Continual Learning...

Information Brochure

KIITEE 2015
ADMISSION POLICY

Admission to all the courses will be ONLY through KIITEE – 2015
## (ANNEXURE-I)

### EXAMINATION CENTRE FOR KIITEE-2015

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<th>Name of the State / City</th>
<th>Exam. Centre</th>
<th>Date of Examination For B.Tech.(4years)/ B.Tech&amp;M.Tech-Dual Degree(5years)/ B.Tech&amp;MBA-Dual Degree(5 years)/B.Arch. (PCM)</th>
<th>Date of Examination For MBBS/BDS / B.Sc. Nursing/ Biotechnology-Dual Degree (B.Tech / M.Tech) (PCB)</th>
<th>Date of Examination B. Tech. (LE)/ BBA/ BCA/Bachelor of Design (Fashion/Textile) / Bachelor of Film &amp; Television Production/ BA.LLB/ BBA.LLB/ B.Sc.LLB/ B.Arch. MCA / MCA(L.E) M. Tech./ LLM/ M.Sc. (Biotechnology) &amp; M.Sc.(Applied Microbiology)/ M.Sc. Nursing/ Master of Mass Communication/ Ph.D</th>
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N.B.- Dates of the Examination for different centers have been decided according to the number of applicants in previous year. In case of increase in number of applicants in any of the Examination center dates may be extended.
1.0 KIITEE – 2015

1.1 APPLICATION PROCEDURE

Application Form and Prospectus will be available online only. It will not be available in hard copy. Candidates have to apply online at http://www.kiitee.ac.in or http://www.kiit.ac.in or they can download it from the website.

The ‘Online Application Form’ will be accepted after the following steps are completed:

- Browse KIIT web site http://www.kiitee.ac.in or http://www.kiit.ac.in.
- Select ‘Online Application’ / ‘Download’ option. (If you want to download, take the print out of downloaded Application Form’).
- Go through the Instructions to fill up the form.
- Fill up ‘Online Application Form’ and submit.
- Take the print out of Registration Form mentioning the Application Number.
- Paste the Photographs in the space provided for it.
- Sign on ‘Signature’ columns both by candidate and parent/guardian.
- Dispatch the Form along with two passport size color photographs pasted in appropriate place and 10th Pass Certificate / Mark sheet.

Candidates should retain photocopies of ‘printed application form’ which may serve as reference for future correspondence.

The online application will be accepted subject to receipt of printed application, photographs, copy of 10th Pass Certificate / Mark sheet only.

For downloaded application form

The candidates have to fill up all the fields very carefully and send it with the photographs and 10th Pass Certificate / Mark sheet.

The print out of online registration form or filled in downloaded application form should be submitted in person / by post (Registered Post / Speed Post / Courier) to “The Director, Admissions, KIIT University, Koel Campus, Bhubaneswar - 751024, Odisha, India” so as to reach on or before dt. 25.03.2015, 5.00 p.m.

Information on receipt of applications at KIIT will be available in the website http://www.kiitee.ac.in & http://www.kiit.ac.in. Candidates can check status of their Application Form on the website after 20 days of its dispatch to KIIT.

1.2 ADMIT CARD

The Admit Cards will be hosted in the website from dt.31.03.2015 to dt.05.04.2015. In case, the Admit Card is not available in the website within 6th April, 2015, candidates should write/contact KIIT between 7th April, 2015 to 10th April, 2015 giving details of the Post Office, date of dispatch, receipt of postal dispatch, Photocopy of the Application Form, one photograph, photocopy of 10th Pass Certificate / Mark sheet. The candidates have to download the admit card from the website and have to come with the printed copy to the examination Centre. Admit Cards will not be dispatched in Hard Copy.

Candidates must preserve the Admit Card till the admission process is over.

1.3 CALENDAR OF EVENTS

<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apply Online</td>
<td>02-12-2014 to</td>
</tr>
<tr>
<td></td>
<td>20-03-2015</td>
</tr>
<tr>
<td>Last date of receiving Filled in Application form</td>
<td>25-03-2015</td>
</tr>
<tr>
<td>Last date of hosting Admit Card in the website</td>
<td>05-04-2015</td>
</tr>
<tr>
<td>Date of Entrance Examination (Online) (Annexure-I)</td>
<td>21-04-2015 to</td>
</tr>
<tr>
<td></td>
<td>30-04-2015</td>
</tr>
<tr>
<td>Declaration of Result</td>
<td>15-05-2015</td>
</tr>
<tr>
<td>Counseling</td>
<td>02-06-2015 to</td>
</tr>
<tr>
<td></td>
<td>15-06-2015</td>
</tr>
</tbody>
</table>

Detailed Counseling Scheduled will be declared after publication of result on 15th May 2015.
2.0 ENTRANCE EXAMINATION PROCEDURE

2.1 Rules and Regulation

You are going to take a computer based online Test at a workstation.

You are required to be present in the Test Centre 45 minutes before the starting time of the Test as specified in the admit card.

The Proctor will announce commencement and completion of the Examination. Candidates should leave their seat on hearing announcement of completion.

The candidate must show, on demand, the valid Admit Card for admission into the Examination Hall. A candidate, without a valid Admit Card, will not be permitted to enter the Examination Hall under any circumstances.

A seat indicating application number will be allotted to each candidate. Candidates should find out and occupy their allotted seats only. The candidature of a candidate, found to have changed Hall or seat on his/her own, shall be cancelled and no plea would be accepted.

Candidates are not allowed to carry any Textual, Material, Calculator, Slide Rule, Log Table, Electronics Watch, Printed or Written Material, Papers, Mobile Phone, Pager or any other device except the Admit Card and Pen/Pencil inside the Examination Hall.

No candidate, without the permission of the Centre Superintendent/ proctor can leave his/her seat or Examination Hall till the completion of the Examination.

Smoking in the Examination Hall is strictly prohibited.
Tea coffee, cold drinks or snacks are not allowed inside the Examination Hall.

Registration of candidates

Candidates cleared by security person immediately report to Registration desk:

(a) Candidate produces the hall ticket.
(b) Individual’s identification verified with the photograph/identity proof.

(c) On verification of identity, admit card scanned, photograph of the candidate and finger prints of left & right thumb captured, a Computer Number is allotted and directed to the computer lab.

(d) Candidate proceeds to the allotted computer to take the examination.

Computer Based Test

Candidate enters the Computer lab:

1. Proctor guides the candidate to the allotted computer.
2. The computer will be showing a welcome screen.
3. Candidate will be provided with a sheet of paper for rough work.
4. The candidate waits for Start of Test.
5. Candidates briefed on the examination process.
6. Candidate logs in by entering the password given in the admit card, goes through the instructions and waits for the administrator to start the test.
7. Technical in charge initiates the ‘Start of Test’, which refreshes the screens and enables candidates to start the test.
8. The candidate starts answering the questions and the timer starts. The individual cannot take any break before completion of the test.
9. Takes the Test, and in case of any doubt with regard to the test raises hand to draw the attention of proctor for help.
10. In case the candidate finishes the test before allotted time, he/she gets a confirmation page which will give two options; either to go back to the test or to complete the test.
11. In case candidate wants to review the answers in the remaining time he/she can do so else they may complete the test and submit.
12. Once the candidate completes the on-line test, he/she should be able to see the screen indicating completion of test with a thank you note.
INFORMATION ON THE TEST

- In each of these sections, every question is followed by 4 answer options. Choose the option that is most appropriate. Indicate your answer by clicking on the circle adjacent to the option you think is right.

- You can go to any question directly by clicking on the question number, which will appear at the bottom of the screen. The answered question number will be marked Green and the unanswered/ skipped question number will remain in blue.

- If you are doubtful of the answer, you can mark a question for review using the ‘Mark for review button’. This will be unmarked once you come back to the same question at a later time and change the answer.

- If you want to change the answer of any question, you may select the question and change the answer by clicking on the appropriate answer.

- Each correct answer fetches 4 marks.

- There is negative marking. 1 mark will be deducted for every wrong answer.

- If you have completed answering all the questions in the sequence of a particular section, you will be automatically directed to the first question of the next section.

- You can move between sections at your will.

- The test closes automatically once the allotted time of 180 Minutes are over.

- In case you finish your test before allotted time, you will get a confirmation page which will give you two options. Either to go back to the test or to complete the test.

- In case you want to review the answers in the remaining time you can do so, else you may complete the test and submit. **Ensure that you click on submit as a sign of completion.**

2.2 UNFAIR MEANS

Candidates shall maintain perfect silence and attend to their Question only. Any conversation or gesticulation or disturbance in the Examination Hall shall be deemed as misbehavior. If a candidate is found using unfair means or impersonating, his/her candidature shall be cancelled and will be debarred from the Examination.

2.3 Non Attendance

For those unable to appear in Entrance Examination on scheduled date of Examination for any reason, no re-examination shall be held under any circumstance. The schedule will remain unchanged even if the date is declared as a public holiday.

2.4 Language of the Question Paper

Language of the questions will be in English. The questions will not be in any other language.

3.0 Eligibility Criteria

UNDERGRADUATE COURSES

3.1 For B.Tech. (4years)/B.Tech&M.Tech-Dual Degree (5years)/B.Tech&MBA-Dual Degree (5years) Course :-

Candidates applying for B.Tech,(4years),B.Tech& M.Tech - Dual Degree (5years) & B.Tech&MBA-Dual Degree(5 years) Course should fulfill the following criteria.

I. Candidates who have passed 10+2 examination in 2013,2014 or appearing in 10+2 examination in 2015 are only eligible to apply for B.Tech (4 years), B.Tech & M.Tech- Dual Degree (5 years), B.Tech & MBA- Dual Degree (5years) course of the University.

II. Should have studied in regular full time formal education in their schooling / college.

III. Pass in 10+2 or its equivalent with at least 60% marks in Physics, Chemistry and Mathematics taken together.

IV. B.Tech & M.Tech. (Dual Degree) Biotechnology. Pass in 10+2 or equivalent with at least 60% marks in Physics, Chemistry and Mathematics/Biology/Biotechnology taken together.

V. Should have born on or after 01.07.1994.
3.2 For B.Tech. -LE (3 years): Pass in three years diploma course in Engineering with at least 60% marks in aggregate from State Council of Technical Education of any state or equivalent. Candidate should have born on or after 01.07.1991.

<table>
<thead>
<tr>
<th>Course wise Eligibility Criteria B.TECH (L.E)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>For Admission Into Following Branches</strong></td>
</tr>
<tr>
<td>Civil Engg.</td>
</tr>
<tr>
<td>Mechanical Engg./Automobile Engg.</td>
</tr>
<tr>
<td>Electrical Engg.</td>
</tr>
<tr>
<td>Computer Science &amp; Engg./ Information Technology</td>
</tr>
</tbody>
</table>

3.3 For B.Tech in Architecture (5 years): A pass in (10+2) examination from a recognized board or its equivalent subject to securing 60% marks in aggregate with mathematics as a subject at the higher secondary level and a pass in the National Aptitude Test in Architecture (NATA) conducted by the Council of Architecture (CoA), New Delhi either in 2014 or 2015. Should have born on or after 01.07.1994.

3.4 For MBBS/BDS: 10+2 pass with Physics, Chemistry, Biology & English with at least 50% marks in Physics, Chemistry & Biology taken together for general category candidates and 40% marks in Physics, Chemistry & Biology taken together for SC/ST Candidates. Age: Lower age should be 17 years as on 31.12.15 & upper age limit should be maximum 25 years as on 31.12.15. The upper age limit may be relaxed by five years for SC/ST candidates.

3.5 For B.Sc. Nursing (4 years): Pass in 10+2 or equivalent examination with Physics, Chemistry & Biology and English (PCBE) with at least 45% marks in aggregate. Age: Lower age should be 17 years as on 31.12.15 & upper age limit should be maximum 35 years as on 31.12.15.

3.6 For B.A. LL.B/BBA LL.B/B.Sc LL.B (5 years): 10+2 pass or equivalent in any stream with at least 45% marks. For B.Sc. LL.B candidates should have passed 10+2 or equivalent in the science stream with at least 45% marks. Age: Not completed 21 years of age as on 01.07.15.

3.7 For BBA (3 years): Pass in 10+2 in any stream with at least 50% marks and having Mathematics / Business Mathematics / Economics / Statistics as one of the subjects in 10+2 level. Should have born on or after 01.07.1994.

3.8 For BCA (5 years): Pass in 10+2 in any stream with at least 50% marks and having Mathematics as one of the subjects in 10+2 level. Should have born on or after 01.07.1994.

3.9 For Bachelor of Design (Fashion/Textile) (4 years): Pass in 10+2 or equivalent examination from a recognized Central / State Board with 50% marks in aggregate. Should have born on or after 01.07.1994.

3.10 For Bachelor of Film & Television Production (3 years): Pass in 10+2 or equivalent examination from a recognized Central / State Board with 50% marks in aggregate. Should have born on or after 01.07.1994.
3.11 A candidate who has passed IB Diploma from International Baccalaureate Organization, Geneva, Switzerland are eligible to take admission in all the courses where 10+2 is the eligibility qualification. Other criteria of the eligibility remain as applicable.

POST GRADUATE COURSES

3.12 For MCA/MCA(L.E) (2 years): Any Graduate with minimum 50% marks in graduation or equivalent having mathematics either in 10+2 or graduation level as one of the subject. Candidate should have born on or after 01.07.1991.

3.13 For M.Tech. (2 years): B.E. or B.Tech. or equivalent Degree (e.g. AMIE, GRADE-IETE etc) in respective branches of Engineering and Technology with a First Class or equivalent CGPA or First Class MCA / First Class M.Sc. in (Comp/IT/ETC)

GATE qualified candidates shall be accorded preference in the process of selection. GATE qualified candidates having Score 400 or above need not sit in the entrance Examination.

Course wise Eligibility Criteria (M.Tech. (2Years):-


Computer Science & Engineering:-

Computer Science Engineering/Computer Science & Information Security/Data Analytics/Software Engineering:

First Class B.E. / B.Tech. or equivalent in Computer Science, Information Technology, Electronics & Electrical, Electrical & Electronics, Electrical & Tele-Comm., Electronics & Instrumentation or First Class in MCA or First Class in M.Sc. Comp.Sc./Information Technology.

Electronics & Tele-CommunicationEngg:-


Civil - Construction Engineering & Management/Structural Engineering: First Class B.E./B.Tech. or equivalent in Civil Engineering.

3.14 M.Sc. (Biotechnology/Applied Microbiology) (2Years):- Bachelor’s degree in any branch of Science/ Agriculture/ Pharmacy/ Veterinary / Engineering / Technology / Medicine (MBBS/BDS) with at least 55% marks. Candidate should have been born on or after 01.07.1991.

3.15 M.Sc. Nursing (2Years): Candidate should be a registered Nurse or Registered midwife or equivalent with any state Nursing Registration Council. The minimum education requirement shall be passing of B.Sc.Nursing/B.Sc.Hons.Nursing/Post Basic B.Sc Nursing with Minimum of 55% aggregate marks.(5% relaxation of marks for SC/ST candidates)

The candidate should have undergone B.Sc.Nursing/B.Sc.Hons.Nursing/PostBasic B.Sc.Nursing in an institution which is recognized by Indian Nursing Council. Minimum one year of work experience after Basic B.Sc Nursing. Candidate should be medically fit.

3.16 For LL.M (1Year) Candidate should have passed B.A.LLB/BBA LLB/B.Sc.LLB/B.L, degree or an equivalent degree from recognized university and must have secured at least 55% of marks in aggregate

3.17 For Master of Mass Communication(2 years) Any Graduate with minimum 50% marks.

RESEARCH PROGRAMME

3.18 For Ph.D-Candidate having M.Tech /ME/ MCA/MBA or equivalent Degree with minimum 60% marks or an equivalent CGPA or M.Sc./MA/M.Com/LLM or an equivalent degree with minimum of 55% marks or an equivalent.

For all the courses, candidates appearing in the qualifying examination can also apply. But, they have to produce the pass certificate of the qualifying examination on the day of counseling failing which their rank/position secured in the entrance Examination will stand cancelled automatically and they will have no claim for the admissions as per the rank.
4.0 EVALUATION AND DECLARATION OF RESULTS

Results of KIITEE-2015 will be declared on 15.05.2015. On the basis of marks secured by the candidate in Entrance Examination, separate Merit lists will be prepared for B.Tech, B.Tech & M.Tech Dual Degree, B.Tech & MBA Dual Degree / B.Arch. / B.Tech. (LE), MBBS / BDS / B.Sc. Nursing / BBA / BCA / B.ALL.B / B.BA.LLB / B.Sc.LLB, Bachelor of Design (Fashion / Textile), Bachelor of Film & Television Production, Biotechnology- Dual Degree (B.Tech / M.Tech) Programme. Courses like M.Tech, LL.M, MCA, MCA(LE) M.Sc. (Biotechnology / Applied Microbiology), Master of Mass Communication, Ph.D. A cut-off qualifying mark will be fixed by the University, at the time of declaration of Entrance Result. Result will be published through University Websites. The candidates can see their result by giving their application number/roll number. Rank Card indicating the Rank in Entrance Examination, shall be sent to the qualified candidates. Candidates can download the rank card from the website.

As per the availability of seats in different courses, cut-off Rank for counseling will be notified. Candidates, having rank above cut-off rank, shall be called for counseling.

In case of two or more candidates obtaining equal marks, inter-se merit of such candidates shall be determined as follows:-

B.Tech/B.Tech & M.Tech (Dual Degree) & B.Tech & MBA (Dual Degree):- On the basis of marks obtained in Mathematics, then in Physics and then by age (preference to older candidates).

B.Arch.: - On the basis of marks obtained in NATA.

B.Tech. (LE):- On the basis of marks obtained in Mathematics then in Basic Electrical Engineering and then by age. (Preference to older candidate).

MBBS/BDS/B.Sc. Nursing: - On the basis of marks obtained in Biology, then in Chemistry and then by age (Preference to older candidate).

BBA/BCA/Bachelor in Design (Fashion/Textile)/Bachelor in Film & Television Production/BA.LLB/BBA LLB/B.Sc.LLB: - On the basis of Marks obtained in Mathematical Ability, then in Analytical Ability, then in English and then by age. (Preference to older candidate)

Biotechnology- Dual Degree (B.Tech/M.Tech)(5 years):- On the basis of marks obtained in Biology, then in Chemistry and then by age (preference to older candidate).

MCA/MCA(LE): - On the basis of the marks obtained in Computer Awareness, then Mathematics and then by age (Preference to older candidate)

M.Tech: - Preference to Older Candidates

M.Sc. (Applied Microbiology/Biotechnology): - On the basis of marks obtained in Biology, then Chemistry, then Mathematics and then by age. (Preference to Older Candidates)

LLM: - Preference to Older Candidates

Master of Mass Communication: - Preference to Older Candidates.

5.0 COUNSELING, SEAT ALLOCATION, DOCUMENT VERIFICATION AND ADMISSION

Counseling and seat allocation will be purely on merit basis i.e. based on the performance in the Entrance Examination.

Counseling Schedule will be published in the KIIT Website on the day of declaration of result itself. Candidates have to attend the counseling as per the schedule.

Counseling will be stopped as soon as all the seats reserved for the KIITEE-2015 are filled up.

Verification of documents would be done at the time of counseling / admission. So as to verify records on identification, age, qualifying examination and category of candidates. On failing to establish correctness in any of the documents, the candidates will not be considered for admission.

Candidates, called for Counseling must bring Original Documents (listed below) and token Fees to the Counseling Centre.

1. Admit Card
2. Rank Card
3. 10th Pass Certificate
4. 12th Mark sheet and Pass Certificate
5. Graduation Mark sheet and Pass Certificate only for MCA, MCA(LE), Master of Mass Communication, M.Sc. (Biotechnology/ Applied Microbiology)
6. Diploma Pass Certificate and three years Mark Sheet (for Lateral Entry Candidates)
7. B.Tech./B.E./ MCA/ M.Sc. or Equivalent Degree Certificate (For M.Tech./LLM/Ph.D Candidates)
8. Relevant Certificate issued by the Competent Authority, clearly indicating the Reservation Criteria claimed by the candidate.
9. GATE Score Card (for M.Tech. GATE Qualified only)
10. School/College Leaving Certificate
11. Conduct Certificate
12. Demand Draft of Rs. 62, 000/- which includes the counseling registration fees of Rs.6,000 in favor of KIIT, payable at Bhubaneswar. Balance fee as per the fee structure is to be paid on the day of reporting.

6.0. RESERVATION OF SEATS

The KIITEE-2015 Quota Seats are distributed among different categories of candidates as follows. Separate Merit list will be prepared for each Category.

<table>
<thead>
<tr>
<th>Reservation Category</th>
<th>% of seats</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scheduled Caste (SC)</td>
<td>15%</td>
</tr>
<tr>
<td>Scheduled Tribe (ST)</td>
<td>7.5%</td>
</tr>
<tr>
<td>Physically Challenged (PC)</td>
<td>3%</td>
</tr>
</tbody>
</table>

Physically Challenged: Candidates will be considered eligible for admission under PC Category, who are having 40% disabilities in consonance with Section-39 of the Persons with Disabilities (Equal Participation) Act, 1995. As the institution is not having adequate facilities, the candidates having locomotory disabilities are only eligible to apply KIITEE- 2015.

Categories of Candidates

- General : GE
- Scheduled Caste : SC
- Scheduled Tribe : ST
- Physically Challenged: PC

15% & 7.5% seats of KIITEE-2015 quota seats will be reserved for Schedule Caste & Scheduled Tribe (by birth) respectively. (Not by adoption or marriage)

3% seats of KIITEE-2015 will be reserved for PC candidates. (Only locomotory disabilities). Physically Challenged Candidates and capable of undergoing Engineering/MCA course at KIIT University as per the facilities available.

30% seats of each category will be reserved for women candidate (only applicable for B.Tech/B.Tech & M.Tech (Dual Degree)/B.Tech & MBA (Dual Degree).

All the unfilled reserved seats will be converted to General Category.

7.0 Legal Jurisdiction

All disputes pertaining to the conduct of KIITEE-2015 shall fall within the jurisdiction of Bhubaneswar only. If any person or officer engages himself/herself in act(s) that would result in the leakage of the question paper(s) or attempt to use or help in the use of unfair means in this Examination, he/she shall be liable to prosecution under the Indian Penal Code.
<table>
<thead>
<tr>
<th>Course</th>
<th>Subjects</th>
<th>No. of Questions</th>
<th>Syllabus</th>
</tr>
</thead>
<tbody>
<tr>
<td>B.Tech.(4 years)/B.Tech&amp;M.Tech-Dual Degree(5 years)/B.Tech&amp;MBA-Dual Degree(5 years)/B.Arch.(Science Group)</td>
<td>PCM (10+2 standard)</td>
<td>Physics</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chemistry</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mathematics</td>
<td>40</td>
</tr>
<tr>
<td>MBBS/BDS/B.Sc Nursing/ Biotechnology- Dual Degree(B.Tech/M.Tech)</td>
<td>PCB (10+2 standard)</td>
<td>Physics</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chemistry</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Biology</td>
<td>90</td>
</tr>
<tr>
<td>B.Tech.(Lateral Entry) (3 years)</td>
<td>Mathematics</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Basic Electrical Engineering</td>
<td>40</td>
<td>The detail Syllabus is given in the Appendix-III</td>
</tr>
<tr>
<td></td>
<td>Engineering Mechanics</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>BBA/BCA/ Bachelor of Design (Fashion/Textile)/ Bachelor of Film &amp; Television Production/BA LLB/ BBA LLB/BSc LLB/B.Arch.(Other Group)</td>
<td>Mathematical Ability</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Analytical &amp; Logical Ability</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Verbal Ability</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td></td>
<td>General Ability</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>MCA/MCA( Lateral Entry)</td>
<td>Mathematics(10+2 Standard)</td>
<td>60</td>
<td>The detail Syllabus is given in the Appendix-IV</td>
</tr>
<tr>
<td></td>
<td>Analytical &amp; Logical Ability</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Computer Awareness</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>M.Tech.(2 years)</td>
<td>Branch Specific</td>
<td>120</td>
<td>The questions will be pertaining to the B.E/B.Tech. Syllabus of concerned discipline</td>
</tr>
<tr>
<td>LLM</td>
<td>Multiple Choice questions</td>
<td>120</td>
<td>The questions will be pertaining to LLB Syllabus</td>
</tr>
<tr>
<td>M.Sc.(Biotechnology) &amp; M.Sc.(Applied Microbiology)(2 years)</td>
<td>Biology(10+2+3 Standard)</td>
<td>50</td>
<td>The detail Syllabus is given in the Appendix-V</td>
</tr>
<tr>
<td></td>
<td>Chemistry(10+2 Standard)</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mathematics(10+2 Standard)</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Physics(10+2 Standard)</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>M.Sc Nursing</td>
<td>B.Sc Nursing</td>
<td>120</td>
<td>The questions will be pertaining to the B.Sc Nursing Syllabus.</td>
</tr>
<tr>
<td>Master of Mass Communication</td>
<td>English</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td></td>
<td>General Awareness</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>Ph.D.</td>
<td>Teaching and Research Aptitude</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Subject Specific</td>
<td>60</td>
<td></td>
</tr>
</tbody>
</table>
(APPENDIX-I)

SYLLABUS FOR B.TECH. (4 YEARS)/B.TECH&M.TECH-DUAL DEGREE
(YEARS)/B.TECH.&MBA-DUAL DEGREE(YEARS) & BIOTECHNOLOGY- DUAL DEGREE
(B.TECH / M.TECH)

PHYSICS

Unit 1: Units and Measurement

Units for measurement, system of units-S.I., fundamental and derived units. Dimensions and their applications.

Unit 2: Description of Motion in One Dimension

Motion in a straight line, uniform and non-uniform motion, their graphical representation. Uniformly accelerated motion, and its application.

Unit 3: 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.

Unit 4: Laws of Motion


Unit 5: 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.

Unit 6: 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.

Unit 7: 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.

Unit 8: 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.

Unit 9: Oscillations

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

Unit 10: 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 effects.
Unit 11: Heat and Thermodynamics

Unit 12: Transference of Heat

Unit 13: 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.

Unit 14: 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.

Unit 15: 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.

Unit 16: Magnetic Effects of Currents
Oersted’s experiment, Bio-Savert’s law, magnetic filed due to straight wire, circular loop and solenoid, force on a moving charge in a uniform magnetic field (Lorentz force), force and torques on currents in a magnetic field, force between two current carrying wires, moving coil galvanometer and conversion to ammeter and voltmeter.

Unit 17: 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.

Unit 18: 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.

Unit 19: 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.

Unit 20: Wave Optics
Wave nature of light; Interference- Young’s double slit experiment. Diffraction-diffraction due to a single slit. Elementary idea of polarization.

Unit 21: Electromagnetic Waves
Electromagnetic waves and their characteristics, Electromagnetic wave spectrum from gamma to radio waves-propagation of EM waves in atmosphere.

Unit 22: Electron and Photons
Charge on an electron, e/m for an electron, photoelectric effect and Einstein’s equation of photoelectric effect.

Unit 23: 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.

**Unit 24: 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**

**Unit 1: Some Basic Concepts:**


**Unit 2 : 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 dielectric properties of solids. Liquid state (Properties of liquids, Vapour pressure, Surface tension, Viscosity).

**Unit 3: Atomic Structure**

 Constituents of the atom (discovery of electron, rutherford model of the atom).

Electronics structure of atoms—nature of light and electromagnetic waves, atomic spectra, bohr’s model of hydrogen, shortcomings of the bohr model.


**Unit 4: Solutions**


**Unit 5: 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.

**Unit 6: 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 Chatelier’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.

Unit 7: Redox Reactions and Electrochemistry

Oxidation and reduction as an electron transfer concept. Redox reactions in aqueous solutions-electrochemical cells. e.m.f. of a galvanic cell. Dependence of e.m.f. 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.


Unit 8: 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 of 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 constant. 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.

Unit 9: Surface Chemistry

Surface : Adsorption – physical and chemical adsorption, adsorption isotherms.

Colloids—Preparation and general properties, Emulsions, Micelles.

Catalysis : Homogeneous and heterogeneous, structure of catalyst, Enzymes, Zeolites.

Unit 10: Chemical Families Periodic Properties


Unit 11: 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.


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.

Unit 12: Chemistry of Non-Metals - 1

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.

**Unit 13: 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 fertilizers.

Sulphur – occurrence and extraction, properties and reactions, oxides, Sulphuric acid – preparation, properties and uses, sodium thiosulphate.

Halogen- occurrence, preparation, properties, hydrogen halides, uses of halogens.

Noble gases- discovery, occurrence and isolation, physical properties, chemistry of noble gases and their uses.

**Unit 14: 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.

**Unit 15: 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.

**Unit 16: 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, electronics 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 & Hydrogen

**Unit 17: 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 a second and third row transition elements ( Groupwise discussion).

Preparation and reactions, properties and uses of Potassium dichromate Potassium permanganate.

Inner Transition Elements: General discussion with special reference to oxidation states and lanthanide contraction.
Unit 18: Coordination Chemistry and Organo Metallics

Coordination compounds, Nomenclature: Isomerism in coordination compounds; Bonding in coordination compounds, Werner's coordination theory. Applications of coordination compounds.

Unit 19: Nuclear Chemistry

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

Unit 20: Purification and Characterisation 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, chloroplatinate salt method

Calculation of empirical formula and molecular formula.

Numerical problems in organic quantitative analysis, modern methods of structure elucidation.

Unit 21: 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 aliphatic, aromatic and Cyclic Compounds. Illustration with examples of Compounds having not more than three same of different functional groups/ atoms. Isomerism- Structural and stereoisomerism (geometrical and optical). Chirality-Isomerism in Compounds having one and two chiral Centres. Enantiomers, diastereoisomers, recemic forms, recemisation & resolution.


Electron displacement in a covalent bond-inductive effect, electromeric effect, resonance

Common types of organic reactions-Substitution, addition, elimination and rearrangement reactions. Illustration with examples.

Unit 22: Hydrocarbons


Petroleum – Hydro Carbons from Petroleum, Cracking and reforming, quality of gasoline-Octane number, gasoline additives.

Unit 23: Organic Compound Containing Halogens

( Haloalkanes and Haloarenes)

Methods of preparation, physical properties and reactions. Preparation, properties and uses of Chloroform and lodoform.
Unit 24: Organic Compounds Containing Oxygen

General methods of preparation, correlation of physical properties with their structures, chemical properties and uses of Alcohols, 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.

Unit 25: 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.

Unit 26: Synthetic and Natural Polymers

Classification on 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)

Unit 27: 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.

Unit 28: Chemistry In Action

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

Unit 29: 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.

MATHEMATICS

Unit 1: 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.

Unit 2: 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.

Unit 3: 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.
Unit 4: 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.

Unit 5: 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.

Unit 6: Mathematical Induction and Its Application

Unit 7: 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.

Unit 8: Sequences and Series


Unit 9: 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.

Unit 10: Integral Calculus


Unit 11: 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, and those of the type

\[ \frac{dy}{dx} = f(x) \]

Unit 12: Two Dimensional Geometry

Recall of Cartesian system of rectangular co-ordinates in a plane, distance formula, area of a triangle, condition of the collinearity of three points and section formula, centroid and incentre 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 line, 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, orthocenter 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 a 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 conditions 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.

**Unit 13: 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.

**Unit 14: 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.

**Unit 15: 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.

**Unit 16: Probability**

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

**Unit 17: Trigonometry**

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

**Unit 18: Statics**

Introduction, basis 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.

**Unit 19: 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
APPENDIX-II
SYLLABUS FOR MBBS/BDS/B.SC.NURSING/BIOTECHNOLOGY-DUAL DEGREE(B.TECH&M.TECH)

PHYSICS

Unit : 1 Introduction and Measurement

What is Physics? Scope and excitement; Physics in relation to science, society and technology; Need for measurement of physical quantities, units for measurement, systems of units-SI : fundamental and derived units. Dimensions of physical quantities. Dimensional analysis and its applications. Orders of magnitude, Accuracy and errors in measurement – random and instrumental errors, Significant figures and rounding off the numbers. Graphs, Trigonometric functions, Concepts of differentiation and integration.

Unit : 2 Description of Motion in One Dimension

Objects in motion in one dimension, Motion in straight line, Uniform and non-uniform motion, its graphical representation and formulae, speed and velocity, relative velocity, average speed and instantaneous velocity. Uniformly accelerated motion, velocity-time graph, position-time graph and their formulae. Relations for uniformly accelerated motion with examples. Acceleration in onedimensional motion.

Unit : 3 Description of Motion in Two and Three Dimensions

Vectors and scalars quantities, vectors in two and three dimensions, vector addition and multiplication by a real number, null-vector and its properties. Resolution of a vector in a plane, rectangular components. Scalar and vector products. Motion in two dimensions, cases of uniform velocity and uniform acceleration-projectile motion, general relation among position-velocity-acceleration for motion in a plane and uniform circular motion. Motion of objects in three dimensional space (elementary ideas).

Unit : 4 Laws of Motion

Force and inertia, first law of motion. Momentum, second law of motion, impulse, examples of different kinds of forces in nature. Third law of motion, conservation of momentum, rocket propulsion. Equilibrium of concurrent forces. Static and kinetic frictions, laws of friction, rolling friction, lubrication, Inertial and non-inertial frames (elementary ideas).

Unit : 5 Work, Energy and Power

Work done by a constant force and by a variable force, unit of work, energy and power. Work Energy Theorem. Elastic and in-elastic collisions in one and two dimensions. Notions of potential energy, conservation of mechanical energy : gravitational potential energy, and its conversion to kinetic energy, potential energy of a spring. Conservative forces. Different forms of energy, mass-energy equivalence, conservation of energy.

Unit : 6 Rotational Motion

Centre of mass of a two-particle system, momentum conservation and centre of mass motion. Centre of mass of rigid body,
general motion of a rigid body, nature of rotational motion, rotational motion of a single particle in two dimensions only, torque, angular momentum and its geometrical and physical meaning, conservation of angular momentum, examples of circular motion (car on a level circular road, car on banked road, pendulum swinging in a vertical plane). Moment of inertia, its physical significance, moment inertia of uniform bodies with simple geometrical shapes, parallel axis and perpendicular axis theorem (statements only). Comparison between translatory (linear) and rotational motion.

**Unit : 7 Gravitation**

Acceleration due to gravity, one and two dimensional motion under gravity. Universal law of gravitation, inertial and gravitational mass, variations in the acceleration due to gravity of the earth, statement of Kepler’s laws of planetary motion, orbital velocity, geostationary satellites, gravitational potential, gravitational potential energy near the surface of earth, escape velocity, weightlessness.

**Unit : 8 Heat and Thermodynamics**


**Unit : 9 Oscillations**

Periodic and oscillatory motions. Simple harmonic motion (S.H.M.) and its equation of motion. Oscillations due to a spring, kinetic energy and potential energy in S.H.M., Simple pendulum, physical concepts of forced oscillations, resonance and damped oscillations; Simple examples.

**Unit : 10 Waves**

Longitudinal and transverse waves and wave motion, speed of progressive wave. Principle of superposition of waves; reflection of waves, harmonic waves (qualitative treatment only), standing waves. Normal modes and its graphical representation. Beats, Doppler effect.

**Unit : 11 Electrostatics**

Frictional electricity, charges and their conservation, unit of charge, Coulomb’s law, dielectric constant, electric field, electric field due to a point charge, electric potential – its physical meaning, potential due to a di-pole, di-pole field and behaviour of dipole in a uniform (2-dimensional) electric field. Flux, Statement of Gauss’s theorem and its applications to find electric field due to uniformly charged simple systems. Conductors and insulators, presence of free charges and bound charges inside a conductor, Capacitance (parallel plate), Dielectric material and its effect on capacitance (concept only), capacitances in series and parallel, energy of a capacitor. Van de Graff generator.

**Unit : 12 Current Electricity**

Introduction (flow of current), sources of e.m.f., cells : simple, secondary, chargeable,
combinations of cells in series and parallel. Electric current, resistance of different materials, temperature dependence, thermistor, specific resistivity, colour code for carbon resistors. Ohm’s law and its limitation. Superconductors (elementary ideas). Kirchoff’s laws, resistances in series and parallel, Wheatstone’s bridge, measurement of resistance. Potentiometer – measurement of e.m.f. and internal resistance of a cell.

Unit : 13 Thermal and Chemical Effects of Currents


Unit : 14 Magnetic Effect of Currents

Oersted’s observation, Biot-Savart’s law (magnetic field due to an element of current), magnetic field due to a straight wire, circular loop and solenoid. Force on a moving charge in a uniform magnetic field (Lorentz force), cyclotron (simple idea), forces and torques on currents in a magnetic field, forces between two currents, definition of ampere, moving coil galvanometer, ammeter and voltmeter. Conversion of galvanometer into voltmeter/ammeter.

Unit : 15 Magnetism

Bar magnet (comparison with a solenoid), magnetic lines of force, torque on a bar magnet in a magnetic field, earth’s magnetic field as a bar magnet, tangent galvanometer, vibration magnetometer. Para, dia and ferromagnetic substances with examples (simple idea). Electromagnets and permanent magnets.

Unit : 16 Electromagnetic Induction and Alternating Currents


Unit : 17 Electromagnetic Waves (Qualitative Treatment)

Electromagnetic oscillations, brief history of electromagnetic waves (Maxwell, Hertz, Bose, Marconi). Electromagnetic spectrum (radio, micro-waves, infra-red, optical, ultraviolet, X-rays, gamma rays) including elementary facts about their uses, propagation of electromagnetic waves in atmosphere.

Unit : 18 Ray Optics and Optical Instruments


Unit : 19 Electrons and Photons

Discovery of electron, e/m for an electron, electrical conduction in gases, photoelectric effect, particle nature of light, Einstein’s
photoelectric equation, photocells. Matter waves – wave nature of particles, de-Broglie relation, Davison and Germer experiment.

**Unit : 20 Atoms, Molecules and Nuclei**

Rutherford model of the atom, Bohr model, energy quantization. Hydrogen spectrum. Composition of nucleus, atomic masses, binding energy per nucleon of a nucleus, its variation with mass number, isotopes, size of nucleus. Radioactivity : properties of α, β and γ rays. Mass energy relation, nuclear fission and fusion.

**Unit : 21 Solids and Semiconductor Devices**

Crystal structure-Unit cell; single, poly and liquid crystals (concepts only). Energy bands in solids, difference between conductors, insulators and semi-conductors using band theory. Intrinsic and extrinsic semiconductors, p-n junction, semiconductor diodes, junction transistor, diode as rectifier, solar cell, photo diode, LED, Zener diode as a voltage regulator, transistor as an amplifier and oscillator. Combination of gates. Elementary ideas about IC.

**CHEMISTRY**

**Unit : 1 Some basic concepts in Chemistry**

Importance of Chemistry, physical quantities and their measurement in Chemistry, SI Units, uncertainty in measurements and use of significant figures, Unit and dimensional analysis, Matter and its nature, laws of chemical combinations, atomic, and molecular, masses mole concept, molar masses, percentage composition and molecular formula, chemical stoichiometry.

**Unit : 2 States of matter**

Three states of matter, gaseous state, gas laws (Boyle’s Law and Charles Law), Avogadro’s Law, Graham’s Law of diffusion, Dalton’s law of partial pressure, ideal gas equation, Kinetic theory of gases, real gases and deviation from ideal behaviour, van der Waals’ equation, liquefaction of gases and critical points, Intermolecular forces; liquids and solids.

**Unit : 3 Atomic structure**

Earlier atomic models (Thomson’s and Rutherford), emission spectrum of hydrogen atom, Bohr’s model, of hydrogen atom, Limitations of Bohr’s model, dual nature of matter and radiation, Heisenberg uncertainty principle, quantum mechanical model of atom (quantum designation of atomic orbitals and electron energy in terms of principal, angular momentum and magnetic quantum numbers), electronic spin and spin quantum numbers, Pauli’s exclusion principle, general idea of screening (constants) of outer electrons by inner electrons in an atom, Aufbau principle, Hund’s rule, atomic orbitals and their pictorial representation, electronic configurations of elements.

**Unit : 4 Classification of elements and periodicity in properties**

Need and genesis of classification of elements (from Doebereiner to Mendeleev), Modern periodic law and present form of periodic table, Nomenclature of elements with atomic number > 100, electronic configurations of elements and periodic table, electronic configuration and types of elements and s, p, d and f blocks, periodic trends in properties of elements (atomic size, ionization enthalpy, electron gain enthalpy,
valence/ oxidation states and chemical reactivity).

Unit : 5 Chemical energetics

Some basic concepts in thermodynamics, first law of thermodynamics, heat capacity, measurement of ΔU and ΔH, calorimetry, standard enthalpy changes, thermochemical equations, enthalpy changes during phase transformations, Hess’s Law, standard enthalpies of formation, bond enthalpies and calculations based on them.

Unit : 6 Chemical bonding

Kossel -Lewis approach to chemical bond formation, ionic bonds, covalent bonds, polarity of bonds and concept of electronegativity, valence shell electron pair repulsion (VSEPR) theory, shapes of simple molecules, valence bond theory, hybridization involving s, p and d orbitals and shapes of molecules s and p bonds; Molecular orbital theory involving homonuclear diatomic molecules; Hydrogen-bonding.

Unit : 7 Equilibrium

Equilibrium in physical and chemical processes

Equilibrium in physical and chemical processes, dynamic equilibrium, law of chemical equilibrium and equilibrium constant, homogeneous equilibrium, heterogeneous equilibrium, application of equilibrium constants, Relationship between reaction quotient Q, equilibrium constant, K and Gibbs’ energy G; factors affecting equilibrium-Le Chatelier’s principle.

Ionic equilibrium

Acids, Bases and Salts and their ionization, weak and strong electrolytes degree of ionization and ionization constants, concept of pH, ionic product of water, buffer solution, common ion effect, solubility of sparingly soluble salts and solubility products.

Unit : 8 Redox reactions

Electronic concepts of reduction - oxidation, redox reactions, oxidation number, balancing of redox reactions.

Unit : 9 Solid state Chemistry

Classification of solids based on different binding forces: molecular, ionic, covalent and metallic solids, amorphous and crystalline solids; unit cells in two dimensional and three dimensional lattices, calculation of density of a unit cell, packing in solids, voids, number of atoms per unit cell in a cubic unit cell, point defects, electrical and magnetic properties.

Unit : 10 Chemical thermodynamics

Spontaneous processes, energy and spontaneity, entropy and second law of thermodynamics, concept of absolute entropy, Gibbs energy and spontaneity, Gibbs energy change and equilibrium constant.

Unit : 11 Solutions

Types of solutions, different units for expressing concentration of solution, mole fraction, percentage (by volume and mass both), definitions of dilute solutions, vapour pressure of solutions and Raoult’s Law, Colligative properties, lowering of vapour pressure, depression of freezing point, elevation of boiling points and osmotic pressure, determination of molecular masses using colligative properties, abnormal values
of molecular masses, van’t Hoff factor.

Unit : 12 Chemical kinetics

Rate of chemical react ions, factors, affecting rates of reactions –concentration, temperature and catalyst, order and molecularity of reactions, rate law and rate constant, differential and integral forms of first order reaction, half-life (only zero and first order) characteristics of first order reaction, effect of temperature on reactions, Arrhenius theory - activation energy, collision theory of reaction rate (no derivation).

Unit : 13 Electrochemistry

Conductance in electrolytic solutions, specific and molar conductivity, variation of conductivity with concentration, Kohlrausch’s law, electrolysis and laws of electrolysis (elementary idea), electrolytic and galvanic cells, emf. of a cell, standard electrode potential, Nernst equation, concentration cell, fuel cells, cell potential and Gibbs energy, dry cell and lead accumulator.

Unit : 14 Surface chemistry

Adsorption - physisorption and chemisorption, factors affecting adsorption of gases on solids, catalysis, homogeneous and heterogeneous activity and selectivity, enzyme catalysis, colloidal state, distinction between true solutions, colloids and suspensions; lyophilic, lyophobic, multimolecular and macromolecular colloids, properties of colloids, Tyndal effect, Brownian movement, electrophoresis, coagulation, emulsions - type of emulsions.

Unit : 15 Hydrogen

Position of hydrogen in periodic table, isotopes of hydrogen, heavy water, hydrogen peroxidepreparation, reactions and structures; hydrides and their classification.

Unit : 16 s-Block Elements (Alkali and Alkaline Earth metals):

Group 1 and Group 2 elements
Electronic configurations and general trends in physical and chemical properties, anomalous properties of the first element of each group, diagonal relationship. Preparation and properties of some important compounds, sodium carbonate, sodium hydroxide, sodium hydrogen carbonate and industrial uses of lime and limestone, biological significance of Na, K, Mg and Ca.

Unit : 17 General principles and processes of isolation of elements

Principles and methods of extraction - concentration, reduction, (chemical and electrolytic methods), and refining. Occurrence and principles of extraction of Al, Cu, Zn and Fe.

Unit : 18 p-Block Elements

Introduction to p-block elements
Electronic configurations and general trends in properties, viz. atomic sizes, ionization enthalpies, electronegativity values, electron gain enthalpies and oxidation states across the periods and down the groups in the p-block.
Unique behaviour of the top element in each group of the block - the covalency l imi t and the pp – pp overlap in some molecules (e.g. N2 , O2) and i ts consequences; general trend in catenation tendency down each group.
Group-wise study of the p-block Elements

Group 13 - In addition to the general characteristics as outlined above, properties and uses of aluminium, nature of hydrides/halides and oxides; Properties, structures and uses of diborane boron halides, aluminium chloride, borax, boric acid and alums.

Group 14 - In addition to the general characteristics; carbon – catenation, allotropic forms (diamond and graphite), properties and structures of oxides; silicon - silicon tetrachloride, and structures and uses of silicates, silicones and zeolites.

Group 15 - In addition to the general characteristics, the general trends in the nature and structures of hydrides, halides and oxides of these elements. Preparation and properties of ammonia, nitric acid, phosphine and halides of phosphorus, structures of the oxoacids of phosphorus.

Group 16 - In addition to the general characteristics, preparations, properties and uses of dioxygen, simple oxides, ozone; sulphur - allotropic forms, compounds of sulphur, preparation, properties and uses of sulphur dioxide and sulphuric acid, industrial preparations of sulphuric acid, structures of oxoacids of sulphur.

Group 17 - In addition to the general characteristics, occurrence, trends in physical and chemical properties, oxides and oxoacids of halogens (structures only), preparation, properties and uses of chlorine and hydrochloric acid, trends in the acidic nature of hydrogen halides. Interhalogen compounds (structures only).

Group 18 - General introduction, electronic configurations, occurrence, trends in physical and chemical properties and uses, - fluorides and oxides of xenon (structures only).

Unit :19 The d- and f-Block elements

General introduction, electronic configuration, occurrence and characteristics of transition metals, general trends in properties of the first row transition metals – physical properties, ionization enthalpy, oxidation states, ionic radii, colour, catalytic property, magnetic property, interstitial compounds, alloy formation; preparations and properties of K2Cr2O7 and KMnO4.

Lanthanoids - Electronic configuration and oxidation states, chemical reactivity and lanthanoid contraction.

Actinoids - Electronic configuration and oxidation states.

Unit :20 Coordination compounds

Introduction to ligands, coordination number, colour, magnetic properties, and shapes; IUPAC - nomenclature of mononuclear coordination compounds, isomerism, bonding - valence bond approach to the bonding and basic ideas of Crystal Field Theory, colour and magnetic properties. Elementary ideas of metal - carbon bonds and organometallic compounds, importance of co-ordination compounds (in qualitative analysis, extraction of metals and biological systems).

Unit :21 Some basic principles of Organic Chemistry

- Tetravalence of carbon, hybridization (s and p), shapes of simple molecules, functional groups:- C=C-, -C_C- and those containing halogens, oxygen, nitrogen and sulphur; homologous series, isomerism.
- General introduction to naming organic compounds-trivial names and IUPAC nomenclature.
- Electronic displacement in a covalent bond; inductive effect, electromeric effect, resonance and hyperconjugation. Fission of covalent bond: free radicals, electrophiles and nucleophiles, carbocations and carbonanions.
- Common types of organic reactions: substitution, addition, elimination and rearrangement reactions.

Unit :22 Hydrocarbons


Unit :23 Purification and characterization of carbon compounds

- Purification of carbon compounds: filtration, crystallisation, sublimation, distillation, chromatography.
- Qualitative analysis: detection of nitrogen, sulphur, phosphorus and halogens.

Unit :24 Organic compounds with functional groups containing halogens (X)

- Nature of C-X bond in haloalkanes and haloarenes, nomenclature, physical and chemical properties, mechanism of substitution reactions, reactivity of C-X bond in haloalkanes and haloarenes.
- Some commercially important compounds: dichloro, trichloro and tetrachloromethanes; dichlorobenzene, freons, BHC, DDT, their uses and important reactions.

Unit :25 Organic compounds with functional groups containing oxygen

Alcohols and phenols: Nomenclature, methods of preparation, physical and chemical properties; chemical reactivity of phenols in electrophilic substitutions, acidic nature of phenol, ethers: electronic structure, structure of functional group, nomenclature, important methods of preparation, physical and chemical properties, some commercially important compounds. Aldehydes and ketones: Electronic structure of carbonyl group, nomenclature, important methods of preparation, physical properties and chemical reactions, relative reactivity of aldehydic and ketonic groups, acidity of anhydrogen, aldol condensation. Connizzarro reaction, nucleophilic addition reaction to >C=O groups. Carboxylic acids: Electronic structure of COOH, Nomenclature, important methods of preparation, physical properties and effect of substituents on a-carbon on acid strength, chemical reactions.
Derivatives of carboxylic acids: Electronic structure of acid chloride, acid anhydride, ester, and amide groups, nomenclature, important methods of preparation, comparative reactivity of acid derivatives. Some commercially important compounds.

Unit: 26 Organic Compounds with functional group containing nitrogen

- Structure, nomenclature of nitro, amino, cyano, and diazo compounds.
- Nitro compounds – important methods of preparation, physical properties and chemical reactions.
- Amines: primary, secondary, and tertiary amines, a general awareness, important methods of preparation, physical properties, basic character of amines, chemical reactions.
- Cyanides and isocyanides: preparation, physical properties and chemical reactions.
- Diazonium salts: Preparation, chemical reaction and uses of benzene diazonium chloride. Some commercially important nitrogen-containing carbon compounds, (aniline, TNT)

Unit: 27 Polymers
Classification of polymers, general methods of polymerization-addition and condensation: addition free radical, cationic, anionic polymerization, copolymerization, natural rubber, vulcanization of rubber, synthetic rubbers, condensation polymers, idea of macromolecules, biodegradable polymers. Some commercially important polymers (PVC, teflon, polystyrene, nylon-6 and 66, terylene and bakelite).

Unit: 28 Environmental Chemistry
Environmental pollution – air, water and soil pollutions, chemical reactions in atmosphere, smogs, major atmospheric pollutants, acid-rain, ozone and its reactions, effects of depletion of ozone layer, greenhouse effect and global warming – pollution due to industrial wastes, green chemistry as an alternative tool for reducing pollution, strategy for controlling environmental pollution.

Unit: 29 Biomolecules
Carbohydrates: Classification, aldose and ketose, monosaccharides (glucose and fructose), oligosaccharides (sucrose, lactose, maltose), polysaccharides (starch, cellulose, glycogen); important simple chemical reactions of glucose, elementary idea of structure of pentose and hexose.
Proteins: Elementary idea of a-amino acids, peptide bond, polypeptides, proteins; primary, secondary, and tertiary structure of proteins and quaternary structure (qualitative idea only), denaturation of proteins, enzymes.
Vitamins: Classification and functions
Nucleic acids: Chemical composition of DNA and RNA
Lipids: Chemical composition of DNA and RNA
Hormones: Classification and functions in biosystem.

Unit: 30 Chemistry in everyday life

- Chemicals in medicines – analgesics, tranquilizers, antiseptics, disinfectants, antimicrobials, antifertility drugs, antacids, antihistamines.
- Chemicals in food – preservatives, artificial sweetening agents.
- Cleansing agents – soaps and detergents, cleansing action.
- Rocket propellants: characteristics and chemicals used.
BIOLOGY (BOTANY AND ZOOLOGY)

Unit : 1 Diversity in Living World

Biology – its meaning and relevance to mankind
What is living; Taxonomic categories and aids (Botanical gardens, herbaria, museums, zoological parks); Systematics and Binomial system of nomenclature.
Introductory classification of living organisms (Two-kingdom system, Five-kingdom system); Major groups of each kingdom alongwith their salient features (Monera, including Archaeobacteria and Cyanobacteria, Protista, Fungi, Plantae, Animalia); Viruses; Lichens
Plant kingdom – Salient features of major groups (Algae to Angiosperms);
Animal kingdom – Salient features of Nonchordates up to phylum, and Chordates up to class level.

Unit : 2 Cell : The Unit of Life ; Structure and Function

Cell wall; Cell membrane; Endomembrane system (ER, Golgi apparatus/Dictyosome, Lysosomes, Vacuoles); Mitochondria; Plastids; Ribosomes; Cytoskeleton; Cilia and Flagella; Centrosome and Centriole; Nucleus; Microbodies. Structural differences between prokaryotic and eukaryotic, and between plant and animal cells. Cell cycle (various phases); Mitosis; Meiosis.
Biomolecules – Structure and function of Carbohydrates, Proteins, Lipids, and Nucleic acids.
Enzymes – Chemical nature, types, properties and mechanism of action.

Unit : 3 Genetics and Evolution

Mendelian inheritance; Chromosome theory of inheritance; Gene interaction; Incomplete dominance; Co-dominance; Complementary genes; Multiple alleles; Linkage and Crossing over; Inheritance patterns of hemophilia and blood groups in humans.
DNA –its organization and replication; Transcription and Translation; Gene expression and regulation; DNA fingerprinting.
Theories and evidences of evolution, including modern Darwinism.

Unit : 4 Structure and Function – Plants

Morphology of a flowering plant; Tissues and tissue systems in plants; Anatomy and function of root, stem (including modifications), leaf, inflorescence, flower (including position and arrangement of different whorls, placentation), fruit and seed; Types of fruit; Secondary growth; Absorption and movement of water (including diffusion, osmosis and water relations of cell) and of nutrients; Translocation of food; Transpiration and gaseous exchange; Mechanism of stomatal movement.
Mineral nutrition – Macro- and micro-nutrients in plants including deficiency disorders; Biological nitrogen fixation mechanism.
Photosynthesis – Light reaction, cyclic and non-cyclic photophosphorylation; Various pathways of carbon dioxide fixation; Photorespiration; Limiting factors.
Respiration – Anaerobic, Fermentation, Aerobic; Glycolysis, TCA cycle; Electron transport system; Energy relations.

Unit : 5 Structure and Function - Animals

Tissues; Elementary knowledge of morphology, anatomy and functions of different systems of earthworm, cockroach and frog.
Human Physiology – Digestive system - organs, digestion and absorption;
Respiratory system –
Excretion system – Urine formation, regulation of kidney function
Locomotion and movement – Skeletal system, joints, muscles, types of movement.
Control and co-ordination – Central and peripheral nervous systems, structure and function of neuron, reflex action and sensory reception; Role of various types of endocrine glands; Mechanism of hormone action.

**Unit : 6 Reproduction, Growth and Movement in Plants**

Asexual methods of reproduction; Sexual Reproduction - Development of male and female gametophytes; Pollination (Types and agents); Fertilization; Development of embryo, endosperm, seed and fruit (including parthenocarpy and apomixis).
Growth and Movement – Growth phases; Types of growth regulators and their role in seed dormancy, germination and movement; Apical dominance; Senescence; Abscission; Photo- periodism; Vernalisation; Various types of movements.

**Unit : 7 Reproduction and Development in Humans**

Male and female reproductive systems; Menstrual cycle; Gamete production; Fertilisation; Implantation; Embryo development; Pregnancy and parturition; Birth control and contraception.

**Unit : 8 Ecology and Environment**

Meaning of ecology, environment, habitat and niche. Ecological levels of organization (organism to biosphere); Characteristics of Species, Population, Biotic Community and Ecosystem; Succession and Climax.
Ecosystem – Biotic and abiotic components; Ecological pyramids; Food chain and Food web; Energy flow; Major types of ecosystems including agroecosystem.
Ecological adaptations – Structural and physiological features in plants and animals of aquatic and desert habitats.
Biodiversity – Meaning, types and conservation strategies (Biosphere reserves, National parks and Sanctuaries)
Environmental Issues – Air and Water Pollution (sources and major pollutants); Global warming and Climate change; Ozonedepletion; Noise pollution; Radioactive pollution; Methods of pollution control (including an idea of bioremediation); Deforestation; Extinction of species (Hot Spots).

**Unit : 9 Biology and Human Welfare**

Animal husbandry – Livestock, Poultry, Fisheries; Major animal diseases and their control. Pathogens of major communicable diseases of humans caused by fungi, bacteria, viruses, protozoans and helminths, and their control. Cancer; AIDS. Adolescence and drug/alcohol abuse; Basic concepts of immunology. Plant Breeding and Tissue Culture in crop improvement. Biofertilisers (green manure, symbiotic and free-living nitrogen-fixing microbes, mycorrhizae); Biopesticides (micro-organisms as biocontrol agents for pests and pathogens); Bioherbicides; Microorganisms as pathogens of plant diseases with special reference to rust and smut of wheat, bacterial leaf blight of rice, late blight of potato, bean mosaic, and root - knot of vegetables.
Bioenergy – Hydrocarbon - rich plants as substitute of fossil fuels.

**Unit:10 Biotechnology and its Applications**

Microbes as ideal system for biotechnology; Microbial technology in food processing, industrial production (alcohol, acids, enzymes, antibiotics), sewage treatment and energy generation.
Steps in recombinant DNA technology – restriction enzymes, DNA insertion by vectors and other methods, regeneration of recombinants.
APPENDIX-III
SYLLABUS FOR B.TECH. (LATERAL ENTRY)

MATHEMATICS

Unit 1: Ordinary Differential Equation
Differential equation of first order. Linear differential equation of second order (homogeneous and nonhomogeneous case). Cauchy, Euler’s equation, Application of first order differential equations (mixture problem, Newton’s law of cooling, orthogonal trajectory). Application to LCR circuits, Application to free and forced vibration of Mass spring system.

Unit 2: Series Method
Properties of power series, Radius of convergence of power series, Legender’s equation and Legender’s polynomial, properties of Legender’s polynomial, Gamma function, ordinary and singular point Frobenious method, Bessel’s equation and properties of Bessel’s function.

Unit 3: Laplace Transform
Laplace transforms of standard function, periodic functions, Unit step function, Transforms of derivatives and integrals. Differentiation and integration of transforms, Linearity property, Inverse Laplace transform, Shifting theorems, Convolution. Application to solve differential and integral equations (initial value problem).

Unit 4: Fourier Series
Periodic function, Fourier series, Euler’s formula, Even and odd functions, Fourier series expansions of even and odd function, half range expansion of functions, Expansion of functions with finite discontinuities.

Unit 5: Matrix

Application of eigen values and vectors to solve the system of homogeneous linear differential equation.

Unit 6: Vectors:
Vector algebra, product of vectors, vector differentiation, vector differential operator, gradient, directional derivatives, divergence, curl, line integral, double integral, green’s theorem.

ENGINEERING MECHANICS

Unit 1: Statics
Conditions of equilibrium, concept of free body diagram, methods of moments and solution to engineering problems.

Friction : Static friction, ladder friction, problems with friction, Belt friction and screw jack, force analysis of plane trusses (method of joint, method of sections, plane frames, methods of members), Parallel forces in a plane, Centre of parallel forces, Pappus Guldinus theorems, MI of plane figures, parallel axis theorem, perpendicular axis theorem, Polar MI. Principle of virtual work for a single particle, rigid bodies, ideal systems and constrained bodies.

Unit 2: Dynamics
Force proportional to displacement, free vibration, D’Alembert’s principle, momentum and impulse. Application to principle of linear momentum to a single particle, rigid bodies and ideal systems. Application to principle of angular momentum to a single particle and rotating...
rigid bodies. Principle of conservation of momentum.

**Unit 3: Work and Energy**

Principle of work and energy for ideal system, Conservation of energy.

**BASIC ELECTRICAL ENGINEERING**

**Unit 1: Electrostatics**


**Unit 2: Electromagnetism**


Electrodynaminc force:- Faraday’s law of electromagnetic induction, Eddy current, emf induced in a conductor moving in a magnetic field. Energy stored in a magnetic field.

**Unit 3: D.C. Circuit**


**Unit 4: A.C. Circuit**


**Unit 5: Instrument**

Construction and principle of operation-PMMC, MI and dynamometer type ammeter, voltmeter and dynamometer type wattmeter. Power factor meter.

**Unit 6: Illumination**

Law of illumination- Solid angle, Luminous flux, Luminous intensity, illumination brightness and luminous efficiency.

**Unit 7: Production Light**

Filament lamp, Arc lamp, Electric discharge lamps, Sodium vapour lamp, Mercury vapour lamp-Theory of electrical energy radiation. Comparison between filament lamp and fluorescent lamp.
MATHEMATICS


Unit 2:- Number Systems : Real numbers (algebraic and other properties), rational and irrational numbers, Complex numbers, Algebra of complex numbers, Conjugate and square root of a complex number, cube roots of unity, De Moivre’s Theorem with simple applications. Permutation and combinations and their simple applications, Mathematical induction, Binomial Theorem. Determinants up to third order, Minors and Cofactors, Properties of determinants. Matrices up to third order, Types of Matrices. Algebra of matrices, Adjoint and inverse of a matrix. Application of determinants and matrices to the solution of linear equation (in three unknowns)

Unit 3:- Trigonometry : Compound angles, Multiple and Sub-multiple angles, solution of trigonometric equations, Properties of triangles, Inverse circular function.

Unit 4:- Co-ordinate Geometry of Two Dimensions : Straight lines, pairs of straight lines, Circles, Equations of tangents and normals to a circle. Equations of Parabola, Ellipse and Hyperbola, Ellipse and hyperbola in simple forms and their tangents (Focus, directix, eccentricity and latus rectum in all cases)

Unit 5:-Co-ordinate Geometry of Three Dimensions: Distance and division formulae, Direction cosines and direction ratios. Projections, Angles between two planes, Angle between a line and plane. Equations of a sphere general equation.

Unit 6: -Vector Fundamentals, Dot and Cross product of two vectors, Scalar triple product, Simple Applications (to geometry, work and moment).

Unit 7:-Differential Calculus : Concept of limit, continuity, Derivation of standard functions, successive differentiation, simple cases, Leibnitz Theorem, Partial differentiation, Simple cases, derivatives as rate measure, Maxima and minima, indeterminate forms, Geometrical applications such as tangents and normals to plane curves.

Unit 8:-Integral Calculus:- Standard methods of integration (substitution, by pars, by partial fractions etc.) Definite integrals and properties of Definite Integrals. Areas under plane curves, Differential Equations only simple cases such as (i) dy/dx = f(x) (ii) dy/dx=f(x) g (y) (iii) d²y/dx² = f(x) and application to motions in a straight line.

Unit 9:-Probability and Statistics : Averages (Mean, Median and Mode), Dispersion (standard deviation and variance). Definition of probability, Mutually exclusive events, Independent events, Addition theorem.

COMPUTER AWARENESS

Computer Basics: Organization of a Computer, Central Processing Unit (CPU), Structure of instructions in CPU, input/output devices, computer memory, back-up devices.

DATA REPRESENTATION

Representation of characters, integers and fractions, binary and hexadecimal representations, Binary Arithmetic : Addition, subtraction, multiplication, division, simple arithmetic and two’s complement arithmetic, floating point representation of numbers, Boolean algebra, truth tables, venn diagram.

ANALYTICAL ABILITY AND LOGICAL REASONING

Questions in this section will test logical reasoning and quantitative reasoning.
SYLLBUS FOR M.SC. (BIOTECHNOLOGY / APPLIED MICROBIOLOGY)

BIOLOGY (10+2+3 Standard)

Unit 1: General Biology
Taxonomy; Heredity; Genetic variation; Conservation; Principles of ecology; Evolution; Techniques in modern biology.

Unit 2 - 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.

Unit 3: Basic Biotechnology
Tissue culture; Application of enzymes; Antigen-antibody interaction; Antibody production; Diagnostic aids.

Unit 4: Molecular Biology
DNA; RNA; Replication; Transcription; Translation; Proteins; Lipids; Membranes; Gene transfer.

Unit 5: Cell Biology
Cell cycle; Cytoskeletal elements; Mitochondria; Endoplasmic reticulum; chloroplast; Golgi apparatus; Signaling.

Unit 6: Microbiology
Isolation; Cultivation; Characterization and enumeration of virus; Bacteria; Fungi; Protozoa; Pathogenic micro-organisms.

CHEMISTRY (10+2+3 Standard)

Unit 1: Atomic Structure
Bohr’s theory and Schrodinger wave equation; Periodicity in properties; Chemical bonding; Properties of s, p, d and f 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.

Unit 2: 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 Standard)

PHYSICS (10+2 Standard)

(APPENDIX –VI)
STATE CODE

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## EXAMINATION CENTRE FOR KIITEE-2015

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CALENDAR OF EVENTS

Apply online From : 02-12-2014
                      to
                      20-03-2015

Last date of receiving : 25-03-2015
Filled in Application form

Last date of hosting Admit Card : 05-04-2015
in the website

Date of Entrance Examination : 21-04-2015
                            to
                            30-04-2015

Declaration of Result : 15-05-2015
Counseling : 02-06-2015
              to
              15-06-2015

Detailed counseling schedule would be notified after the publication of result.