR Application Form enclosed and send it to the Admissions Officer, ATIT at Hyderabad.

### B) Online Application

Applicants can apply online by filling up the Application Form available at *www.icfaiuniversity.in/atit* and make payment of ₹ 700 towards the cost using Credit/Debit Card (Visa / Master Card / Internet Banking) through secure internet payment gateway. Applicants applying online should upload their passport size color photograph while filling the Online Application. The ATIT Prospectus will be sent to such applicants.

### C) Download of Application Form

Alternatively, applicants can file their details online and download the Application Form from *www.icfaiuniversity.in/atit* and send it to the Admissions Office along with the Demand Draft of ₹ 700 towards the cost.

The DD should be drawn in favor of "IFHE A/c ATIT" payable at Hyderabad. The ATIT Prospectus will be sent to such applicants.

### Address for Correspondence

The completed OMR Application Form in case of physical application & downloaded filled-in application with DD should be sent to the Admissions Office, through speed post or courier to:

Admissions Officer (B.Tech. Program)
ATIT Office, III Floor, Plot # 65, Nagarjuna Hills,
Punjagutta, Hyderabad-500082, Telangana State.
Ph: 040-23440966/67/68,
**Toll Free: 1800-425-0767**
E-mail: btechadmissions@icfaiuniversity.in

### Admission Procedure for candidates appearing in ATIT 2015

Provisional admission is given based on the marks secured by the student in the ATIT 2015, subject to the student satisfying the eligibility criteria of admission. All applicants who are offered provisional admission will be required to produce the proof of having passed the qualifying examination (10+2 or equivalent) on or before **September 15, 2015**, failing which such provisional admission will stand cancelled.

### Admission Procedure for candidates applying based on JEE (Main) 2015 / State Level / Other National Level Engineering Entrance Tests (2015).

Candidates applying for admission on the above basis will be offered admission into the B.Tech. Program based on their scores in JEE (Main) 2015 / State Level/ Other National Level Engineering Entrance Tests (2015). ***Candidates may also appear in both ATIT 2015 and other tests in order to enhance the chances of getting admission.***

All candidates seeking admission based on the above test scores, should indicate their respective test Application Number in the OMR Application Form. They also have to submit the attested photocopy of the score card on or before **May 29, 2015**. Please note that the selection of the candidates will be withheld in case of non-receipt of the test score card before the due date.

### Choice of University & Branch of Engineering

All candidates seeking admission into the B.Tech. Program have to indicate maximum 5 preferences of University & Branch of Engineering in the Application Form.

### E-Mail

It is mandatory for all the applicants to indicate their e-mail ID, as all important information relating to ATIT will be intimated to the applicants by e-mail.

Similarly, all applicants are required to send their letters/ correspondence, by e-mail only, to btech*admissions@icfaiuniversity.in* clearly indicating their names and application number.

### Test Centers all over India

ATIT will be conducted at test centers across India. The applicants can choose any one of the test center (online/ offline) available for ATIT. The list of all the test centers is provided on Page 9. Please note that the requests for change of test center will not be entertained under normal circumstances.

ATIT Office reserves the right to add or delete few test centers depending upon the situation. The same will be intimated on the website *www.icfaiuniversity.in/atit* for the benefit of applicants.

### Last Date for Application

The last date for receipt of completed OMR Application Form is **April 20, 2015**. The OMR Application Forms received after the last date will not be considered.

All applicants are advised to adhere to the last date prescribed for submission of the application form. Please submit the application form as early as possible to improve the chances of getting the test center of your choice.

**ATIT 2015 Schedule for the candidates**

| Scheduling Dates |
|---|
| March 09, 2015 - April 30, 2015 |
| **Online Test Dates** |
| May 04, 2015 - May 18, 2015 |

The steps to be followed to schedule your slot for taking ATIT 2015:

Please visit the website *www.icfaiuniversity.in/atit* and under online slot booking, use "Book Slot for ATIT 2015".

Enter the ATIT 2015 OMR Application Number as Login ID and date of birth as Password in the box provided. The candidates are advised to change their password (min. 8 digits) soon after logging in, for security reasons.

Click submit, the Slot Booking Screen will open to permit the booking of slot for the test.

**Step-I**: Select city using the drop down box provided on the left side of the screen.

- Then select the test center from the drop down box provided below city drop down.

**Step–II & Step–III**: Select the date and time of the Test from the radio buttons.

- Select either By Time or By Date.
- Select By Date, displays a calendar allowing candidate to select the preferred test date and based on date selected, list of available slots are displayed to students.
- Select By Time, provides the list of available time slots and depending on time slot selected by the candidate, a calendar with available dates gets displayed.
- The candidate can follow either way to book a date and time for the test.

**Step–IV**: Submit and wait till process is completed.

**Step-V**: Verify the details shown and if found correct press the "Confirm" button.

- Please note that an applicant is permitted only once to exercise the change of slot after booking the slot based on the availability of the seats.

**Step-VI**: Click on the 'Print the Hall Ticket (Admit Card)' button for printing the Admit Card.

- Print the Hall Ticket (Admit Card) option is available on the screen.

(It is advised to print Hall Ticket (Admit Card) immediately to avoid problems. In the event of the printer not working, the candidate may print the admit card at later time).

**Re-entering the ATIT Scheduling System**

If the candidate have already completed the scheduling process but want to get another copy of admit card, go to *www.icfaiuniversity.in/atit* and use the "Application for ATIT 2015" link. Enter the Application Number as Login ID and date of birth as the password (if not changed) / or changed password.

**Test Process**

Candidate have to take the ATIT 2015 on a computer at the test center selected during the scheduling of the ATIT 2015 test. Computer experience or typing skills are not required to take the test. ATIT 2015 will begin with a short tutorial on the test and its features.

Please note that the candidate must arrive 45 minutes before the scheduled appointment. This allows time to sign in and for staff to verify the identification and documentation.

Candidates need to bring the following items to the test center:

1. **Admit Card**: Candidates must bring the Admit Card, to the test center. Candidates will not be allowed to appear for the test without it.
2. **Required Identification**: Candidate must present an original, valid (non-expired) form of photo identification before appearing for the test. The name on the photo identification must match with the name as entered in the ATIT 2015 registration.

Acceptable forms of photo identification are limited to: passport; Aadhar Card; voter ID; college ID or a notarized Affidavit with photo, signature, date of birth and residential address. Photocopies of the original are not acceptable.

**Note:** Candidates are not allowed to appear for ATIT 2015 without submitting appropriate photo identification.

**ATIT Results**

The results of the ATIT 2015 will be posted online on *www.icfaiuniversity.in/atit* on **May 29, 2015**. Successful candidates will be intimated individually through E-mail/post.

# Admission Modalities

### Allotment of University & Branch

The allotment of University & Branch of engineering is based on the candidate's performance in ATIT 2015/ JEE (Main) 2015 / State Level / Other National Level Engineering Entrance Tests (2015) and the preferences indicated in the Application Form.

Applicants will be intimated about the University & Branch allotted to them through selection letters dispatched from **May 30, 2015** onwards. Allotment of University & Branch will depend on the preferences given by the candidate. The decision of the Admissions Committee in alloting the University & Branch to the candidates will be final.

### Submission of Attested Photocopies of Certificates

All successful applicants will have to submit attested photocopies of relevant certificates (Class X and Class XII Marksheets, Birth Certificate, Transfer / Migration Certificate and Completion Certificate of the qualifying examination from the respective board) on **August 03, 2015** at the respective ICFAI Universitiy along with the original certificates. The original certificates will be returned to the applicants within a week's time after verification.

**For final year (10+2) students**: Final-year students of (10+2) who have not received the original certificates from the board by **August 03, 2015** will have to submit the same along with a set of photocopies on or before **September 15, 2015**. Their admissions will be confirmed only on receipt of the original certificates, and will be subject to their obtaining minimum stipulated percentage for admission into the B.Tech. Program.

### Commencement of Classes

The preparatory classes will commence from **August 04, 2015**. All students are advised to attend the preparatory classes. The regular classes for the first semester of the B.Tech. Program will commence from **August 17, 2015**.

# Accommodation and Transport Facility for Students

### Hostel Facility

Hostel facility is available within the campus at Hyderabad and Agartala.

**At Hyderabad:** Separate limited hostel facility is available at Hyderabad campus for both boys and girls.
**At Agartala:** Separate hostel facility is available within the campus for boys and girls.
**At Jaipur:** Hostel facility managed by the University is available for limited number of boys adjacent to the campus.
**At Baddi (HP):** Limited hostel facility is available within the campus.

**Hostel Charges**: The hostel charges for the respective locations will be mentioned in the selection letter for the selected candidates.

### Off campus Accommodation

At Dehradun, Raipur & Ranchi hostel facility is not available. However, for off campus accommodation campus administration will provide assistance choosing suitable accommodation for such students. Most of the students studying at these campuses have been staying in similar accommodation.

### Transport facility to campuses

At Baddi, Dehradun, Hyderabad, Jaipur & Raipur campuses, bus will be arranged to commute from city to campus and back on payment basis. Details will be provided in the selection letter.

# Fee Schedule for B.Tech. Program (2015-19)

Applicants selected for the B.Tech. Program are required to pay the fee as per the following schedule.

**Admission Fee:** The Admission Fee of ₹ 20,000 is to be paid by all selected students of B.Tech. Program (except IU Himachal Pradesh, IU Jaipur and IU Raipur) on or before **June 30, 2015.**

**Semester Fee:**

| The ICFAI University | Admission Fee (₹) | Caution Deposit (Refundable) | Semester Fee (Amount in ₹) | |
|---|---|---|---|---|
| | | | Domicile | Non-Domicile |
| Hyderabad | 20,000 | 10,000 | 85,000 | |
| Dehradun | 20,000 | 10,000 | 55,000 | 65,000 |
| Tripura | 20,000 | 10,000 | 42,000 | 52,500 |
| Jaipur | * | 10,000 | 40,000 | 50,000 |
| Jharkhand (Ranchi) | 20,000 | 10,000 | 40,000 | 50,000 |
| Raipur | * | 1,500 | 29,950 | |
| Himachal Pradesh (Baddi)** | * | 10,000 | 42,500 | |

* The students selected for IU Himachal Pradesh, IU Jaipur and IU Raipur need to pay ₹ 20,000 to reserve the seat on or before **June 30, 2015.** This amount will be adjusted in the 1st installment of tuition fee.

** IU Himachal Pradesh students need to pay ₹ 10,000 per annum towards the Institutional Development charges, in addition to the above fee.

All students joining the B.Tech. Program should pay the first semester fee on or before **August 03, 2015.**

Students should pay the fee for all eight semesters, as per the due dates indicated in the Student Handbook.

**Caution Deposit:** Students of B.Tech. Program are required to pay a refundable caution deposit as per the details given in the table along with the first semester fee. This deposit is towards use of library books, computers, labs and other facilities. The caution deposit will be refunded without interest (and after adjusting for dues, if any) to the students on completion of the program.

**Domicile Students:** Domicile fee is applicable only for the ICFAI Universities at Dehradun, Jaipur, Jharkhand and Tripura. The domicile status for B.Tech. students is their respective states except for Tripura@. **@ Domicile Status of Tripura**: Students from North East States. (North East States: Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura). **Non-Domicile:** Students from States other than North East States.

All students claiming the domicile status in the respective states are required to produce the necessary domicile certificates issued by the Government Authorities.

**Remittance:**

All payments should be made by way of Demand Draft as per the details given below:

| ICFAI University | Drawn in favour of | Payable at |
|---|---|---|
| IFHE | The ICFAI Foundation for Higher Education - Fee Collection A/c | Hyderabad |
| Dehradun | The ICFAI University Dehradun - Fee Collection A/c | Dehradun |
| Jaipur | The ICFAI University Jaipur - Fee Collection A/c | Jaipur |
| Tripura | The ICFAI University Tripura - Fee Collection A/c | Agartala |
| Jharkhand | The ICFAI University Jharkhand - Fee Collection A/c | Ranchi |
| Raipur | The ICFAI University Raipur - Fee Collection A/c | Raipur |
| Himachal Pradesh | The ICFAI University Himachal Pradesh - Fee Collection A/c | Baddi |

# Merit Scholarships

ICFAI Group offer merit scholarships to students pursuing the B.Tech. Program. The scholarships are based on performance in Class XII (or equivalent), ranks achieved in JEE (Main) 2015 or state level engineering entrance exams 2015 and Semester-wise performance during the B.Tech. Program.

**A. Merit Scholarships based on past academic record**: Percentage achieved in qualifying examination (10+2 or its equivalent) and ranks of national and local engineering entrance exams conducted in 2015 will decide the amount of scholarship. Scholarship will continue semester after semester only on maintaining the minimum 7.5 GPA. The details are as presented in the following table.

| University | Particulars | Amount of Scholarship* (₹) | |
|---|---|---|---|
| | | Domicile | Non-domicile |
| IFHE Hyderabad | ≥ 90% in 10 + 2/JEE (Main) 2015 Rank < 1000 / State Level Engineering Entrance Test 2015 Rank < 1000 | 1,00,000 | |
| | ≥ 80% - < 90% in 10 + 2/ JEE (Main) 2015 Rank 1001 to 5000 /State Level Engineering Entrance Test 2015 Rank 1001 to 5000 | 70,000 | |
| | ≥ 70% - < 80% in 10 + 2/ JEE (Main) 2015 Rank 5001 to 10000/State Level Engineering Entrance Test 2015 Rank 5001 to 10000 | 40,000 | |
| IU Dehradun | ≥ 90% in 10 + 2/ JEE (Main) 2015 Rank < 1000 | 66,000 | 78,000 |
| | ≥ 80% - < 90% in 10 + 2/ JEE (Main) 2015 Rank 1001 to 5000 | 44,000 | 52,000 |
| | ≥ 70% - < 80% in 10 + 2/ JEE (Main) 2015 Rank 5001 to 10000 | 26,000 | 31,000 |
| IU Tripura | ≥ 90% in 10 + 2/ JEE (Mains) 2015 Rank < 1000/ Tripura JEE 2015 Rank < 1000 | 50,000 | 63,000 |
| | ≥ 80% - < 90% in 10 + 2/ JEE (Main) 2015 Rank 1001 to 5000/ Tripura JEE 2015 Rank 1001 to 5000 | 33,000 | 42,000 |
| | ≥ 70% - < 80% in 10 + 2/ JEE (Main) 2015 Rank 5001 to 10000/ Tripura JEE 2015 Rank 5001 to 10000 | 20,000 | 25,000 |
| IU Jaipur | ≥ 90% in 10 + 2/ JEE (Main) 2015 Rank < 1000/ RPET 2015 Rank < 1000 | 48,000 | 60,000 |
| | ≥ 80% - < 90% in 10 + 2/ JEE (Main) 2015 Rank 1001 to 5000/ RPET 2015 Rank 1001 to 5000 | 32,000 | 40,000 |
| | ≥70% - < 80% in 10 + 2/ JEE (Main) 2015 Rank 5001 to 10000/ RPET 2015 Rank 5001 to 10000 | 19,000 | 24,000 |
| IU Raipur | ≥ 90% in 10 + 2/ JEE (Main) 2015 Rank < 1000/CG PET 2015 Rank < 1000 | 36,000 | |
| | ≥ 80% - < 90% in 10 + 2/ JEE (Main) 2015 Rank 1001 to 5000/ CG PET 2015 Rank 1001 to 5000 | 24,000 | |
| | ≥ 70% - < 80% in 10 + 2/ JEE (Main) 2015 Rank 5001 to 10000/ CG PET 2015 Rank 5001 to 10000 | 14,000 | |
| IU Jharkhand | ≥ 90% in 10 + 2/ JEE (Main) 2015 Rank < 1000/ JCECE 2015 Rank < 1000 | 48,000 | 60,000 |
| | ≥ 80% - < 90% in 10 + 2/ JEE (Main) 2015 Rank 1001 to 5000/ JCECE 2015 Rank 1001 to 5000 | 32,000 | 40,000 |
| | ≥ 70% - < 80% in 10 + 2/ JEE (Main) 2015 Rank 5001 to 10000/ JCECE 2015 Rank 5001 to 10000 | 19,000 | 24,000 |
| IU Himachal Pradesh | ≥ 90% in 10 + 2/ JEE (Main) 2015 Rank < 1000 | 51,000 | |
| | ≥ 80% - < 90% in 10 + 2/ JEE (Main) 2015 Rank 1001 to 5000 | 34,000 | |
| | ≥ 70% - < 80% in 10 + 2/ JEE (Main) 2015 Rank 5001 to 10000 | 20,000 | |

** Above scholarship amount would be adjusted equally in 8 installments in each semester fee payable.*

*Note: IU denotes ICFAI University*

**B. Merit Scholarships based on Semester-wise Performance:** Up to 10% of the students of the batch will be awarded merit scholarships based on their Semester-wise performance (Details presented in the table given below). These scholarships can be claimed in addition to the scholarships based on the past academic record.

| Academic Performance (CGPA) | Category I | Category II | Category III |
|---|---|---|---|
| | ≥ 9.00 | ≥ 8.50 - < 9.00 | ≥ 8.00 - < 8.50 |
| % of Tuition fee of the semester will be awarded as scholarship | 30 | 22 | 15 |

# Educational Loans

The list of banks offering loans to the students of the IFHE are:

| | |
|---|---|
| Allahabad Bank | Andhra Bank |
| Bank of Baroda | Bank of India |
| Bank of Maharashtra | Canara Bank |
| Central Bank of India | Corporation Bank |
| Credila Financial Services | HDFC Bank |
| Oriental Bank of Commerce | Punjab National Bank |
| State Bank of Bikaner & Jaipur | State Bank of Hyderabad |
| State Bank of India | Syndicate Bank |
| UCO Bank | Union Bank of India |

**Common Highlights (for all banks)**

**Loan Amount:**

Minimum of ₹ 1 lakh - Maximum of ₹10 lakhs.

**Rate of Interest:** 12% to 14%@

@Based on RBI and respective bank regulations.

**Margin:** Upto ₹ 4 lakhs: Nil

Above ₹ 4 lakhs: 5% to 15%

**Security:** Upto ₹ 4 lakhs: Nil

₹ 4 lakhs - ₹ 7.5 lakhs: Third Party Guarantee acceptable to Bank having adequate net worth.

Above ₹ 7.5 lakhs: Collateral Security equal to 125% of loan amount.

**Repayment**

Repayment Moratorium: Course period+1 year, or six months after getting a job whichever is earlier as prescribed by the bank. The loan amount is to be repaid in 5 - 7 years after commencement of repayment.

**Documents Required**

Copies of certificates with regard to educational qualifications, admission letter, quotations from college authority stating coverage of expenses, income proof of parent, assets and liabilities statement of parent/guarantor, if any.

# Test Center Regulations

Please note that the following regulations and procedures will be observed at each test center to ensure that all candidates appear for the test under equally favourable conditions. Failing to follow any of the security procedures may result in the disqualification from the test. The University reserves the right to audiotape and videotape any test session.

**References**: No reference materials, papers or study materials are allowed at the test center. If any candidate is found with these or any other aids, he/she will not be allowed to continue the test and the answers will not be evaluated. Candidates will be provided with scratch papers to use during the test session. These items (used and unused) must be returned at the end of the test session. Removing scratch paper from the test center will be considered as an act of misconduct.

**Personal Items**: Personal items other than identification documents, are not allowed in the test room. This includes cell phones, PDAs, BlackBerry® devices, digital / analog watches, and any other electronic or photographic devices. Candidates will not have access to their personal items during the test. All the candidates are advised to follow the directions of the test center staff, failing which they will not be permitted to take the test. Any violation of this procedure during the test may result in cancellation of the scores, dismissal by the test center staff, or banning from future test. Test Centers and the University assume no responsibility for personal items or devices that the candidate choose to bring into the test center.

**Breaks**: There are no scheduled or unscheduled breaks. Candidates have to be seated in their allotted seats at the test center throughout the test unless asked to leave by an authorized test center staff member.

**Visitors**: Friends or relatives who accompany the candidate to the test center are not allowed to wait at the test center or be in contact while taking the test.

**Misconduct or Disruptive Behaviour**: Candidates who engage in any kind of misconduct or disruptive or offensive behaviour may be dismissed from the test. Examples are: giving or receiving help, taking part in an act of impersonation, removing test materials or notes from the testing room, using rude or offensive language and behaviour that delays or interrupts test.

**Weapons**: Weapons are strictly prohibited at the test center.

**Questions on Test Content**: Test center administrators are not allowed to answer any questions pertaining to the test content. If the candidates do not understand a question on the test, they should answer the question to the best of their ability.

# Test Centers*

ATIT 2015 will be conducted at test centers all over India. The applicants can choose any one of the test centers available for ATIT. The list of the test centers is given below.

| Online Test Centers & Codes | |
|---|---|
| **State** | **Test Center City (code)** |
| ANDHRA PRADESH | Vijayawada (103) |
| | Visakhapatnam (104) |
| ASSAM | Guwahati (111) |
| BIHAR | Patna (121) |
| CHHATTISGARH | Bilaspur (131) |
| | Raipur (132) |
| GUJARAT | Ahmedabad (141) |
| | Surat (142) |
| | Vadodara (143) |
| HARYANA | Rohtak (151) |
| HIMACHAL PRADESH | Shimla (161) |
| JAMMU & KASHMIR | Jammu (171) |
| JHARKHAND | Jamshedpur (181) |
| | Ranchi (182) |
| KARNATAKA | Bengaluru-Kormangala (191) |
| MADHYA PRADESH | Bhopal (201) |
| | Indore (202) |
| | Gwalior (203) |
| | Jabalpur (204) |
| MAHARASHTRA | Mumbai – Dadar (211) |
| | Nagpur (212) |
| | Pune (213) |
| NEW DELHI & NCR | Faridabad (221) |
| | Ghaziabad (222) |
| | Gurgaon (223) |
| | Delhi - Paschim Vihar (224) |
| | Delhi - PV I (225) |
| | Delhi - Vivek Vihar (226) |
| | Noida (227) |
| ORISSA | Bhubaneswar (231) |
| PUNJAB | Amritsar (241) |
| | Jalandhar (242) |
| | Ludhiana (243) |
| RAJASTHAN | Jaipur (251) |
| | Udaipur (252) |
| | Kota (254) |
| TAMIL NADU | Chennai (261) |
| TELANGANA | Hyderabad (101) |
| | Secunderabad (102) |
| TRIPURA | Agartala (301) |
| UNION TERRITORY | Chandigarh (244) |
| UTTARAKHAND | Dehradun (271) |
| UTTAR PRADESH | Agra (281) |
| | Bareilly (282) |
| | Kanpur (283) |
| | Lucknow (284) |
| | Meerut (285) |
| | Allahabad (286) |
| | Gorakhpur (287) |
| | Varanasi (288) |
| WEST BENGAL | Kolkata (291) |

| Offline Test Centers & Codes | |
|---|---|
| **State** | **Test Center City (code)** |
| ANDHRA PRADESH | Vijayawada (511) |
| ARUNACHAL PRADESH | Itanagar (519) |
| BIHAR | Patna (510) |
| CHHATTISGARH | Raipur (504) |
| HIMACHAL PRADESH | Baddi (505) |
| JHARKHAND | Ranchi (506) |
| | Jamshedpur (507) |
| MANIPUR | Imphal (518) |
| MEGHALAYA | Shillong (514) |
| | Tura (515) |
| MIZORAM | Aizwal (517) |
| NAGALAND | Dimapur (516) |
| RAJASTHAN | Jaipur (503) |
| SIKKIM | Gangtok (513) |
| TELANGANA | Hyderabad (501) |
| TRIPURA | Agartala (512) |
| UTTARAKHAND | Dehradun (502) |
| UTTAR PRADESH | Lucknow (508) |
| | Varanasi (509) |

**For latest update on test centers please visit www.icfaiuniversity.in/atit*

# Instructions for filling the OMR Application Form for ATIT 2015

Please read the guidelines carefully before filling the OMR Application Form for ATIT 2015.

**General Guidelines:**

The application form will be scanned by Optical Mark Reader (OMR), a computer-based machine. Therefore, utmost care should be taken while filling the data in the application form.

- Mark your response only in the space provided for the purpose. Response marked elsewhere will not be considered. Fill the boxes in the form first and then proceed to darken the relevant circles.
- Use HB Pencil only for filling up information items 1 to 14 of the OMR application form. Please darken the appropriate circles with due care.
- Completely darken the respective circle for your response. You may change a mark by completely erasing the wrongly filled circle. The erasure should be complete and without any smudges as partially erased mark may lead to wrong reading by the computer.
- Fill up the OMR Application Form using black / blue ball point pen from item no.15 onwards. Avoid over-writing.
- Please do not write or mark on this application form outside the demarcated areas.
- Do not pin or staple any thing with the OMR application form.
- Insert the duly filled in OMR application form in the special envelope provided and dispatch/deposit envelope to the address mentioned on page 3.
- The OMR application form should not be folded.
- Do not make any stray marks on the OMR application form.
- Keep a photocopy of the completed OMR application form for your records.
- Ensure complete correctness of the details provided in OMR application form.
- While stating the year under appropriate items, (eg: date of birth or year of completing qualification), use the notation as given in the following examples:
- Year 1998 should be indicated as [9][8]
- Year 2015 should be indicated as [1][5]

**Guidelines for filling individual items**

The OMR application form contains 23 individual items. All items have to be filled in carefully, as per the guidelines, before dispatching the completed application form.

1. **Name of the Applicant:**

Write your name, in capital letters, in the boxes provided. Leave one box vacant between each initial.

Example: Full name: Arun Kumar Mishra

Write as: [A][ ][K][ ][M][I][S][H][R][A]

Darken the corresponding circles accordingly.

2. **Application Number:** The OMR application form has a unique 5 digit application number. Write your application number in the boxes and darken the corresponding circles.
3. **Test Option**: You can choose either online or offline test.
4. **Test Center**: You can choose any one test center available for ATIT (please refer page 9). Enter the test center code number in the box and darken the corresponding circles.

   **Codes for Test Center**: Please note the code numbers of the test centers given in the brackets (please refer page 9). Enter the code in the box and darken the corresponding circles under item No.4. As this is very important, please double check the code.
5. **Gender**: Darken the appropriate circle.
6. **Citizenship**: Indicate whether a citizen of India or not.
7. **Date of Birth**: Fill in your date of birth in the boxes and darken the appropriate circles. An example is given below:

   Date of birth: 9 December, 1997 should appear as

| Date | Month | Year |
|---|---|---|
| [0][9] | [1][2] | [9][7] |

8. **Admission Test Appearing for**: Indicate as applicable.
9. **Academic Record**:

a) **X Class**: **Aggregate Marks (%)**: Indicate the percentage of aggregate marks in the boxes provided and darken the appropriate circles.

**Year of Passing**: Indicate the year in which you have passed X Class.

b) **XI Class: Aggregate Marks (%)**: Indicate the percentage of aggregate marks in the boxes provided and darken the appropriate circles.

**Year of Passing**: Indicate the year in which you have passed XI Class.

c) **XII Class: Aggregate Marks (%)**: Indicate the percentage of aggregate marks in the boxes provided and darken the appropriate circles.

**Year of Passing**: Indicate the year in which you have passed XII Class. If Class XII marks are not received, indicate the Class XI marks.

10. **University & Branch Preferences**: Please select the desired University & Branch and indicate your five preferences in the boxes provided and darken the circles corresponding to the appropriate code you have selected in the order of priority given below.

    Please select the desired University / Branch of Engineering from the table given below:

| University | Code | University | Code |
|---|---|---|---|
| IFHE, Hyderabad | 0 | ICFAI University, Dehradun | 1 |
| ICFAI University, Tripura | 2 | ICFAI University, Jaipur | 3 |
| ICFAI University, Raipur | 4 | ICFAI University, Jharkhand | 5 |
| ICFAI University, Himachal Pradesh | 6 | | |
| **Branch** | **Code** | **Branch** | **Code** |
| Civil Engineering | 1 | Computer Science & Engineering | 2 |
| Electronics & Communications Engineering | 3 | Mechanical Engineering | 4 |
| Electrical & Electronics Engineering | 5 | ***NOTE: Candidates may indicate maximum five preferences in the OMR Application Form.*** | |

***EXAMPLE: If your preference is ICFAI University, Dehradun and the Branch is Electronics & Communications Engineering, the code would read as "13".***

***Similarly, if your preference is ICFAI University, Himachal Pradesh and the Branch is Mechanical Engineering, the code would read as "64".***

***Important Note: All the Universities do not offer all the Branches. Please refer the prospectus before marking the preferences.***

11. **Address**: Write your mailing address clearly in the boxes and darken the corresponding circles. Do not write your name.

12. **State and Union Territory Code**: Select the State/UT code correctly for purpose of your mailing address from the given list to indicate your State/Union Territory.

| States | Code |
|---|---|
| Andhra Pradesh | 01 |
| Arunachal Pradesh | 02 |
| Assam | 03 |
| Bihar | 04 |
| Chhattisgarh | 05 |
| Delhi | 06 |
| Goa | 07 |
| Gujarat | 08 |
| Haryana | 09 |
| Himachal Pradesh | 10 |
| Jammu and Kashmir | 11 |
| Jharkhand | 12 |
| Karnataka | 13 |
| Kerala | 14 |
| Madhya Pradesh | 15 |
| Maharashtra | 16 |
| Manipur | 17 |
| Meghalaya | 18 |
| Mizoram | 19 |
| Nagaland | 20 |
| Orissa | 21 |
| Punjab | 22 |
| Rajasthan | 23 |
| Sikkim | 24 |
| Tamil Nadu | 25 |
| Telangana | 26 |
| Tripura | 27 |
| Uttar Pradesh | 28 |
| Uttarakhand | 29 |
| West Bengal | 30 |
| **Union Territories** | **Code** |
| Andaman and Nicobar Islands | 31 |
| Chandigarh | 32 |
| Dadra and Nagar Haveli | 33 |
| Daman and Diu | 34 |
| Lakshadweep Islands | 35 |
| Pondicherry | 36 |

13. **Pincode**: State the pincode of your city/town as a part of your mailing address accurately in the boxes and darken the corresponding circles.
14. **STD Code and Telephone Number**: State your contact telephone number. Indicate the STD code of your city/town/village followed by the telephone number. Do not leave a blank space in between the STD code and the telephone number.
15. **Name**: Write your name in capital letters as it appears in item no.1 of the OMR Application Form.

    **Color Photograph**: Affix your recent color photograph (Passport Size).
16. **Father Name**: Write your father's name in capital letters.
17. **Mobile Number**: Indicate your mobile number in the boxes provided.
18. **E-Mail Address**: E-mail will be extensively used during the admission process by ATIT Office to intimate the applicants of the important developments. Please ensure that you fill it carefully, legibly and accurately.
19. **Name & Address of the College/School**: Write the complete name & address of the college from which you have completed / are pursuing your XII Class.
20. **Name of the Board**: Indicate the name of the Board from which you have completed / are pursuing your XII Class.
21. **Syllabus (in XII Class)**: Indicate the Syllabus for study of XII Class in the appropriate box.
22. **JEE (Main) 2015 / State Level / Other National Level Engineering Entrance Tests (2015 Application No.**: Candidates applying for admission on the basis of JEE (Main) 2015 / State Level / Other National Level Engineering Entrance Tests scores have to indicate their respective Test Application Number. They are required to send a photocopy of the scorecard on or before **May 29, 2015**.
23. **Declaration:** Please read the declaration carefully and sign.

**CHECKLIST**

- Do not fold the OMR Application Form.
- Do not pin or staple anything to the OMR Application Form.
- Use the enclosed envelope to send the completed OMR Application Form to:

  Admissions Officer (B.Tech. Program),
  ATIT Office, 3rd Floor, Plot #65, Nagarjuna Hills, Punjagutta, Hyderabad-500 082, Telangana State.
- Keep a photocopy of completed OMR Application Form with you.
- Send the OMR Application Form by speedpost/courier only.
- Last date for receipt of completed application form is **April 20, 2015**. Please send the filled in Application Form as early as possible.

# ATIT 2015 - Syllabus

## MATHEMATICS

**Sets, Relations and Functions:** Sets and their Representations, Union, intersection and complements of sets, and their algebraic properties, Relations, equivalence relations, mappings, one-one, into and onto mappings, composition of mappings.

**Complex Numbers:** Complex numbers in the form a+ib and their representation in a plane. Argand diagram. Algebra of complex numbers, Modulus and Argument (or amplitude) of a complex number, square root of a complex number. Cube roots of unity, triangle inequality.

**Matrices and Determinants:** Determinants and matrices of order two and three, properties of determinants, Evaluation of determinants. Area of triangles using determinants, Addition and multiplication of matrices, adjoint and inverse of matrix. Test of consistency and solution of simultaneous linear equations using determinants and matrices.

**Quadratic Equations:** Quadratic equations in real and complex number system and their solutions. Relation between roots and co-efficients, nature of roots, formation of quadratic equations with given roots; Symmetric functions of roots, equations reducible to quadratic equations – application to practical problems.

**Permutations and Combinations:** Fundamental principle of counting; Permutation as an arrangement and combination as selection, Meaning of P(n,r) and C(n,r). Simple applications.

**Mathematical Induction and its Applications**

**Binomial Theorem and its Applications:** Binomial Theorem for a positive integral index; general term and middle term; Binomial Theorem for any index. Properties of Binomial Co-efficients. Simple applications for approximations.

**Sequences and Series:** Arithmetic, Geometric and Harmonic progressions. Insertion of Arithmetic Geometric and Harmonic means between two given numbers. Relation between A.M., G.M. and H.M.Special series: Sn, Sn2, Sn3. Arithmetico-Geometric Series, Exponential and Logarithmic series.

**Differential Calculus:** Polynomials, rational, trigonometric, logarithmic and exponential functions, Inverse functions. Graphs of simple functions. Limits, Continuity; differentiation of the sum, difference, product and quotient of two functions. differentiation of trigonometric, inverse trigonometric, logarithmic, exponential, composite and implicit functions; derivatives of order upto two. Applications of derivatives: Rate of change of quantities, monotonic - increasing and decreasing functions, Maxima and minima of functions of one variable, tangents and normals, Rolle's and Lagrange's Mean Value Theorems.

**Integral Calculus:** Integral as an anti-derivative. Fundamental integrals involving algebraic, trigonometric, exponential and logarithmic functions. Integration by substitution, by parts and by partial fractions. Integration using trigonometric identities. Integral as limit of a sum. Properties of definite integrals. Evaluation of definite integrals; Determining areas of the regions bounded by simple curves.

**Differential Equations:** Ordinary differential equations, their order and degree. Formation of differential equations. Solution of differential equations by the method of separation of variables. Solution of homogeneous and linear differential equations.

**Two Dimensional Geometry:** Recall of Cartesian system of rectangular co-ordinates in a plane, distance formula, area of a triangle, condition for the collinearity of three points and section formula, centroid and in-centre of a triangle, locus and its equation, translation of axes, slope of a line, parallel and perpendicular lines, intercepts of a line on the coordinate axes.

- The straight line and pair of straight lines: Various forms of equations of a line, intersection of lines, angles between two lines, conditions for concurrence of three lines, distance of a point from a line Equations of internal and external bisectors of angles between two lines, coordinates of centroid, orthocentre and circumcentre of a triangle, equation of family of lines passing through the point of intersection of two lines, homogeneous equation of second degree in x and y, angle between pair of lines through the origin, combined equation of the bisectors of the angles between a pair of lines, condition for the general second degree equation to represent a pair of lines, point of intersection and angle between two lines.
- Circles and Family of Circles : Standard form of equation of a circle, general form of the equation of a circle, its radius and centre, equation of a circle in the parametric form, equation of a circle when the end points of a diameter are given, points of intersection of a line and a circle with the centre at the origin and condition for a line to be tangent to the circle, length of the tangent, equation of the tangent, equation of a family of circles through the intersection of two circles, condition for two intersecting circles to be orthogonal.
- Conic Sections: Sections of cones, equations of conic sections (parabola, ellipse and hyperbola) in standard forms, condition for $y = mx + c$ to be a tangent and point(s) of tangency.

**Three Dimensional Geometry:** Coordinates of a point in space, distance between two points; Section formula, direction ratios and direction cosines, angle between two intersecting lines. Skew lines, the shortest distance between them and its equation. Equations of a line and a plane in different forms; intersection of a line and a plane, coplanar lines, equation of a sphere, its centre and radius. Diameter form of the equation of a sphere.

**Vector Algebra:** Vectors and Scalars, addition of vectors, components of a vector in two dimensions and three dimensional space, scalar and vector products, scalar and vector triple product. Application of vectors to plane geometry.

**Measures of Central Tendency and Dispersion:** Calculation of Mean, median and mode of grouped and ungrouped data. Calculation of standard deviation, variance and mean deviation for grouped and ungrouped data.

**Probability:** Probability of an event, addition and multiplication theorems of probability and their applications; Conditional probability; Bayes' Theorem, Probability distribution of a random variate; Binomial and Poisson distributions and their properties.

**Trigonometry:** Trigonometrical identities and equations. Inverse trigonometric functions and their properties. Properties of triangles, including centroid, incentre, circum- centre and orthocentre, solution of triangles. Heights and Distances.

**Statics:** Introduction, basic concepts and basic laws of mechanics, force, resultant of forces acting at a point, parallelogram law of forces, resolved parts of a force, Equilibrium of a particle under three concurrent forces, triangle law of forces and its converse, Lami's theorem and its converse, Two parallel forces, like and unlike parallel forces, couple and its moment.

**Dynamics:** Speed and velocity, average speed, instantaneous speed, acceleration and retardation, resultant of two velocities. Motion of a particle along a line, moving with constant acceleration. Motion under gravity. Laws of motion, Projectile motion.

## PHYSICS

**Units and Measurement:** Units for measurement, system of units – S.I., fundamental and derived units. Dimensions and their applications.

**Description of Motion in One Dimension:** Motion in a straight line, uniform and non-uniform motion, their graphical representation. Uniformly accelerated motion, and its applications.

**Description of Motion in Two and Three Dimensions:** Scalars and vectors, vector addition, a real number, zero vector and its properties. Resolution of vectors. Scalar and vector products, uniform circular motion and its applications projectile motion.

**Laws of Motion:** Force and inertia – Newton 's Laws of Motion. Conservation of linear momentum and its applications, rocket propulsion, friction – laws of friction.

**Work, Energy and Power:** Concept of work, energy and power. Energy – kinetic and potential. Conservation of energy and its applications, Elastic collisions in one and two dimensions. Different forms of energy.

**Rotational Motion and Moment of Inertia:** Centre of mass of a two-particle system. Centre of mass of a rigid body, general motion of a rigid body, nature of rotational motion, torque, angular momentum, its conservation and applications. Moment of Inertia, parallel and perpendicular axes theorem, expression of moment of inertia for ring, disc and sphere.

**Gravitation:** Acceleration due to gravity, one and two-dimensional motion under gravity. Universal law of gravitation, variation in the acceleration due to gravity of the earth. Planetary motion, Kepler's laws, artificial satellite – geostationary satellite, gravitational potential energy near the surface of earth, gravitational potential and escape velocity.

**Solids and Fluids:** Inter-atomic and Inter-molecular forces, states of matter. (A) Solids : Elastic properties, Hook's law, Young's modulus, bulk modulus, modulus of rigidity. (B) Liquids : Cohesion and adhesion. Surface energy and surface tension. Flow of fluids, Bernoulli's theorem and its applications. Viscosity, Stoke's Law, terminal velocity.

**Oscillations:** Periodic motion, simple harmonic motion and its equation of motion, energy in S.H.M., Oscillations of a spring and simple pendulum.

**Waves:** Wave motion, speed of a wave, longitudinal and transverse waves, superposition of waves, progressive and standing waves, free and forced Oscillations, resonance, vibration of strings and air-columns, beats, Doppler effect.

**Heat and Thermodynamics:** Thermal expansion of solids, liquids and gases and their specific heats, Relationship between Cp and Cv for gases, first law of thermodynamics, thermodynamic processes. Second law of thermodynamics, Carnot cycle, efficiency of heat engines.

**Transference of Heat:** Modes of transference of heat. Thermal conductivity. Black body radiations, Kirchoff's Law, Wien's law, Stefan's law of radiation and Newton 's law of cooling.

**Electrostatics:** Electric charge – its unit and conservation, Coulomb's law, dielectric constant, electric field, lines of force, field due to dipole and its behaviour in a uniform electric field, electric flux, Gauss's theorem and its applications. Electric potential, potential due to a point charge. Conductors and insulators, distribution of charge on conductors. Capacitance, parallel plate capacitor, combination of capacitors, energy of capacitor.

**Current Electricity:** Electric current and its unit, sources of energy, cells- primary and secondary, grouping of cells resistance of different materials, temperature dependence, specific resistivity, Ohm's law, Kirchoff's law, series and parallel circuits. Wheatstone Bridge with their applications and potentiometer with their applications.

**Thermal and Chemical Effects of Currents:** Heating effects of current, electric power, simple concept of thermo-electricity – Seeback effect and thermocouple, Chemical effect of current – Faraday's laws of electrolysis.

**Magnetic Effects of Currents:** Oersted's experiment, Bio-Savert's law, magnetic field due to straight wire, circular loop and solenoid, force on a moving charge in a uniform magnetic field (Lorentz force), forces and torques on currents in a magnetic field, force between two current carrying wires, moving coil galvanometer and conversion to ammeter and voltmeter.

**Magnetostatics:** Bar magnet, magnetic field, lines of force, torque on a bar magnet in a magnetic field, earth's magnetic field, para, dia and ferro magnetism, magnetic induction, magnetic susceptibility.

**Electromagnetic Induction and Alternating Currents:** Induced e.m.f., Faraday's Law, Lenz's Law, Self and Mutual Inductance, alternating currents, impedance and reactance, power In a.c. Circuits with L.C. And R Series Combination, resonant circuits. Transformer and A.C. generator.

**Ray Optics:** Reflection and refraction of light at plane and curved surfaces, total internal reflection, optical fibre; deviation and dispersion of light by a prism; Lens formula, magnification and resolving power; microscope and telescope.

**Wave Optics:** Wave nature of light; Interference – Young's double slit experiment. Diffraction - diffraction due to a single slit. Elementary idea of polarization.

**Electromagnetic Waves:** Electromagnetic waves and their characteristics, Electromagnetic wave spectrum from gamma to radio waves – propagation of EM waves in atmosphere.

**Electron and Photons:** Charge on an electron, e/m for an electron, photoelectric effect and Einstein's equation of photoelectric effect.

**Atoms, Molecules and Nuclei:** Alpha - particles scattering experiment, Atomic masses, size of the nucleus; radioactivity; Alpha, beta and gamma particles/ rays and their properties, radioactive decay law, half life and mean life of radio-active nuclei, binding energy, mass energy relationship, nuclear fission and nuclear fusion.

**Solids and Semi-conductors Devices:** Energy bands in solids, conductors, insulators and semi-conductors, pn junction, diodes, diode as rectifier, transistor action, transistor as an amplifier.

## CHEMISTRY

**Some Basic Concepts:** Measurement in chemistry (Precision, significant figures, SI units, Dimensional analysis). Laws of chemical combination. Atomic Mass, Molecular Mass, mole concept, Molar Mass, determination of Molecular formula. Chemical equation, stoichiometry of Chemical reactions.

**States of Matter:** Gaseous state, measurable properties of gases, Boyle's Law, Charle's Law and absolute scale of temperature, Avogadro's hypothesis, ideal gas equation, Dalton's law of partial pressures.

Kinetic molecular theory of gases (the microscopic model of gas), deviation form ideal behaviour.

The solid state (classification of solids, X-ray studies of crystal lattices and unit cells, packing of constituent particles in crystals). Imperfection in solids, electrical, magnetic and dielectic properties of solids. Liquid state (Properties of liquids, Vapour pressure, Surface tension, Viscosity).

**Atomic Structure:** Constituents of the atom (discovery of electron, rutherford model of the atom).

Electronic structure of atoms – nature of light and electromagnetic waves, atomic spectra, bohr's model of hydrogen, shortcomings of the bohr model.

Dual nature of matter and radiation. de-Broglie relation. The uncertainty principle, Quantum Mechanical Model of the atom, Orbitals and Quantum numbers. Shapes of orbitals. Aufbau

principle, Pauli Exclusion Principle, Hund's Rule, Electronic Configuration of atoms.

**Solutions:** Types of solutions, Units of concentration, Vapour-pressure of solutions and Raoult's law. Colligative properties. Determination of molecular mass. Non-ideal solutions and abnormal molecular masses. Volumetric analysis-concentration unit.

**Chemical Energetics and Thermodynamics:** Energy changes during a chemical reaction, Internal energy and Enthalpy, Internal energy and Enthalpy changes, Origin of Enthalpy change in a reaction, Hess's Law of constant heat summation, numericals based on these concepts. Enthalpies of reactions(Enthalpy of neutralization, Enthalpy of combustion, Enthalpy of fusion and vaporization).

Sources of energy (conservation of energy sources and identification of alternative sources, pollution associated with consumption of fuels. The sun as the primary source).

First law of thermodynamics; Relation between Internal energy and Enthalpy, application of first law of thermodynamics.

**Second law of thermodynamics:** Entropy, Gibbs energy, Spontaneity of a chemical reaction, Gibbs energy change and chemical equilibrium, Gibbs energy available for useful work.

**Chemical Equilibrium:** Equilibria involving physical changes (solid-liquid, liquid-gas equilibrium involving dissolution of solids in liquids, gases in liquids, general characteristics of equilibrium involving physical processes).

Equilibria involving chemical systems (the law of chemical equilibrium, the magnitude of the equilibrium constant, numerical problems).

Effect of changing conditions of systems at equilibrium (change of concentration, change of temperature, effect of catalyst-Le Chateliar's principle).

Equilibria involving ions — ionization of electrolytes, weak and strong electrolytes, acid-base equilibrium, various concepts of acids and bases, ionization of water, pH scale, solubility product, numericals based on these concepts.

**Redox Reactions and Electrochemistry:** Oxidation and reduction as an electron transfer concept. Redox reactions in aqueous solutions-electrochemical cells. EMF of a galvanic cell. Dependence of EMF on concentration and temperature (NERNST equation and numerical problems based on it). Electrolysis, Oxidation number (rules for assigning oxidation number, redox reactions in terms of oxidation number, nomenclature). Balancing of oxidation-reduction equations.

Electrolytic conduction. Molar conductivity, Kohlrausch's Law and its applications, Voltaic cell, Electrode potential and Electromotive force, Gibb's energy change and cell potential. Electrode potential and products of electrolysis, Fuel cells, corrosion and its prevention.

**Rates of Chemical Reactions and Chemical Kinetics:** Rate of reaction, Instantaneous rate of reaction and order of reaction. Factors affecting rates of reactions - factors affecting rate of collisions encountered between the reactant molecules, effect of temperature on the reaction rate, concept of activation energy, catalyst. Effect of light on rates of reactions. Elementary reactions as steps to more complex reactions. How fast are chemical reactions?

Rate law expression. Order of a reaction (with suitable examples). Units of rates and specific rate constants. Order of reaction and effect of concentration (study will be confined to first order only). Temperature dependence of rate constant – Fast reactions (only elementary idea). Mechanism of reaction (only elementary idea). Photochemical reactions.

**Surface Chemistry:** Surfaces: Adsorption – Physical and chemical adsorption, adsorption isotherms Colloids – Preparation and general properties, Emulsions, Micelles Catalysis: Homogeneous and heterogeneous, structure of catalyst, Enzymes, Zeolites.

**Chemical Families – Periodic Properties:** Modern periodic law, Types of elements – Representative elements (s & p block), Transition elements –d-block elements, inner transition elements – f-block elements). Periodic trends in properties – ionization enthalpy, electron gain enthalpy, atomic radii, valence, periodicity in properties of compounds).

**Chemical Bonding and Molecular Structure:** Chemical bonds and Lewis structure, shapes of molecules (VSEPR theory). Quantum theory of the covalent bond, hydrogen and some other simple molecules, carbon compounds, hybridization, Boron and Beryllium compounds.

Coordinate covalent bond, ionic bond as an extreme case of polar covalent bond, ionic character of molecules and polar molecules. Bonding in solid state ionic, molecular and covalent solids, metals). Hydrogen bond, Resonance.

Molecules: Molecular orbital. Theory – bond order and magnetic properties of H2, O2, N2, F2 on the basis of MOT. Hybridisation involving s, p and d orbitals (including shapes of simple organic molecules), Dipole moment and structure of molecules.

**Chemistry of Non-Metals – I:** Hydrogen ( unique position in periodic table, occurrence, isotopes, properties, reactions and uses), Hydrides – molecular, soline and interstitial Oxygen (occurrence, preparation, properties and reactions, uses), simple oxides; ozone. Water and hydrogen peroxide, structure of water molecule and its aggregates, physical and chemical properties of water, hard and soft water, water softening, hydrogen peroxide – preparation, properties, structure and uses. Nitrogen – Preparation, properties, uses, compounds of Nitrogen – Ammonia, Oxides of Nitrogen, Nitric Acid – preparation, properties and uses.

**Chemistry of Non-Metals – II:** Boron – occurrence, isolation, physical and chemical properties, borax and boric acid, uses of boron and its compounds. Carbon, inorganic compounds of carbon – oxides, halides, carbides, elemental carbon. Silicon – occurrence, preparation and properties, oxides and oxyacids of phosphorus, chemical fertililzers. Sulphur – occurrence and extraction, properties and reactions, oxides, Sulphuric acid – preparation, properties and uses, sodium thiosulphate. Halogens – occurrence, preparation, properties, hydrogen halides, uses of halogens. Noble gases – discovery, occurrence and isolation, physical properties, chemistry of noble gases and their uses.

**Chemistry of Lighter Metals:** Sodium and Potassium – occurrence and extraction, properties and uses. Important compounds – NaCl, Na2CO3, NaHCO3, NaOH, KCl, KOH. Magnesium and calcium – occurrence and extraction, properties and uses. Important compounds MgCl2, MgSO4, CaO, Ca(OH)2, CaCO3, CaSO4, plaster of paris, Bleaching Powder. Aluminium – occurrence, extraction, properties and uses, compounds – AlCl3, alums. Cement. Biological role of Sodium, Potassium, Magnesium and Calcium.

**Heavy Metals:** Iron – Occurrence and extraction, compounds of iron, oxides, halides, sulphides, sulphate, alloy and steel. Copper and silver – occurrence and extraction, properties and uses, compounds – sulphides, halides and sulphates, photography. Zinc and Mercury – occurrence and extraction, properties and uses, compounds – oxides, halides; sulphides and sulphates Tin and Lead – occurrence and extraction, properties and uses, compounds – oxides, sulphides, halides.

**Chemistry of Representative Elements:** Periodic properties – Trends in groups and periods (a) Oxides-nature (b) Halides-melting points (c) Carbonates and sulphates – solubility. The chemistry of s and p block elements, electronic configuration, general characteristic properties and oxidation states of the

following:- Group 1 elements – Alkali metals Group 2 elements – Alkaline earth metals Group 13 elements – Boron family Group 14 elements – Carbon family Group 15 elements – Nitrogen family Group 16 elements – Oxygen family Group 17 elements – Halogen family Group 18 elements – Noble gases and Hydrogen.

**Transition Metals including Lanthanides:** Electronic configuration: General characteristic properties, oxidation states of transition metals. First row transition metals and general properties of their compounds-oxides, halides and sulphides. General properties of second and third row transition elements (Groupwise discussion). Preparation and reactions, properties and uses of Potassium dichromate and Potassium permanganate.

**Inner Transition Elements:** General discussion with special reference to oxidation states and lanthanide contraction.

**Coordination Chemistry and Organo Metallics:** Coordination compounds, Nomenclature: Isomerism in coordination compounds; Bonding in coordination compounds, Werner's coordination theory. Applications of coordination compounds.

**Nuclear Chemistry:** Nature of radiations from radioactive substances. Nuclear reactions; Radioactive disintegration series; Artificial transmutation of elements; Nuclear fission and Nuclear fusion: Isotopes and their applications: Radio carbon-dating.

**Purification and Characterization of Organic Compounds:** Purification (crystallization, sublimation, distillation, differential extraction, chromatography). Qualitative analysis, detection of nitrogen, sulphur, phosphorus and halogens. Quantitative analysis – estimation of carbon, hydrogen, nitrogen, halogens, sulphur, phosphorus (basic principles only) Determination of molecular mass – Silver salt method, cholroplatinate salt method, Calculation of empirical formula and molecular formula. Numerical problems in organic quantitative analysis, modern methods of structure elucidation.

Some Basic Principles: Classification of Organic Compounds. Tetravalency of Carbon. Homologous series. Functional groups– –C = C –, – C C – and groups containing halogen, oxygen, nitrogen and sulphur. General introduction to naming organic compounds – Common names and IUPAC nomenclature of alphatic, aromatic and Cyclic Compounds. Illustration with examples of Compounds having not more than three same or different functional groups/atoms. Isomerism – Structural and stereoisomerism (geometrical and optical). Chirality – Isomerism in Compounds having one and two chiral Centres. Enantiomers, diastereoisomers, racemic forms, racemisation & resolution. Covalent bond fission – Homolytic and Heterolytic: free radicals carbocations and carbanions. Stability of Carbocations and free-radicals. Electrophiles and Nucleophiles. Electron displacement in a covalent bond – inductive effect, electromeric effect, resonance. Common types of organic reactions – Substitution, addition, elimination and rearrangement reactions. Illustrations with examples.

**Hydrocarbons:** Classification. Sources of hydrocarbons: Alkanes - General methods of preparation (from unsatmated hydrocarbons, alkylhalides, aldehydes, ketones and carburoxylic acids). Physical properties and reactions (Substitution, oxidation and miscellaneous). Conformations of alkanes(ethane, popane butane) and cyclohexane, sawhorse and Newman projections)– mechanism of halogaration of alkanes. Alkanes and Alkynes - General methods of preparation physical properties, Chemical reactions – Mechanism of electrophilic addition reactions in alkenes – Markowni Koff's Rule, peroxide effect. Acidic character of alkynes. Polymerisation of alkenes. Aromatic hydrocarbons - Benzene and its homologues, Isomerism, Chemical reactions of bonzene. Structure of bonzene, resonance. Directive influence of substituents. Petroleum - HydroCarbons from Petroleum, Cracking and reforming, quality of gasoline – Octane number, gasoline additives.

**Organic Compounds Containing Halogens:** (Haloalkanes and Haloarenes), Methods of preparation, physical properties and reactions, Preparation, properties and uses of Chloroform and Iodoform.

**Organic Compounds Containing Oxygen:** General methods of preparation, correlation of physical properties with their structures, chemical properties and uses of Alchols, polyhydric alcohols, Ethers, aldehydes, ketones, carboxylic acids and their derivatives, Phenol, Benzaldehyde and Benzoic acid – their important methods of preparation and reactions. Acidity of carboxylic acids and phenol effect of substituents on the acidity of carboxylic acids.

**Organic Compounds Containing Nitrogen:** (Cyanides, isocyanides, nitrocompounds and amines) Nomenclature and classification of amines, cyanides, isocyanides, nitrocompounds and their methods of preparation; correlation of their physical properties with structure, chemical reactions and uses – Basicity of amines.

**Synthetic and Natural Polymers:** Classification of Polymers, natural and synthetic polymers (with stress on their general methods of preparation) and important uses of the following: Teflon, PVC, Polystyrene, Nylon-66, Terylene, Bakelite.

**Bio Molecules and Biological Processes:** The Cell and Energy Cycle, Carbohydrates: Monosaccharides, Disaccharides, Polysaccharides, Amino Acids and Peptides – Structure and classification. Proteins and Enzymes – Structure of Proteins, Role of enzymes. Nucleic Acids – DNA and RNA, Biological functions of Nucleic Acids – Protein synthesis and replication, Lipids – Structure, membranes and their functions.

**Chemistry in Action:** Dyes, Chemicals in medicines (antipyretic, analgesic, antibiotics & tranquilisers), Rocket propellants. (Structural formulae non-evaluative)

**Environmental Chemistry:** Environmental pollutants; soil, water and air pollution; major atmospheric pollutants; acid rain, Ozone and its reactions causing ozone layer depletion, effects of the depletion of ozone layer, industrial air pollution.

**ENGLISH**

Reading Comprehension, Diction, Formation of Effective Sentences, Sentence Completion, Vocabulary, Common Errors.