Continuous Learning...

Information Brochure

KIITEE-2024

Accredited by
NAAC in 'A++ Grade'

'Tier I' Accreditation (Washington Accord) by NBA for Engineering Streams

Accredited by
ABET, USA (B.Tech. Programme)

Accredited by
IET, U.K. (B.Tech. Programme)
ADMISSION POLICY

Admission to all the courses (except MBBS, BDS, PG Medical & PG Dental) will be ONLY through KIITEE – 2024
1.0 KIITEE – 2024

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’
- Go through the Instructions to fill up the form.
- Fill up ‘Online Application Form’ and click on the submit button.
- Upload Photographs, Signature & 10th Marksheet/Certificate to complete the application process.

1.2 ADMIT CARD

Admit Card will be hosted in the website and also send through mail. 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

Apply Online : 10-11-2023
Last date to Apply online (1st Phase) : 19-03-2024
Date of Entrance Examination(1st Phase)* : 27-03-2024
TO : 31-03-2024
Last date to Apply online (2nd Phase) *: 10-05-2024
Date of Entrance Examination (2nd Phase)* : 22-05-2024
TO *
*:26-05-2024
Last date to Apply online (3rd Phase)* : 25-06-2024
Date of Entrance Examination (3rd Phase)* : 02-07-2024
TO *
*:04-07-2024

*These are the tentative dates and subject to change.

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 are briefed about 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 screen 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. The candidate 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 he/she 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 150 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. (4 Years) B.Tech & M.Tech. - Biotechnology(5years):
Candidates applying for B.Tech.(4years), B.Tech & M.Tech-Biotechnology Course should fulfill the following criteria.

I. Candidates who have passed 10+2 examination in 2022, 2023 or appearing in 10+2 examination in 2024 are only eligible to apply for B.Tech (4 years),B.Design, B.Tech & M.Tech. -Biotechnology 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. -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 01.07.2003,
### Course wise Eligibility Criteria B.TECH (L.E)

<table>
<thead>
<tr>
<th>For Admission Into Following Branches</th>
<th>Eligible Diploma Holders</th>
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<tbody>
<tr>
<td>Civil Engg.</td>
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<tr>
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<td>Electrical Engg./ Electronics &amp; Electrical Engg</td>
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### 3.2 For B.Tech. -L.E (3 years):
For Admission Into Following Branches
- Civil Engg.
- Mechanical Engg./Automobile Engg./Mechatronics/Aerospace Engg.
- Electrical Engg.
- Electronics & Electrical Engg.
- Computer Science & Engg./Information Technology
- Chemical Enggi

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.

Age: Lower age should be 17 years as on 31.12.24 & upper age limit should be maximum 35 years as on 31.12.24

### 3.3 For B.Arch (5 years):
Pass in 10+2 examination with 50% marks in Physics, Chemistry and Mathematics and also 50% marks in aggregate of the 10+2 examination.
Pass in the National Aptitude Test in Architecture (NATA) conducted by the Council of Architecture (COA), New Delhi 2024.

### 3.4 For B.Sc. Nursing (4 years):
Candidate with Science who have passed the qualifying 12th Standard examination (10+2) and must have obtained a minimum of 45% marks in Physics, Chemistry and Biology taken together and passed in English individually.

### 3.5 For B.Pharma (4 years):
Pass in 10+2 or equivalent examination with Physics, Chemistry & Biology and English (PCBE) with at least 45% marks in aggregate.

### 3.6 For D.Pharma (2 years):
Pass in 10+2 or equivalent examination with Physics, Chemistry & Biology and English (PCBE) with at least 45% marks in aggregate.

### 3.7 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 50% marks. For B.Sc. LL.B candidates should have passed 10+2 or equivalent in the science stream with at least 45% marks.

### 3.8 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.

### 3.9 BCA (3 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.

### 3.10 Bachelor of Design (Fashion/Textile) (4 years):
Pass in 10+2 in any stream with 50% marks in aggregate.

### 3.11 Bachelor of Film & Television Production (3 years):
Pass in 10+2 in any stream with 50% marks in aggregate.

### 3.12 Bachelor of Communication & Journalism (3 Years):
Pass in 10+2 in any stream with 50% marks in aggregate.

### 3.13 B.Sc. Computer science (4 years):
Pass in 10+2 Science or equivalent having mathematics as one of the subject with at least 50% marks.

### 3.14 B.A Economics(Hons) (4 years):
Pass in 10+2 or equivalent with at least 50% marks.

### 3.15 B.A English(Hons) (4 years):
Pass in 10+2 or equivalent with at least 50% marks.

### 3.16 B.A Sociology(Hons) (4 years):
Pass in 10+2 or equivalent with at least 50% marks.
3.17. B.A Psychology (Hons) (4 years): Pass in 10+2 or equivalent with at least 50% marks.

3.18. B.Com (4 years): Pass in 10+2 in any stream with at least 50% marks and having Mathematics / Business Mathematics & Statistics as one of the subjects in 10+2 level.

3.19. B.Design (Automobile/Grafics/Product) (4 years): Pass in 10+2 or equivalent with at least 50% marks.

3.20. A candidates 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

3.21. For MCA (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.

3.22. For M.Tech. (2 years) / Int.M.Tech & Ph.D(5Years): 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) / Int.M.Tech & Ph.D(5Years)

Computer Science & Engineering/ Int.M.Tech & Ph.D(5Years)
Specialization in 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, Electronics & Tele-Comm., Electronics & Instrumentation or First Class in M.Sc. or First Class in M.Sc. Comp.Sc./ Information Technology.

Electronics & Tele- Communication Engineering / Int.M.Tech & Ph.D(5Years):

Specialization in Communication Engineering/ VLSI Design & Embedded System/RF & Microwave:

First Class B.E. / B.Tech., or equivalent in Electronics & Tele-Comm., Electronics & Instrumentation, Electrical & Electronics, Electronics & Electrical or First Class in M.Sc. (Electronics).

Mechanical Engineering/ Int.M.Tech & Ph.D(5Years): Specialization in Manufacturing Process & Systems/Thermal Engineering/Mechanical Design:

First Class B.E. / B.Tech. or equivalent in Mechanical / Production Engineering.

Civil Engineering Int.M.Tech & Ph.D(5Years): Specialization in Construction Engineering /Management/Structural Engineering/ Geotechnical Engineering/Water Resources Engineering/ Transportation Engineering/ Environmental Engineering:

First Class B.E./ B.Tech. or equivalent in Civil Engineering.

3.23. M.Sc. (Biotechnology/Applied Microbiology) (2 years): Bachelor’s degree in any branch of Science/ Agriculture/ Pharmacy/ Veterinary / Engineering / Technology / Medicine (MBBS/BDS) with at least 55% marks.

3.24. M.Sc. Nursing (2 Years): The candidate should be a Registered Nurse and Registered midwife or equivalent With any State Nursing Registration Council. The minimum education requirements shall be the passing of B.Sc. Nursing / B.Sc. Hons. Nursing / Post Basic B.Sc. Nursing with minimum of 55% aggregate marks. The candidate should have
undergone in B.Sc. Nursing / B.Sc. Hons. Nursing /Post Basic B.Sc. Nursing in an institution which is recognized by Indian Nursing Council. Minimum one year of work experience after Basic B.Sc. Nursing. Minimum one year of work experience prior or after Post Basic B.Sc. Nursing. Candidate shall be medically fit.7. 5% relaxation of marks for SC/ST candidates may be given.

3.25. **LL.M. (2Year)** Candidate should have passed B.A.LLB/BBA LLB/B.Sc.LLB/LLB, degree or an equivalent degree from recognized university and must have secured at least 55% of marks in aggregate

3.26. **For Master of Public Health (2Years)** Candidate must have passed Bachelors’ degree in Medicine, AYUSH, Dentistry, Nursing, Pharmacy, Veterinary Sciences, Physiotherapy, or Allied Health Sciences from a recognized Institute / University with minimum 50% marks in aggregate, (or) Bachelor’s degree in Technology (BTech), Public Health (BPH), Business Administration (BBA) or Law (LLB) from a recognized Institute / University with minimum 50% marks in aggregate, (or) Bachelor’s degree in Science / Life science / Statistics / Economics / Nutrition / Demography from a recognized Institute / University with minimum 50% marks in aggregate..

3.27. **For Master of Hospital Administration: (2Years)** Candidate must have passed Bachelors’ degree in Medicine, AYUSH, Dentistry, Nursing, Pharmacy, Veterinary Sciences, Physiotherapy, or Allied Health Sciences from a recognized university with minimum 50% marks in aggregate, (or) Bachelor’s degree in Technology (BTech), Commuter Application (BCA), Hospital Administration (BHA/BHM), Public Health (BPH/BSc-PH), Business Administration (BBA), Law (LLB) or equivalent degree from a recognized Institute or university with minimum 50% marks in aggregate, (or) Bachelor’s degree in Science/Arts/Commerce from a recognized Institute or university with minimum 50% marks in aggregate, (or) Bachelor’s degree or equivalent in any other discipline from a recognized Institute or university with minimum 50% marks in aggregate.

3.28. **M.sc.in Physics/Chemistry/Mathematics with Data Sciences (2 years):** B.Sc./B.E./B.Tech. or an equivalent degree with at least 60% marks, Students possessing Bachelor's Degree with Physics / Chemistry / Mathematics as one of the main subjects or Engineering graduates with a strong aptitude for the above areas are eligible to apply. Students who are in the final year of graduation may also apply.

3.29. **For M.A in Sports and Yogic Sciences (2Years):** Graduate in any discipline are eligible

3.30. **M.Sc.Computer Science (2Years):** Candidates must have B.Sc degree in Computer Science / IT /Mathematics /Electronics /Physics /Chemistry /BCA with minimum 50% aggregate marks.

3.31. **M.Arch (2Years):** Candidates must have B.Arch degree with minimum 50% aggregate mark.

3.32. **MA in Economics: (2Years):** The candidate must have passed in Graduation or equivalent with one subject as Economics / Mathematics / Statistics with at least 60% mark.

3.33. **MA in English (2Years):** The candidate must have passed in Graduation or equivalent with one subject as English with at least 60% mark.

3.34. **MA in Sociology (2Years):** The candidate must have passed in Graduation or equivalent with at least 60% mark.

3.35. **M.Com (2Years):** The candidate must have a bachelor’s degree in Management or Commerce from a recognized university with a minimum of 60% marks in aggregate.

3.36. **M.A in Psychology (2Years):** The candidate must have passed in Graduation or equivalent with one subject as English with at least 60% mark.

3.37. **Master of Communication & Journalism (2Years):** The candidate must have passed in Graduation or equivalent with at least 50% mark.

3.38. **MA/M.Sc. Public Policy (2Years):** Any Graduate with minimum 60% marks in graduation or equivalent having mathematics/statistics/Business mathematics either in 10+2 or graduation level as one of the subjects.

3.39. **M.Design (Interior Design) (2Years):** The candidate must have passed in Graduation or equivalent with at least 50% mark.

### RESEARCH PROGRAMME

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

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.

4.1 EVALUATION AND DECLARATION OF RESULTS

Results of KIITEE-2024 will be declared on the basis of marks secured by the candidate in Entrance Examination, separate Merit lists will be prepared for B.Tech(4 years) / B.Design/ B.Arch. / B.Tech. (LE), /B.Sc. Nursing /BPH/ BBA / BCA / B.ALL.B / BBA.LLB / B.Sc.LL.B, Bachelor of Design (Fashion / Textile), Bachelor of Film & Television Production/ years/Bachelor of Communication & Journalism, Biotechnology- (B.Tech / M.Tech) , M.Tech. LLM, MCA/B.Pharm/D.Pharm/ M.Design /MPH/MHA/M.Sc. (Biotecnology)/BAPsychology/BSc.ComputerScien ce/B.AEconomics(Hons)/B.AEnglish(Hons)/B.ASoci ology(Hons)/B.Com./M.Sc.AppliedMicrobiology)/M .Com/M.A in Economics/M.A in English/M.A in Sociology/M.A Psychology /M.Sc in Computer Science/ Master of Communication & Journalism / 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. Candidates can also 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.Design (4 Years):- 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 candidates).

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

BBA/BCA/Bachelor in Design(Fashion/Textile)/ B.Design/Bachelor in Film & Television Production /BA.LLB/BBA LLB/B.Sc.LLB / Bachelor of Mass

Communication & Journalism): - 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- (B.Tech/M.Tech) (5 Years): - On the basis of marks obtained in Biology, then in Chemistry and then by age (preference to older candidates)

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B.Sc in Computer Science/ B.A Economics (Hons)/B.A English (Hons)/B.A Sociology (Hons)/ B.A Psychology (Hons B.Com.:
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), 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. Demand Draft of Rs. 75,000/- which includes the Counseling Registration fees of Rs.10,000 (Non Refundable) 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-2024 Quota Seats are distributed among different categories of candidates as follows. Separate Merit list will be prepared for each Category. **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-2024.

<table>
<thead>
<tr>
<th>Categories of Candidates</th>
<th>% of seats</th>
</tr>
</thead>
<tbody>
<tr>
<td>General</td>
<td>-</td>
</tr>
<tr>
<td>Scheduled Caste</td>
<td>-</td>
</tr>
<tr>
<td>Scheduled Tribe</td>
<td>-</td>
</tr>
<tr>
<td>Physically Challenged</td>
<td>-</td>
</tr>
</tbody>
</table>

15% & 7.5% seats of KIITEE-2024 quota seats will be reserved for Schedule Caste & Scheduled Tribe (by birth) respectively. (Not by adoption or marriage)

3% seats of KIITEE-2024 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. Biotechnology)

All the unfilled reserved seats will be converted to General 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>

7.0 Legal Jurisdiction

All disputes pertaining to the conduct of KIITEE-2024 shall fall within the jurisdiction of Bhubaneswar only. If any person or officer engages himself/herself in act(s) that would in this Examination, he/she shall be liable to prosecution under the Indian Penal Code. result in the leakage of the question paper(s) or attempt to use or help in the use of unfair means
<table>
<thead>
<tr>
<th>Course</th>
<th>Subjects</th>
<th>No. of Questions</th>
<th>Syllabus</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Chemistry</td>
<td>40</td>
</tr>
<tr>
<td>B.Tech.(4years)/B.Arch./B.Sc. Computer Science/Biotechnology- B.Tech &amp; M.Tech</td>
<td>(10+2 (Standard)</td>
<td>Mathematics</td>
<td>40</td>
</tr>
<tr>
<td>B.Sc Nursing/B.Pharma /D.Pharma/ Biotechnology-B.Tech &amp; M.Tech</td>
<td>(10+2 (standard)</td>
<td>Biology</td>
<td>40</td>
</tr>
<tr>
<td>B.Tech.(Lateral Entry)</td>
<td>Mathematics</td>
<td>40</td>
<td>The detail Syllabus is given in the Appendix-IV</td>
</tr>
<tr>
<td></td>
<td>Basic Electrical Engineering</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Engineering Mechanics</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>BBA/BCA/BA.LLB/ BBA.LLB/BSc.LLB /B.A Economics(Hons)/B.Com(Hons)/B.AEnglish (Hons)/B.A Sociology(Hons)/B.A Psychology(Hons)</td>
<td>Mathematical Ability</td>
<td>30</td>
<td></td>
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<tr>
<td></td>
<td>Analytical &amp; Logical Ability</td>
<td>30</td>
<td></td>
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<tr>
<td></td>
<td>Verbal Ability</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td></td>
<td>General Knowledge</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Bachelor of Design (Fashion/Textile)/ Bachelor of Film &amp; Television Production// Bachelor of Communication &amp; Journalism/B.Design(Automobile/Product/Graphics)</td>
<td>English</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td></td>
<td>General Knowledge &amp; Current Affairs</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Analytical Reasoning</td>
<td>20</td>
<td></td>
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<tr>
<td></td>
<td>Aptitude</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>MCA/ M.Sc. Computer Science.</td>
<td>Mathematics(10+2 Standard)</td>
<td>60</td>
<td>The detail Syllabus is</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./Int.M.Tech &amp; Ph.D</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>Course</td>
<td>Syllabus</td>
<td>Marks</td>
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<td>-----------------------------------------------------------------------</td>
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<tr>
<td>M.Sc. (Biotechnology) &amp; M.Sc. (Applied Microbiology) (2 years)</td>
<td>Biology (10+2+3 Standard)</td>
<td>50</td>
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</tr>
<tr>
<td></td>
<td>Chemistry (10+2 Standard)</td>
<td>30</td>
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<tr>
<td></td>
<td>Mathematics (10+2 Standard)</td>
<td>20</td>
<td></td>
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<tr>
<td></td>
<td>Physics (10+2 Standard)</td>
<td>20</td>
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<tr>
<td></td>
<td>The detail Syllabus is given in the Appendix-VI</td>
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<td></td>
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<tr>
<td></td>
<td>Logical Reasoning &amp; Data Interpretation</td>
<td>30</td>
<td></td>
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<tr>
<td></td>
<td>English</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td></td>
<td>General Awareness</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>M.Sc Nursing</td>
<td>B.Sc Nursing</td>
<td>120</td>
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<tr>
<td></td>
<td>The questions will be pertaining to the B.Sc Nursing Syllabus.</td>
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<tr>
<td>M.Sc - Programme Physics/ Chemistry/ Mathematics and Data Sciences</td>
<td>B.Sc</td>
<td>120</td>
<td></td>
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<tr>
<td></td>
<td>The questions will be pertaining to the B.Sc Syllabus</td>
<td></td>
<td></td>
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<tr>
<td>Ph.D.</td>
<td>Teaching and Research Aptitude</td>
<td>60</td>
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<tr>
<td></td>
<td>Subject Specific</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>MA in Economics</td>
<td>BA (Economics)</td>
<td>120</td>
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<tr>
<td></td>
<td>The questions will be pertaining to the BA (Economics) Syllabus.</td>
<td></td>
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<tr>
<td>MA in English</td>
<td>BA (English)</td>
<td>120</td>
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<tr>
<td></td>
<td>The questions will be pertaining to the BA (English) Syllabus.</td>
<td></td>
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<tr>
<td>MA in Sociology</td>
<td>BA (Sociology)</td>
<td>120</td>
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<tr>
<td></td>
<td>The questions will be pertaining to the BA (Sociology) Syllabus.</td>
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<tr>
<td>MA in Psychology</td>
<td>BA (Psychology)</td>
<td>120</td>
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<tr>
<td></td>
<td>The questions will be pertaining to the BA (Psychology) Syllabus.</td>
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<tr>
<td>M.Com.</td>
<td>B.Com</td>
<td>120</td>
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<tr>
<td></td>
<td>The questions will be pertaining to the B.Com Syllabus.</td>
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<td></td>
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<tr>
<td>Master of Communication &amp; Journalism</td>
<td>English</td>
<td>40</td>
<td></td>
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<tr>
<td></td>
<td>Analytical Reasoning</td>
<td>20</td>
<td></td>
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<tr>
<td></td>
<td>Current Affairs</td>
<td>30</td>
<td></td>
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<tr>
<td></td>
<td>Basic Knowledge of Mass Media</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>M. Arch</td>
<td>B. Arch</td>
<td>120</td>
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<td></td>
<td>The questions will be pertaining to the B. Arch Syllabus.</td>
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</tbody>
</table>
(APPENDIX-I)

SYLLABUS FOR B.TECH./B.DESIGN/BIOTECHNOLOGY- B.TECH / M.TECH & B.SC.NURSING/B.PHARMA/D.PHARMA/B.SC. COMPUTER SCIENCE

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, gravitation 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. Kirchhoff’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: Magneto statics
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.
Halogens- 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.

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 Iodoform.

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-they are not fully transcribed.

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 & tranquillisers),
Rocket propellants.
(Structural formulae non-evalutive)

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.

(APPENDIX-II)
SYLLABUS FOR B.TECH./B.DESIGN/ BIOTECHNOLOGY- (B.TECH / M.TECH)

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, composition of 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: 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 7: Sequences and Series


Unit 8: 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 9: Integral Calculus


Unit 10: 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

\[ \frac{d^2y}{dx^2} = f(x) \]

Unit 11: Two Dimensional Geometry

Recall of Cartesian system of rectangular coordinates in a plane, distance formula, area of a triangle, condition of 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 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 12: 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 13: 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 14: Probability**

Probability of an event, addition and multiplication theorems of probability and their application; Conditional probability, Total probability theorem, Bayes’ Theorem, independence of events.

**Unit 15: Trigonometry**

Trigonometrically 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.

**(APPENDIX-III)**

**BIOTECHNOLOGY- B.TECH / M.TECH & B.SC.NURSING.B.PHARMA/D.PHARMA**

**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 along with their salient features (Monera, including Archaeabacteria 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.
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; Ozone depletion; 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 (microorganisms 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. Applications of R-DNA technology. In human health –Production of Insulin, Vaccines and Growth hormones, Organ transplant, Gene therapy. In Industry – Production of expensive enzymes, strain improvement to scale up bioprocesses. In Agriculture – GM crops by transfer of genes for nitrogen fixation, herbicide-resistance and pest-resistance including Bt crops.
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, Legendre’s equation and Legendre’s polynomial, properties of Legendre’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**

Electrodynamic 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.

(APPENDIX-VI)
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)

Physical World and Measurement, Kinematics, Laws of Motion, Work, Energy and Power, Electrostatics, Current electricity, Magnetic...

(APPENDIX –VII) STATE CODE

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**EXAMINATION CENTRE FOR KIITEE-2024**

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