



ख्वाजा मुईनुद्दीन चिश्ती भाषा विश्वविद्यालय, लखनऊ, उत्तर प्रदेश (भारत)

Khwaja Moinuddin Chishti Language University, Lucknow, U.P. (India)

U.P. STATE GOVERNMENT UNIVERSITY

(Organised Under Section 7(f) & 12(B) of the U.G. Act, 1956 & U.Tech. approved by (MCIIE)

**DEPARTMENT OF
APPLIED SCIENCE AND HUMANITIES
BOARD OF STUDIES (BoS)**

(Effective from Session 2024-25)



BTech Ist year Complete
Syllabus

Amish
13/09/2024



AGENDA

The Board of Studies (BoS) meeting of the Department of Applied Science and Humanities, Faculty of Engineering & Technology is to be held in the Administrative Block of KhwajaMoinuddin Chishti Language University, Lucknow on 02,September, 2024.

The following agenda will be discussed:

Agenda No. 1: Discussion and approval of the Study Evaluation Scheme/Syllabi for B.Tech First Year Programme.

Agenda No.2:Discussion and approval of the Study Evaluation Scheme/Syllabi for Humanities Papers.

Agenda No.3:Discussion and Approval of Laboratory Syllabi for Department of Applied Science and Humanities.

Agenda No.4: Any other discussions/suggestions related to the academic development of the University.

**Chairperson
(BoS Committee)**



ख्वाजा मुईनुद्दीन चिश्ती भाषा विश्वविद्यालय, लखनऊ, उत्तर प्रदेश (भारत)

Khwaja Moinuddin Chishti Language University, Lucknow, U.P. (India)

U.P. STATE GOVERNMENT UNIVERSITY,

(Recognised Under Section 10 & 12(B) of the UGC Act, 1956 & B.Tech. Approved by (AICTE))

Board of Studies (BoS) Meeting Held on 2nd September, 2024
Department of Applied Science and Humanities

| S. No. | Member Name | Signature |
|--------|--|--------------|
| 1 | Prof. Syed Haider Ali Department of Applied Science and Humanities Faculty of Engineering and Technology | |
| 2 | Prof. R.S. Gupta (Retd.) Department of Mathematics KNIT Sultanpur | |
| 3 | Dr. S.N. Mishra Department of Mathematics I.E.T. Lucknow | |
| 4 | Prof. O.P. Singh Department of Physics I.E.T. Lucknow | |
| 5 | Dr. Santosh Kumar Singh Department of Physics I.E.T. Lucknow | |
| 6 | Prof. Subodh Wariya Department of Electronics Engineering I.E.T. Lucknow | |
| 7 | Prof. Manoj Shukla Department of Electronics Engineering HBTU Kanpur | |
| 8 | Prof. Sanjay Singh Department of Chemistry I.E.T. Lucknow | 02/09/24 |
| 9 | Prof. Sanjay Srivastava Department of Chemistry I.E.T. Lucknow | 02/09/24 |
| 10 | Prof. Seetha Laxmi Department of Electrical Engineering I.E.T. Lucknow | |
| 11 | Prof. Anurag Tripathi Department of Electrical Engineering I.E.T. Lucknow | |
| 12 | Prof. Sanjay Medhavi Department of Business Administration Lucknow University Lucknow | |
| 13 | Prof. Nagendra Yadav Department of Business Administration DSMNRU Lucknow | 02/09/24 |
| 14 | Prof. R.P. Singh Department of English Lucknow University Lucknow | |
| 15 | Dr. Pragti Shukla Department of English I.T. College Lucknow | |
| 16 | Er. Ashish Shukla ZINITY Services Pvt. Ltd. Gurugram Haryana. | |
| 17 | Mr. Vikas Saxena (Guardian, Special Invitee) | |
| 18 | Er. Sheetal Saini Former B.Tech. Computer Science & Engineering Student (Special Invitee) | |
| 19 | Mr. Kushagra Saxena Student, B.Tech. CSE (AI & ML) (Fourth Year), (Special Invitee) | |



MINUTES OF THE BOARD OF STUDIES MEETING HELD ON 2nd SEPTEMBER, 2024

Department of Applied Science and Humanities

Faculty of Engineering & Technology

Minutes

The Board of Studies (BoS) meeting of the Department of Applied Science and Humanities was held in Administrative Block on 2nd Sept 2024 at 02:00 PM.

The following members were present:

Internal Members:

1. Prof. Syed Haider Ali - Chairperson
2. Dr. Rajendra Kumar Tripathi- Convener
3. Dr. Suman Kumar Mishra- Coordinator
4. Dr. Shavej Ali Siddiqui-Member
5. Dr. Abhay Krishna-Member
6. Mr. Apratim Chatterji-Member

External Members:

1. Prof. R.S. Gupta (Retd.)
2. Dr. S.N. Mishra
3. Prof. O.P Singh
4. Dr. Santosh Kumar Singh
5. Prof. Subodh Wariya
6. Prof. Manoj Shukla
7. Prof. Sanjay Singh
8. Prof. Sanjay Srivastava
9. Prof. Seetha Laxmi
10. Prof. Anurag Tripathi
11. Prof. Sanjay Medhavi
12. Prof. Nagendra Yadav
13. Prof. R.P. Singh
14. Dr. Pragti Shukla



Special Invitee:

1. Dr. R.R. Awashti
2. Dr. B.B. Nath
3. Dr. Balram Prajapati
4. Mrs. Laxmi Mishra

Prof. Syed Haider Ali, Chairperson (BoS), chaired the meeting and welcomed the external and internal members. He introduced the external members to the internal members. The following agenda items were discussed:

Agenda No. 1: Discussion and approval of the Study Evaluation Scheme/Syllabi for B. Tech First Year Programme.

Approved

Agenda No. 2: Discussion and approval of the Study Evaluation Scheme/Syllabi for Humanities Papers.

Approved

Agenda No. 3: Discussion and Approval of Laboratory Syllabi for Department of Applied Science and Humanities.

Approved

Agenda No. 4: Any other discussions/suggestions related to the academic development of the University.

Approved

SMC
Dr. R.R. Awashti
02/09/24
Dr. B.B. Nath
02/09/24
Dr. Balram Prajapati
2-9-2024
Mrs. Laxmi Mishra
02/09/24
Prof. Syed Haider Ali
02/09/24
Dr. R.R. Awashti
02/09/24
Dr. B.B. Nath
02/09/24
Dr. Balram Prajapati
02/09/24
Mrs. Laxmi Mishra
02/09/24
Prof. Syed Haider Ali
02/09/24



STUDY & EVALUATION SCHEME

B.Tech. Biotechnology (BT)

I Year: I Semester

| S. No. | Subject Code | Subject name | L | T | P | Sessional Assessment | | | SEE | Subject Total | Credit |
|---------------------------------|--------------|-----------------------------------|-----------|----------|----------|----------------------|----|-------|-----|---------------|-----------|
| | | | | | | MST | TA | Total | | | |
| THEORY SUBJECT | | | | | | | | | | | |
| 1 | TBS101 | Elementary Mathematics - I | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 2 | TAS102 | Engineering Physics | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 3 | TBT101 | Introduction of Biotechnology - I | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 4 | THM101 | Design Thinking | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 5 | TME101 | Engineering Mechanics | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 6 | TES101 | Environmental Science | 2 | 0 | 0 | 15 | 15 | 30 | 70 | 100 | 0 |
| 7 | TGP101 | General Proficiency | - | - | - | - | - | 50 | 0 | 50 | 0 |
| PRACTICAL/DESIGN/DRAWING | | | | | | | | | | | |
| 8 | TAS152 | Engineering Physics Lab | 0 | 0 | 2 | 15 | 15 | 30 | 70 | 100 | 1 |
| 9 | TBT151 | Biotechnology - I Lab | 0 | 0 | 2 | 15 | 15 | 30 | 70 | 100 | 1 |
| 10 | TME151 | Engineering Mechanics Lab | 0 | 0 | 2 | 15 | 15 | 30 | 70 | 100 | 1 |
| 11 | TCT151 | Engineering Graphics & Design Lab | 0 | 0 | 2 | 15 | 15 | 30 | 70 | 100 | 1 |
| Total | | | 17 | 5 | 8 | | | | | 1000 | 24 |

L- Lecture
T- Tutorial
P- Practical
MST- Mid Semester Test
TA- Teacher's Assessment
SEE- Semester End Examination

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STUDY & EVALUATION SCHEME

B.Tech. Civil Engineering (CE)

I Year: I Semester

| S. No. | Subject Code | Subject name | L | T | P | Sessional Assessment | | | SEE | Subject Total | Credit |
|---------------------------------|--------------|-------------------------------------|-----------|----------|----------|----------------------|----|-------|-----|---------------|-----------|
| | | | | | | MST | TA | Total | | | |
| THEORY SUBJECT | | | | | | | | | | | |
| 1 | TAS101 | Engineering Mathematics - I | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 2 | AS103 | Engineering Chemistry | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 3 | TEC101 | Electronics Engineering | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 4 | TCS101 | Programming for Problem Solving | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 5 | TME101 | Manufacturing Process | 2 | 0 | 0 | 15 | 15 | 30 | 70 | 100 | 2 |
| 6 | THM102 | Professional Communication | 2 | 0 | 0 | 15 | 15 | 30 | 70 | 100 | 2 |
| 7 | TGP101 | General Proficiency | - | - | - | - | - | 50 | 0 | 50 | 0 |
| PRACTICAL/DESIGN/DRAWING | | | | | | | | | | | |
| 8 | AS153 | Engineering Chemistry Lab | 0 | 0 | 2 | 15 | 15 | 30 | 70 | 100 | 1 |
| 9 | TEC151 | Electronics Engineering Lab | 0 | 0 | 2 | 15 | 15 | 30 | 70 | 100 | 1 |
| 10 | TCS151 | Programming for Problem Solving Lab | 0 | 0 | 2 | 15 | 15 | 30 | 70 | 100 | 1 |
| 11 | TME152 | Workshop Practices | 0 | 0 | 2 | 15 | 15 | 30 | 70 | 100 | 1 |
| 12 | THM151 | Soft Skill Lab | 0 | 0 | 2 | 0 | 20 | 20 | 30 | 50 | 0 |
| Total | | | 16 | 4 | 8 | | | | | 1000 | 24 |

L- Lecture
T- Tutorial
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MST- Mid Semester Test
TA- Teacher's Assessment
SEE- Semester End Examination

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Sanku 02/09/24



STUDY & EVALUATION SCHEME

B.Tech. Computer Science and Engineering

I Year: I Semester

| S. No. | Subject Code | Subject name | L | T | P | Sessional Assessment | | | SEE | Subject Total | Credit |
|---------------------------------|--------------|-----------------------------------|-----------|----------|----------|----------------------|----|-------|-----|---------------|-----------|
| | | | | | | MST | TA | Total | | | |
| THEORY SUBJECT | | | | | | | | | | | |
| 1 | TAS101 | Engineering Mathematics - I | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 2 | TAS102 | Engineering Physics | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 3 | TEE101 | Electrical Engineering | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 4 | THM101 | Design Thinking | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 5 | TME101 | Engineering Mechanics | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 6 | TES101 | Environmental Science | 2 | 0 | 0 | 15 | 15 | 30 | 70 | 100 | 0 |
| 7 | TGP101 | General Proficiency | - | - | - | - | - | 50 | 0 | 50 | 0 |
| PRACTICAL/DESIGN/DRAWING | | | | | | | | | | | |
| 8 | TAS152 | Engineering Physics Lab | 0 | 0 | 2 | 15 | 15 | 30 | 70 | 100 | 1 |
| 9 | TEE151 | Electrical Engineering Lab | 0 | 0 | 2 | 15 | 15 | 30 | 70 | 100 | 1 |
| 10 | TME151 | Engineering Mechanics Lab | 0 | 0 | 2 | 15 | 15 | 30 | 70 | 100 | 1 |
| 11 | TCE151 | Engineering Graphics & Design Lab | 0 | 0 | 2 | 15 | 15 | 30 | 70 | 100 | 1 |
| Total | | | 17 | 5 | 8 | | | | | 1000 | 24 |

L- Lecture
 T- Tutorial
 P- Practical
 MST- Mid Semester Test
 TA- Teacher's Assessment
 SEE- Semester End Examination

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STUDY & EVALUATION SCHEME

B.Tech. Computer Science and Engineering (Artificial Intelligence & Data Science)

I Year: I Semester

| S. No. | Subject Code | Subject name | L | T | P | Sessional Assessment | | | SEE | Subject Total | Credit |
|---------------------------------|--------------|-------------------------------------|-----------|----------|----------|----------------------|----|-------|-----|---------------|-----------|
| | | | | | | MST | TA | Total | | | |
| THEORY SUBJECT | | | | | | | | | | | |
| 1 | TAS101 | Engineering Mathematics - I | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 2 | AS103 | Engineering Chemistry | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 3 | TEC101 | Electronics Engineering | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 4 | TCS101 | Programming for Problem Solving | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 5 | TME102 | Manufacturing Process | 2 | 0 | 0 | 15 | 15 | 30 | 70 | 100 | 2 |
| 6 | THM102 | Professional Communication | 2 | 0 | 0 | 15 | 15 | 30 | 70 | 100 | 2 |
| 7 | TGP101 | General Proficiency | - | - | - | - | - | 50 | 0 | 50 | 0 |
| PRACTICAL/DESIGN/DRAWING | | | | | | | | | | | |
| 8 | AS153 | Engineering Chemistry Lab | 0 | 0 | 2 | 15 | 15 | 30 | 70 | 100 | 1 |
| 9 | TEC151 | Electronics Engineering Lab | 0 | 0 | 2 | 15 | 15 | 30 | 70 | 100 | 1 |
| 10 | TCS151 | Programming for Problem Solving Lab | 0 | 0 | 2 | 15 | 15 | 30 | 70 | 100 | 1 |
| 11 | TME152 | Workshop Practices | 0 | 0 | 2 | 15 | 15 | 30 | 70 | 100 | 1 |
| 12 | THM151 | Soft Skill Lab | 0 | 0 | 2 | 0 | 20 | 20 | 30 | 50 | 0 |
| | | Total | 16 | 4 | 8 | | | | | 1000 | 24 |

L- Lecture
T- Tutorial
P- Practical
MST- Mid Semester Test
TA- Teacher's Assessment
SEE- Semester End Examination

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STUDY & EVALUATION SCHEME

B.Tech. Computer Science and Engineering (Artificial Intelligence & Machine Learning)

I Year: I Semester

| S. No. | Subject Code | Subject name | L | T | P | Sessional Assessment | | | SEE | Subject Total | Credit |
|---------------------------------|--------------|-----------------------------------|-----------|----------|----------|----------------------|----|-------|-----|---------------|-----------|
| | | | | | | MST | TA | Total | | | |
| THEORY SUBJECT | | | | | | | | | | | |
| 1 | TAS101 | Engineering Mathematics - I | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 2 | TAS102 | Engineering Physics | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 3 | TEE101 | Electrical Engineering | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 4 | THM101 | Design Thinking | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 5 | TME101 | Engineering Mechanics | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 6 | TES101 | Environmental Science | 2 | 0 | 0 | 15 | 15 | 30 | 70 | 100 | 0 |
| 7 | TGP101 | General Proficiency | - | - | - | - | - | 50 | 0 | 50 | 0 |
| PRACTICAL/DESIGN/DRAWING | | | | | | | | | | | |
| 8 | TAS152 | Engineering Physics Lab | 0 | 0 | 2 | 15 | 15 | 30 | 70 | 100 | 1 |
| 9 | TEE151 | Electrical Engineering Lab | 0 | 0 | 2 | 15 | 15 | 30 | 70 | 100 | 1 |
| 10 | TME151 | Engineering Mechanics Lab | 0 | 0 | 2 | 15 | 15 | 30 | 70 | 100 | 1 |
| 11 | TCE151 | Engineering Graphics & Design Lab | 0 | 0 | 2 | 15 | 15 | 30 | 70 | 100 | 1 |
| Total | | | 17 | 5 | 8 | | | | | 1000 | 24 |

L- Lecture
T- Tutorial
P- Practical
MST- Mid Semester Test
TA- Teacher's Assessment
SEE- Semester End Examination

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STUDY & EVALUATION SCHEME

B.Tech. Mechanical Engineering (ME)

I Year: I Semester

| S. No. | Subject Code | Subject name | L | T | P | Sessional Assessment | | | SEE | Subject Total | Credit |
|---------------------------------|--------------|-------------------------------------|-----------|----------|----------|----------------------|----|-------|-----|---------------|-----------|
| | | | | | | MST | TA | Total | | | |
| THEORY SUBJECT | | | | | | | | | | | |
| 1 | TAS101 | Engineering Mathematics - I | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 2 | AS103 | Engineering Chemistry | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 3 | TEC101 | Electronics Engineering | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 4 | TCS101 | Programming for Problem Solving | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 5 | TME102 | Manufacturing Process | 2 | 0 | 0 | 15 | 15 | 30 | 70 | 100 | 2 |
| 6 | THM102 | Professional Communication | 2 | 0 | 0 | 15 | 15 | 30 | 70 | 100 | 2 |
| 7 | TGP101 | General Proficiency | - | - | - | - | - | 50 | 0 | 50 | 0 |
| PRACTICAL/DESIGN/DRAWING | | | | | | | | | | | |
| 8 | AS153 | Engineering Chemistry Lab | 0 | 0 | 2 | 15 | 15 | 30 | 70 | 100 | 1 |
| 9 | TEC151 | Electronics Engineering Lab | 0 | 0 | 2 | 15 | 15 | 30 | 70 | 100 | 1 |
| 10 | TCS151 | Programming for Problem Solving Lab | 0 | 0 | 2 | 15 | 15 | 30 | 70 | 100 | 1 |
| 11 | TME152 | Workshop Practices | 0 | 0 | 2 | 15 | 15 | 30 | 70 | 100 | 1 |
| 11 | THM151 | Soft Skill Lab | 0 | 0 | 2 | 0 | 20 | 20 | 30 | 50 | 0 |
| Total | | | 16 | 4 | 8 | | | | | 1000 | 24 |

L-Lecture
T-Tutorial
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MST-Mid Semester Test
TA-Teacher's Assessment
SEE-Semester End Examination

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STUDY & EVALUATION SCHEME

B.Tech. Automation and Robotics (AR)

I Year: I Semester

| S. No. | Subject Code | Subject name | L | T | P | Sessional Assessment | | | SEE | Subject Total | Credit |
|---------------------------------|--------------|-------------------------------------|-----------|----------|----------|----------------------|----|-------|-----|---------------|-----------|
| | | | | | | MST | TA | Total | | | |
| THEORY SUBJECT | | | | | | | | | | | |
| 1 | TAS101 | Engineering Mathematics - I | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 2 | AS103 | Engineering Chemistry | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 3 | TEC101 | Electronics Engineering | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 4 | TCS101 | Programming for Problem Solving | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 5 | TME102 | Manufacturing Process | 2 | 0 | 0 | 15 | 15 | 30 | 70 | 100 | 2 |
| 6 | THM102 | Professional Communication | 2 | 0 | 0 | 15 | 15 | 30 | 70 | 100 | 2 |
| 7 | TGIP101 | General Proficiency | - | - | - | - | - | 50 | 0 | 50 | 0 |
| PRACTICAL/DESIGN/DRAWING | | | | | | | | | | | |
| 8 | AS153 | Engineering Chemistry Lab | 0 | 0 | 2 | 15 | 15 | 30 | 70 | 100 | 1 |
| 9 | TEC151 | Electronics Engineering Lab | 0 | 0 | 2 | 15 | 15 | 30 | 70 | 100 | 1 |
| 10 | TCS151 | Programming for Problem Solving Lab | 0 | 0 | 2 | 15 | 15 | 30 | 70 | 100 | 1 |
| 11 | TME152 | Workshop Practices | 0 | 0 | 2 | 15 | 15 | 30 | 70 | 100 | 1 |
| 12 | THM151 | Soft Skill Lab | 0 | 0 | 2 | 0 | 20 | 20 | 30 | 50 | 0 |
| | | Total | 16 | 4 | 8 | | | | | 1000 | 24 |

L- Lecture
T- Tutorial
P- Practical
MST- Mid Semester Test
TA- Teacher's Assessment
SEE- Semester End Examination

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STUDY & EVALUATION SCHEME

B.Tech. Biotechnology (BT)

I Year: II Semester

| S. No. | Subject Code | Subject name | L | T | P | Sessional Assessment | | | SEE | Subject Total | Credit |
|---------------------------------|--------------|-------------------------------------|-----------|----------|----------|----------------------|----|-------|-----|---------------|-----------|
| | | | | | | MST | TA | Total | | | |
| THEORY SUBJECT | | | | | | | | | | | |
| 1 | IBS200 | Elementary Mathematics - II | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 2 | AS303 | Engineering Chemistry | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 3 | TBT701 | Introduction of Biotechnology - II | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 4 | ICS202 | Programming for Problem Solving | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 5 | IME202 | Manufacturing Process | 2 | 0 | 0 | 15 | 15 | 30 | 70 | 100 | 2 |
| 6 | THM202 | Professional Communication | 2 | 0 | 0 | 15 | 15 | 30 | 70 | 100 | 2 |
| 7 | IGP201 | General Proficiency | - | - | - | - | - | 50 | 0 | 50 | 0 |
| PRACTICAL/DESIGN/DRAWING | | | | | | | | | | | |
| 8 | AS253 | Engineering Chemistry Lab | 0 | 0 | 2 | 15 | 15 | 30 | 70 | 100 | 1 |
| 9 | TBT251 | Biotechnology - II Lab | 0 | 0 | 2 | 15 | 15 | 30 | 70 | 100 | 1 |
| 10 | ICS254 | Programming for Problem Solving Lab | 0 | 0 | 2 | 15 | 15 | 30 | 70 | 100 | 1 |
| 11 | IME252 | Workshop Practices | 0 | 0 | 2 | 15 | 15 | 30 | 70 | 100 | 1 |
| 12 | THM251 | Soft Skill Lab | 0 | 0 | 2 | 0 | 20 | 20 | 30 | 50 | 0 |
| | | Total | 16 | 4 | 8 | | | | | 1000 | 24 |

L- Lecture
T- Tutorial
P-Practical
MST- Mid Semester Test
TA- Teacher's Assessment
SEE- Semester end Examination

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STUDY & EVALUATION SCHEME

B.Tech. Biotechnology (BT)

I Year: II Semester

| S. No. | Subject Code | Subject name | L | T | P | Sessional Assessment | | | SEE | Subject Total | Credit |
|---------------------------------|--------------|-------------------------------------|-----------|----------|----------|----------------------|----|-------|-----|---------------|-----------|
| | | | | | | MST | TA | Total | | | |
| THEORY SUBJECT | | | | | | | | | | | |
| 1 | TBS201 | Elementary Mathematics - II | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 2 | AS203 | Engineering Chemistry | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 3 | TBT204 | Introduction of Biotechnology - II | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 4 | TCS205 | Programming for Problem Solving | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 5 | TMI202 | Manufacturing Process | 2 | 0 | 0 | 15 | 15 | 30 | 70 | 100 | 2 |
| 6 | TDM202 | Professional Communication | 2 | 0 | 0 | 15 | 15 | 30 | 70 | 100 | 2 |
| 7 | TGP201 | General Proficiency | - | - | - | - | - | 50 | 0 | 50 | 0 |
| PRACTICAL/DESIGN/DRAWING | | | | | | | | | | | |
| 8 | AS251 | Engineering Chemistry Lab | 0 | 0 | 2 | 15 | 15 | 30 | 70 | 100 | 1 |
| 9 | TBT251 | Biotechnology - II Lab | 0 | 0 | 2 | 15 | 15 | 30 | 70 | 100 | 1 |
| 10 | TCS251 | Programming for Problem Solving Lab | 0 | 0 | 2 | 15 | 15 | 30 | 70 | 100 | 1 |
| 11 | TMI252 | Workshop Practices | 0 | 0 | 2 | 15 | 15 | 30 | 70 | 100 | 1 |
| 12 | TDM251 | Soft Skill Lab | 0 | 0 | 2 | 0 | 20 | 20 | 30 | 50 | 0 |
| | | Total | 16 | 4 | 8 | | | | | 1000 | 24 |

L-Lecture

T-Tutorial

P-Practical

MST-Mid Semester Test

TA-Teacher's Assessment

SEE-Semester End

Examination

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STUDY & EVALUATION SCHEME

B.Tech. Civil Engineering (CE)

I Year: II Semester

| S. No. | Subject Code | Subject name | L | T | P | Sessional Assessment | | | SEE | Subject Total | Credit |
|---------------------------------|--------------|-----------------------------------|-----------|----------|----------|----------------------|----|-------|-----|---------------|-----------|
| | | | | | | MST | TA | Total | | | |
| THEORY SUBJECT | | | | | | | | | | | |
| 1 | TAS201 | Engineering Mathematics - II | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 2 | TAS202 | Engineering Physics | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 3 | TEE201 | Electrical Engineering | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 4 | THM201 | Design Thinking | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 5 | TME201 | Engineering Mechanics | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 6 | TES201 | Environmental Science | 2 | 0 | 0 | 15 | 15 | 30 | 70 | 100 | 0 |
| 7 | TGP201 | General Proficiency | - | - | - | - | - | 50 | 0 | 50 | 0 |
| PRACTICAL/DESIGN/DRAWING | | | | | | | | | | | |
| 8 | TAS252 | Engineering Physics Lab | 0 | 0 | 2 | 15 | 15 | 30 | 70 | 100 | 1 |
| 9 | TEE251 | Electrical Engineering Lab | 0 | 0 | 2 | 15 | 15 | 30 | 70 | 100 | 1 |
| 10 | TME251 | Engineering Mechanics Lab | 0 | 0 | 2 | 15 | 15 | 30 | 70 | 100 | 1 |
| 11 | TCE251 | Engineering Graphics & Design Lab | 0 | 0 | 2 | 15 | 15 | 30 | 70 | 100 | 1 |
| Total | | | 17 | 5 | 8 | | | | | 1000 | 24 |

L- Lecture
T- Tutorial
P- Practical
MST- Mid Semester Test
TA- Teacher's Assessment
SEE- Semester End Examination

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STUDY & EVALUATION SCHEME

B.Tech. Computer Science and Engineering

I Year: II Semester

| S. No. | Subject Code | Subject name | L | T | P | Sessional Assessment | | | SEE | Subject Total | Credit |
|---------------------------------|--------------|-------------------------------------|-----------|----------|----------|----------------------|----|-------|-----|---------------|-----------|
| | | | | | | MST | TA | Total | | | |
| THEORY SUBJECT | | | | | | | | | | | |
| 1 | TAS201 | Engineering Mathematics - II | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 2 | AS203 | Engineering Chemistry | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 3 | TEC201 | Electronics Engineering | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 4 | TCS201 | Programming for Problem Solving | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 5 | TME202 | Manufacturing Process | 2 | 0 | 0 | 15 | 15 | 30 | 70 | 100 | 2 |
| 6 | THM202 | Professional Communication | 2 | 0 | 0 | 15 | 15 | 30 | 70 | 100 | 2 |
| 7 | TGP201 | General Proficiency | - | - | - | - | - | 50 | 0 | 50 | 0 |
| PRACTICAL/DESIGN/DRAWING | | | | | | | | | | | |
| 8 | AS253 | Engineering Chemistry Lab | 0 | 0 | 2 | 15 | 15 | 30 | 70 | 100 | 1 |
| 9 | TEC251 | Electronics Engineering Lab | 0 | 0 | 2 | 15 | 15 | 30 | 70 | 100 | 1 |
| 10 | TCS251 | Programming for Problem Solving Lab | 0 | 0 | 2 | 15 | 15 | 30 | 70 | 100 | 1 |
| 11 | TME252 | Workshop Practices | 0 | 0 | 2 | 15 | 15 | 30 | 70 | 100 | 1 |
| 12 | THM251 | Soft Skill Lab | 0 | 0 | 2 | 0 | 20 | 20 | 30 | 50 | 0 |
| | | Total | 16 | 4 | 8 | | | | | 1000 | 24 |

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 T- Tutorial
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 MST- Mid Semester Test
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STUDY & EVALUATION SCHEME

B.Tech. Computer Science and Engineering (Artificial Intelligence & Data Science)

I Year: II Semester

| S. No. | Subject Code | Subject name | L | T | P | Sessional Assessment | | | SEE | Subject Total | Credit |
|---------------------------------|--------------|-----------------------------------|-----------|----------|----------|----------------------|----|-------|-----|---------------|-----------|
| | | | | | | MST | TA | Total | | | |
| THEORY SUBJECT | | | | | | | | | | | |
| 1 | IAS201 | Engineering Mathematics - II | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 2 | IAS202 | Engineering Physics | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 3 | TEE201 | Electrical Engineering | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 4 | THM201 | Design Thinking | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 5 | TME201 | Engineering Mechanics | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 6 | TES201 | Environmental Science | 2 | 0 | 0 | 15 | 15 | 30 | 70 | 100 | 0 |
| 7 | TGP201 | General Proficiency | - | - | - | - | - | 50 | 0 | 50 | 0 |
| PRACTICAL/DESIGN/DRAWING | | | | | | | | | | | |
| 8 | TAS252 | Engineering Physics Lab | 0 | 0 | 2 | 15 | 15 | 30 | 70 | 100 | 1 |
| 9 | TEE251 | Electrical Engineering Lab | 0 | 0 | 2 | 15 | 15 | 30 | 70 | 100 | 1 |
| 10 | TME251 | Engineering Mechanics Lab | 0 | 0 | 2 | 15 | 15 | 30 | 70 | 100 | 1 |
| 11 | TCE251 | Engineering Graphics & Design Lab | 0 | 0 | 2 | 15 | 15 | 30 | 70 | 100 | 1 |
| | | Total | 17 | 5 | 8 | | | | | 1000 | 24 |

L- Lecture
T- Tutorial
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MST- Mid Semester Test
TA-Teacher's Assessment
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STUDY & EVALUATION SCHEME

B.Tech. Computer Science and Engineering (Artificial Intelligence & Machine Learning)

I Year: II Semester

| S. No. | Subject Code | Subject name | L | T | P | Sessional Assessment | | | SEE | Subject Total | Credit |
|---------------------------------|--------------|-------------------------------------|-----------|----------|----------|----------------------|----|-------|-----|---------------|-----------|
| | | | | | | MST | TA | Total | | | |
| THEORY SUBJECT | | | | | | | | | | | |
| 1 | TAS201 | Engineering Mathematics - II | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 2 | AS203 | Engineering Chemistry | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 3 | TEC201 | Electronics Engineering | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 4 | TCS202 | Programming for Problem Solving | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 5 | TMI-202 | Manufacturing Process | 2 | 0 | 0 | 15 | 15 | 30 | 70 | 100 | 2 |
| 6 | THM202 | Professional Communication | 2 | 0 | 0 | 15 | 15 | 30 | 70 | 100 | 2 |
| 7 | TGP201 | General Proficiency | - | - | - | - | - | 50 | 0 | 50 | 0 |
| PRACTICAL/DESIGN/DRAWING | | | | | | | | | | | |
| 8 | AS253 | Engineering Chemistry Lab | 0 | 0 | 2 | 15 | 15 | 30 | 70 | 100 | 1 |
| 9 | TEC251 | Electronics Engineering Lab | 0 | 0 | 2 | 15 | 15 | 30 | 70 | 100 | 1 |
| 10 | TCS251 | Programming for Problem Solving Lab | 0 | 0 | 2 | 15 | 15 | 30 | 70 | 100 | 1 |
| 11 | ME252 | Workshop Practices | 0 | 0 | 2 | 15 | 15 | 30 | 70 | 100 | 1 |
| 12 | THM251 | Soft Skill Lab | 0 | 0 | 2 | 0 | 20 | 20 | 30 | 50 | 0 |
| Total | | | 16 | 4 | 8 | | | | | 1000 | 24 |

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T-Tutorial
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SEE- Semester End Examination

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STUDY & EVALUATION SCHEME

B.Tech. Mechanical Engineering (ME)

I Year: II Semester

| S. No. | Subject Code | Subject name | L | T | P | Sessional Assessment | | | SEE | Subject Total | Credit |
|---------------------------------|--------------|-----------------------------------|-----------|----------|----------|----------------------|----|-------|-----|---------------|-----------|
| | | | | | | MST | TA | Total | | | |
| THEORY SUBJECT | | | | | | | | | | | |
| 1 | TAS201 | Engineering Mathematics - II | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 2 | TAS202 | Engineering Physics | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 3 | TEE201 | Electrical Engineering | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 4 | IHM201 | Design Thinking | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 5 | TME201 | Engineering Mechanics | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 6 | TES201 | Environmental Science | 2 | 0 | 0 | 15 | 15 | 30 | 70 | 100 | 0 |
| 7 | TGP201 | General Proficiency | - | - | - | - | - | 50 | 0 | 50 | 0 |
| PRACTICAL/DESIGN/DRAWING | | | | | | | | | | | |
| 8 | TAS252 | Engineering Physics Lab | 0 | 0 | 2 | 15 | 15 | 30 | 70 | 100 | 1 |
| 9 | TEE251 | Electrical Engineering Lab | 0 | 0 | 2 | 15 | 15 | 30 | 70 | 100 | 1 |
| 10 | TME251 | Engineering Mechanics Lab | 0 | 0 | 2 | 15 | 15 | 30 | 70 | 100 | 1 |
| 11 | TCE251 | Engineering Graphics & Design Lab | 0 | 0 | 2 | 15 | 15 | 30 | 70 | 100 | 1 |
| Total | | | 17 | 5 | 8 | | | | | 1000 | 24 |

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STUDY & EVALUATION SCHEME

B.Tech. Automation and Robotics (AR)

I Year: II Semester

| S. No. | Subject Code | Subject name | L | T | P | Sessional Assessment | | | SEE | Subject Total | Credit |
|---------------------------------|--------------|-----------------------------------|-----------|----------|----------|----------------------|----|-------|-----|---------------|-----------|
| | | | | | | MST | TA | Total | | | |
| THEORY SUBJECT | | | | | | | | | | | |
| 1 | TAS201 | Engineering Mathematics - II | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 2 | TAS202 | Engineering Physics | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 3 | TEE201 | Electrical Engineering | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 4 | IHM201 | Design Thinking | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 5 | TME201 | Engineering Mechanics | 3 | 1 | 0 | 15 | 15 | 30 | 70 | 100 | 4 |
| 6 | TES201 | Environmental Science | 2 | 0 | 0 | 15 | 15 | 30 | 70 | 100 | 0 |
| 7 | TGP201 | General Proficiency | - | - | - | - | - | 50 | 0 | 50 | 0 |
| PRACTICAL/DESIGN/DRAWING | | | | | | | | | | | |
| 8 | TAS252 | Engineering Physics Lab | 0 | 0 | 2 | 15 | 15 | 30 | 70 | 100 | 1 |
| 9 | TEE251 | Electrical Engineering Lab | 0 | 0 | 2 | 15 | 15 | 30 | 70 | 100 | 1 |
| 10 | TME251 | Engineering Mechanics Lab | 0 | 0 | 2 | 15 | 15 | 30 | 70 | 100 | 1 |
| 11 | TCE251 | Engineering Graphics & Design Lab | 0 | 0 | 2 | 15 | 15 | 30 | 70 | 100 | 1 |
| Total | | | 17 | 5 | 8 | | | | | 1000 | 24 |

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स्वाजा मुईनुद्दीन चिश्ती भाषा विश्वविद्यालय, लखनऊ, उत्तर प्रदेश (भारत)

Khwaja Moinuddin Chishti Language University, Lucknow, U.P. (India)

U.P. STATE GOVERNMENT UNIVERSITY,

(Recognised Under Section 2(f) & 12(B) of the UGC Act, 1956 & B.Tech. Approved by (AICTE))

Date: 02/09/2024

Syllabus

B. Tech-1st Year (for all branches)

ENGINEERING CHEMISTRY

AS-101(T)

Unit-I:

- ❖ Chemical Bonding: Orbital concepts in bonding, Valence bond and Molecular Orbital theory, M.O. diagrams of homonuclear and heteronuclear diatomic molecules, Weak Interactions- Hydrogen bonding, and Vander Waal's interactions.
- ❖ Green Chemistry- 12 principles of green chemistry, routine and green synthesis of paracetamol.
- ❖ Liquid crystals: Classifications and applications.
- ❖ Structure and applications of Graphite and fullerenes.

Unit-II: Polymers

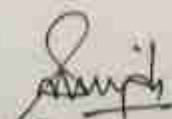
- ❖ Classification of polymers, polymerization processes.
- ❖ Structure-property relationship, preparation and application of some industrially important polymers (Natural rubber, Buna N, Buna S, Nylon 6, Nylon 6 6, Terylene, PVC, PVA, PF, UF, HDPE, LDPE) High performance polymers and epoxy resins.
- ❖ Conducting polymers, conduction mechanism of polyacetylene, Doping of conducting polymers, Applications
- ❖ Biodegradable polymer, Polymer blends and polymers composites,

Unit-III: Water Chemistry

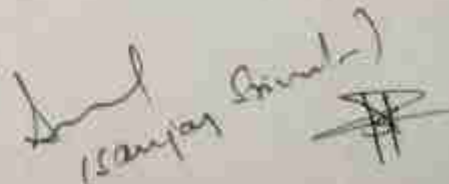
- ❖ Sources of Drinking water, Impurities in water, Dissolved Oxygen (DO) in water and its importance,
- ❖ Biological Oxygen Demand (BOD), Chemical Oxygen Demand(COD),
- ❖ Hardness of water, Types of hardness. Water treatment process- Lime-soda, Zeolite, ion-exchange resin, reverse osmosis, Boiler feed water.

Unit-IV: Fuels and Combustion

- ❖ Definition and Classification of Fuels, Characteristic of good fuel, Hydrocarbon Fuels, Calorific values(CV) of fuel, Determination of CV, Analysis of Coal, Chemical process of petroleum, Petrol/Diesel knocking and Anti-knocking agents, Octane/Cetane number (CN), Unleaded petrol and Synthetic petrol.


(S.K. SINGH)




(Sanjay Singh)



ख्वाजा मुईनुद्दीन चिश्ती भाषा विश्वविद्यालय, लखनऊ, उत्तर प्रदेश (भारत)
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Unit-V: Application of Spectroscopic Techniques

Basic working principle, and measurement technique and application of Infrared spectroscopy, Ultraviolet and visible spectroscopy, NMR spectroscopy.

Reference Books:

1. Concise Inorganic Chemistry, J.D.Lee, Chapman and Hall, London
2. A Text book of Physical Chemistry by K.L.Kapoor
3. A Textbook of Engineering Chemistry by Shashi Chawala

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Date: 01/09/2024

ENGINEERING CHEMISTRY

B.Tech-I Year (For all branches)

List of Experiments (Any 10 of following)

1. To estimate the strength of a given solution of $K_2Cr_2O_7$ using FAS as intermediate solution and N-phenyl anthranilic acid as internal indicator.
2. To estimate the strength of a given solution of FAS using $K_2Cr_2O_7$ as intermediate solution and potassium ferricyanide as external indicator.
3. To determine the pH at end point by titrating NaOH against oxalic acid.
4. To Estimate Hardness present in tap water.
5. To Estimate Alkalinity present in tap water.
6. To determine the viscosity of a given liquid (20% and 30% glycerol solution) at room temperature using Ostwald's Viscometer.
7. To prepare Bakelite.
8. To prepare Urea Formaldehyde resin.
9. To determine the chloride content of supplied water sample using Mohr's method.
10. To determine the DO of water sample.
11. To Determine the partition coefficient of acetic acid between n-butanol and water.
12. To estimate commercial caustic soda: Determination of the amounts of sodium carbonate and sodium hydroxide present together in the given commercial caustic soda.
13. To separate the mixture of amino acids by paper chromatography and calculate the R_f value.

(Sanjay Singh)

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Singh
(S.K. SINGH)

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Basic Science Courses
B.Tech First Year (Common to all branches)
Engineering Mathematics – I (Semester – I)
(TAS-101)

COURSE OBJECTIVE:

To make the students well versed with the concepts of linear algebra. The students should also be able to solve calculus and vector calculus – based problems.

COURSE CONTENTS:

Unit 1: Basic Calculus

Successive Differentiation (n^{th} order derivatives), Leibnitz theorem and its applications, Partial derivatives, total derivatives, Euler's theorem for homogeneous functions, Taylor's and MacLaurin's theorem for one & two variables.

Unit 2: Single – Variable Calculus (Differentiation)

Introduction to limits, Continuity and differentiability, Rolle's Theorem, Mean value theorems, Indeterminate forms and L'Hospital's rule, Maxima and Minima of function of several variables, Lagrange's Method of Multipliers.

Unit 3: Sequences and Series

Definition of sequence and series with examples, Convergence of sequence and series, Tests for convergence of series (Ratio test, D'Alembert's test, Raabe's test)

Unit 4: Multivariable Calculus (Differentiation)

Double integrals (cartesian), Change of order of integration in double integrals; Change of variables (cartesian), Triple integrals (cartesian); Applications of definite integrals to evaluate surface area and volume; Beta and Gamma functions, Dirichlet's integrals of three variables and its applications

Unit 5: Vector Calculus (Integration)

Gradient, Divergence, Curl and their physical interpretation, Directional derivatives, Line integral, Surface integral and Volume integral; Green's Theorem, Stoke's Theorem and Gauss – divergence Theorem and their applications (without proof)

Text Book /Suggested References:

1. G.B Thomas, R.L. Finney, Calculus and Analytic Geometry, Ninth Edition, Person Education, 2010
2. Reea Garg, Advanced Engineering Mathematics, Khanna Book Publishing Co., Delhi.
3. E. Kreyszig, Advanced Engineering Mathematics, Wiley 2015
4. Calculus and Analytic Geometry, G.B Thomas, R.L Finney, Person Education, 2010
5. B.V. Ramana, Higher engineering mathematics, Tata McGraw Hill Pvt. Ltd. New Delhi.
6. B.S.Grewal, Higher Engineering Mathematics BS Grewal 45th Edition, Khanna publishers.

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Basic Science Courses
B.Tech Biotechnology First Year (2024-25)
Elementary Mathematics – I (Semester – I)
(TBS-101)

COURSE OBJECTIVES:

The objective of this course is to familiarize the biotechnological engineers with techniques of Algebra, permutation and combinations, coordinate geometry, calculus and differentiability and its applications in the real world. It aims to equip the students with standard concepts and tools from intermediate to advanced level that will enable them to tackle more advanced levels of mathematics and applications that they would find useful in their disciplines.

COURSE CONTENTS:

Unit 1: Matrices

Definition of Matrix, Addition, Subtraction, Multiplication, Adjoint of a matrix, equality, Inverse of a matrix, rank of a matrix: Definition, Echelon form, Canonical form, System of Linear equations; Symmetric, Skew - symmetric and orthogonal matrices; Determinants, properties of Determinants.

Unit 2: Sequences and Series

Arithmetic progression (A.P.), general term of A.P., sum of series in A.P., arithmetic mean (A.M.), Geometric progression (G.P.), general term of a G.P., sum of n terms of a G.P., sum of infinite terms in G.P., geometric mean (G.M.), relation between A.M. and G.M., Sum to n terms of the special series n_1, n_2 and n_3 in A.P.

Unit 3: Coordinate Geometry

Straight Lines: Introduction, Slope of a line and angle between two lines. Various forms of equations of a line; parallel to axes, point – slope form, slope – intercept form, two-point form, intercepts form and normal form, General equation of a line, Distance of a point from a line, with numerical examples.

Unit 4: Calculus I

Introduction, Definition of limit, continuity and differentiability, derivative of sum, difference, product and quotient of functions. Derivatives of polynomial and trigonometric functions, exponential, logarithmic and parametric forms. Logarithmic differentiation. Derivative introduced as rate of change both as that of distance function.

Unit 5: Calculus II

Rolle's Theorem, Mean Value Theorem (without proof) and their geometric interpretations with illustrate examples. Applications of Derivatives: rate of change increasing /decreasing functions, tangents & normal, approximation of errors, Indeterminate form and L'Hospital rule; Maxima and minima of one variable.

Recommended Textbooks:

1. Mathematics – Textbook for class XI, NCERT Publication
2. Mathematics Part I – Textbook for class XII, NCERT Publication
3. Mathematics Part II – Textbook for class XII, NCERT Publication

Reference Books:

1. B.V. Ramana: Higher Engineering Mathematics (Tata MC Graw Hill).
2. Glynjames: Advanced modern Engineering Mathematics. (Pearson education)

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Basic Science Courses
B.Tech Biotechnology First Year
Elementary Mathematics – II (Semester – II)
(TBS-201)

COURSE OBJECTIVES:

The objective of this course is to familiarize the bio – technological engineers with techniques in multivariate integrals, Linear differential Equations, vector algebra, three – dimensional geometry and probability. It aims to equip the students to deal with advanced levels of mathematics and applications that would be essential for their disciplines.

COURSE CONTENTS:

Unit 1: Integrals

Integration of functions by substitution, partial fractions and by parts, only simple integrals of the type to be evaluated. Definite integrals as a limit of a sum, Fundamental Theorem of Calculus (without proof), Basic properties of definite integrals, Applications of Integrals: Applications in finding the area between simple curves, especially lines, areas of circles/parabolas/ellipses (in standard form only)

Unit 2: Differential equations

Definition, order and degree, general and particular solutions of a differential equation, Formation of differential equation whose general solution is given. Solution of differential equations by method of separation of variables, Homogeneous differential equations of first order and first degree, Solutions of differential equation of the type: $\frac{dy}{dx} + py = q$, where p and q are functions of x

Unit 3: Vector Algebra

Vectors and scalars, magnitude and direction of a vector, Direction cosines/ratios of vectors. Types of vectors (equal, unit, zero, parallel and collinear vectors), position vector of a point, negative of a vector, components of a vector, addition of vectors, multiplication of a vector by a scalar, position vector of a point dividing a line segment in a given ratio, Scalar (dot) product of vectors, projection of a vector on a line, Vector (cross) product of vectors.

Unit 4: Three – Dimensional Geometry

Three – Dimensional Geometry: Direction cosines/ratios of a line joining two points, Cartesian equation of a line, coplanar lines, shortest distance between two lines, Cartesian equation of a plane, Angle between two lines (b) two planes and (c) a line and a plane, Distance of a point from a plane.

Unit 5: Probability

Exhaustive events, Random experiments, trial and events, equally likely events, independent events, mutually exclusive events, compound events, favorable events, definition of probability, Axioms of probability, Addition theorem of probability with examples, Multiplication theorem of probability with illustrate examples, Conditional probability, Baye's theorem with examples.

Recommended Textbooks:

1. Mathematics – Textbook for class XI, NCERT Publication
2. Mathematics Part I – Textbook for class XII, NCERT Publication
3. Mathematics Part II – Textbook for class XII, NCERT Publication

Reference Books:

1. B.V. Ramana: Higher Engineering Mathematics (Tata MC Graw Hill).
2. Glynjames: Advanced modern Engineering Mathematics. (Pearson education)

Design Thinking Syllabus (THM 101/201)

COURSE OUTCOMES

| At the end of the course, the student will be able to understand | |
|--|--|
| CO 1: | To expose the student with state-of-the-art perspectives, ideas, concepts, and solutions related to the design and execution of projects using design thinking principles. |
| CO 2: | To prepare the mindset and discipline of systemic inspiration driven by a desire to identify new sources of ideas, and new models especially outside their regular working atmosphere. |
| CO 3: | To propose a concrete, feasible, viable and relevant innovation project/ challenge |
| CO 4: | To understand group discussion and product design. |
| CO 5: | To understand Feedback loop, rapid prototype & testing. |
| Unit | Topic |
| I | Understanding the Learning Process, Kolb's Learning Styles, Assessing and Interpreting, Remembering Memory, Understanding the Memory process, Problems in retention, Memory enhancement techniques, Experience & Expression Understanding Emotions: Experience & Expression, Assessing Empathy, Application with Peers. |
| II | Definition of Design Thinking, need for Design Thinking, Objective of Design Thinking, Concepts & Brainstorming, Stages of Design Thinking Process (explain with examples) – Being Ingenious & Fixing Problem: Empathize, Define, Ideate, Prototype, Test, Understanding Creative thinking process, Understanding Problem Solving, Testing Creative Problem Solving. |
| III | Process of Engineering Product Design, Design Thinking Approach, Stages of Product Design, Examples of best product designs and functions, Assignment – Engineering Product Design, Prototyping & Testing: Prototype and its need, Rapid Prototype Development process, Testing, Sample Example, Test Group Marketing. |
| IV | Individual differences & Uniqueness Group Discussion and Activities to encourage the understanding, acceptance and appreciation of Individual differences. Practical Examples of Customer Challenges, Use of Design Thinking to Enhance Customer Experience, Parameters of Product experience, Alignment of Customer Expectations with Product Design. |
| V | Feedback loop, Focus on User Experience, Address "ergonomic challenges, User focused design, rapid prototyping & testing, final product, Final Presentation – "Solving Practical Engineering Problem through Innovative Product Design & Creative Solution". |

Text Book (s):

1. Roger Martin, "The Design of Business: Why Design Thinking is the Next Competitive Advantage", Harvard Business Press, 2009.
2. Hasso Plattner, Christoph Meinel and Larry Leifer (eds), "Design Thinking: Understanding How to Work Like Designers", Springer, 2011
3. Idris Mootoo, "Design Thinking for Strategic Innovation: What They Can't Teach You at Business or Design School", John Wiley & Sons 2013
4. Jeanne Liedtka, Andrew King, Kevin Bennett, "Book - Solving Problems with Design Thinking - The Stories of What Works" (Columbia Business School Publishing), 2013
5. Mauricio Vianna, Yamar Vianna, Isabel K. Adler, Brenda Lucera, Beatriz Ruzin, "Design thinking: How to Innovate" MDV Press, 2011
6. Burgelman, Christensen, and Wheelwright, "Strategic Management of Technology and Innovation" 3rd Edition McGraw Hill Publications, 2017



 02/10/2024



ख्वाजा मुईनुद्दीन चिश्ती भाषा विश्वविद्यालय, लखनऊ, उत्तर प्रदेश (भारत)
Khwaja Moinuddin Chishti Language University, Lucknow, U.P. (India)

U.P. STATE GOVERNMENT UNIVERSITY,
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BASIC ELECTRICAL ENGINEERING (TEE- 101/202)

On completing this course, students will be able to:

1. Understand the basic network elements in electrical engineering
2. Apply the knowledge of theorems/laws to analyze the simple circuits
3. Understand the basics of AC circuits and apply the knowledge to analyze AC series and parallel circuits
4. Use the principles of electromagnetic induction in electrical applications

CO and PO mapping

| COs | Course Outcomes | Mapping COs with POs (High-3, Medium-2, Low-1) |
|-----|---|---|
| CO1 | Understand the basic network elements and apply the KCL and KVL for the analysis of circuits. | PO1(3), PO4(2) |
| CO2 | Apply the network theorems for analysis of DC circuits | PO2(3) |
| CO3 | Understand the fundamentals of single phase and three phase AC circuits and apply the knowledge to analyze single phase RLC circuits and three phase balanced circuits. | PO2(3), PO5(2) |
| CO4 | Explain the operating principle of single phase transformers with the background of magnetic circuits and analyze the transformer for generating equivalent circuit model, estimating the efficiency of the transformer | PO6 (2) |
| CO5 | Explain the principle of operation and applications of various electrical machines and understanding of basic electrical installations. | PO6 (2) |

UNIT I

Basic network elements: Basic circuit elements, Active and passive elements, Independent and dependent sources, Ideal and practical sources, Source transformation, Applications of KCL and KVL for circuit analysis.

UNIT II

DC Circuits: Superposition theorem, Thevenin's theorem, Norton's theorem, Maximum Power Transfer Theorem, Limitations and applications of Superposition, Thevenin's, Norton's and Maximum Power Transfer theorems with independent source only.

UNIT III

A.C. Fundamentals: Sinusoidal voltage and currents, phasor representation, concept of cycle period, frequency, instantaneous, peak, average, r.m.s. values, peak factor and form factor, phase difference, lagging, leading and in phase quantities.

AC Circuits: Analysis of AC circuits including R, L, C elements, wave form and relevant voltage current phasor diagrams, Resonance in series and parallel RLC circuit, Real, Reactive and Apparent power, Concept of power factor.

Three-phase AC system: Advantages of three phase system, Three phase balanced circuits, voltage and current relation in star and delta connections.

UNIT IV

Magnetic circuits: Faraday's law of electromagnetic induction, Induced e.m.f, Flux density and force on current carrying conductor, AC operation of Magnetic Circuits, Hysteresis and Eddy current losses, B-H curve.

Transformer: Principle of operation, Types and construction of single-phase transformers, emf equation, Ideal and practical transformer, Equivalent circuit, Losses, Efficiency and condition for maximum efficiency.

UNIT V

Fundamentals of Electrical Machines: Principle, Construction, Operation and Application of (i) DC Generator and Motor (ii) Single phase and Three phase Induction motor (iii) Three-phase synchronous generators.

Electrical installation: Switch fuse unit (SFU), MCB, MCCB, Types of wiring, Earthing and safety precautions.

Text /Reference Books:

1. D. C. Kulshreshtha, Basic Electrical Engineering, McGraw-Hill Education, 2019.
2. D.P. Kothari, Basic Electrical Engineering, McGraw-Hill Education, 2019.
3. P.V. Prasad, Basic Electrical Engineering, Cengage, 2019.
4. Edward Hughes, Electrical and Electronic Technology, Pearson, 2016.
5. Vincent Del Toro, Electrical Engineering Fundamentals, Pearson, Second Edition.





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Khwaja Moinuddin Chishti Language University, Lucknow, U.P. (India)

U.P. STATE GOVERNMENT UNIVERSITY.

(Recognized Under Section 2(f) & 12(B) of the UGC Act, 1956 & B.Tech., M.Tech. Approved by (AICTE))

ELECTRICAL LAB
(TEE 151/ 252)

List of Electrical Experiments (Minimum 10 experiments)

1. Application of KCL and KVL.
2. Verification of Superposition theorem.
3. Verification of Thevenin's theorem.
4. Verification of Norton's theorem.
5. Verification of Maximum power transfer theorem.
6. AC circuit analysis of R-L series and R-C series circuit.
7. Analysis of R-L-C series resonance circuit.
8. Analysis of R-L-C series parallel circuit.
9. Relationship between phase and line currents and voltages in 3- phase system (Star-Delta)
10. Power measurements in three phase system by two wattmeter method.
11. Study of analog and digital energy meter.
12. Study of SFC units.
13. Polarity test of single phase transformer.
14. Study of autotransformer.

Text /Reference Books:

1. D. C. Kulshreshtha, Basic Electrical Engineering, McGraw-Hill Education, 2019.
2. D.P. Kothari, Basic Electrical Engineering, McGraw-Hill Education, 2019.
3. P.V. Prasad, Basic Electrical Engineering, Cengage, 2019.
4. V.K Mehata, RohitMehta, Principles Electrical Engineering and Electronics, S Chand and Company, 2015.
5. B.L. Theraja, A Textbook of Electrical Technology, S Chand and Company, 2015.
6. Edward Hughes, Electrical and Electronic Technology, Pearson, 2016.

On completing this course, students will be able to:

- Analyze DC circuits using mesh, loop and also through application of network theorems, experimentally.
- Analyze the AC circuits consisting of RLC elements for resonance conditions, experimentally
- To measure the power consumption in three phase AC circuits and also will be able to conduct polarity test on transformer.
- Understand the basics of autotransformer, SFUs and energy meters.



ENGINEERING PHYSICS
(AS-202)

Course Outcomes: After the completion of courses, student will be able to,

CO1: Formulate and solve the engineering problems on electromagnetic field theory.

CO2: Explain the general scientific concepts of the relativistic mechanics.

CO3: Discuss the basic introductory Quantum mechanics.

CO4: Describe the concept of interference, diffraction & polarizations basic in the field of wave optics.

CO5: Explain basic concepts of laser working principals and their application in various processes.

| Unit | |
|------|---|
| | Electromagnetic Field Theory: Continuity equation for current density, Displacement current, Derivation of Poisson equations, Physical significance of magnetic monopoles. Modifying equation for the curl of magnetic field to satisfy continuity equation, Maxwell's equations in vacuum and in non-conducting medium, Energy in an electromagnetic field, Poynting vector and Poynting theorem, Plane electromagnetic waves in vacuum and their transverse nature. Relation between electric and magnetic fields of an electromagnetic wave in free space, Energy and momentum carried by electromagnetic waves, Resultant radiation pressure. |
| | Special Theory of Relativity: Frame of reference, Galilean transformation, Inertial and Non-inertial frames, Postulates of Special Theory of Relativity, Michelson-Morley experiment, Lorentz transformation of space and time, Length contraction, Time dilation, Simultaneity in relativity theory, Addition of velocities, Variation of mass with velocity, Equivalence of mass and energy, Momentum-energy transformation equations. |
| | Quantum Mechanics: Compton scattering, Wave-Particle duality, de-Broglie hypothesis, Wave function and its physical interpretation, Expectation and normalization values, Heisenberg's uncertainty principle, Time-dependent and time independent Schrodinger wave equations, Particle in infinity deep 1-D potential well |
| | Physical Optics: Interference- Conditions for observing sustained interference, Interference due to thin films, Wedge shaped thin film, Newton's rings. Diffraction- Fraunhofer's diffraction by single slit & double slit, Theory of plane transmission grating, Rayleigh' criterion of resolution, Resolving power of grating. Polarisation- Unpolarised, polarised lights, Polarisation by reflection, Double refraction by uniaxial crystals, Nicol prism, Optical activity, Specific rotation, Laurent half-shade and Biquartz polarimeters. |

Sankar

AKH

RANASTHA

AKH



Laser:

Characteristics of laser light, Absorption, Spontaneous emission, Stimulated emission, Einstein's coefficients, Relation between stimulated and spontaneous emission probabilities. Population inversion & pumping, Laser emission, Ruby laser (3 level), He-Ne gas laser (4 level), Laser applications.

Text Books/References:

1. AICTE's Prescribed Textbook: Physics (Quantum Mechanics for Engineers) with Lab Manual, Khanna Book Publishing Co.
2. Bhattacharya & Nag, Engineering Physics
3. Eisberg and Resnick, Introduction to Quantum Physics
4. D. J. Griffiths, Quantum Mechanics
5. A. Ghatak, Optics
6. O. Svelto, Principles of Lasers
7. R.K. Dubey & B.K. Singh, Engineering Physics.

Sambal

Hm

(R) Anasthi



ENGINEERING PHYSICS LAB

(TAS-152/252)

List of Experiments

1. To determine the wavelength of sodium light by Newton's ring.
2. To determine the wavelength of mercury light by a plane transmission grating.
3. To determine the specific rotation of sugar solution by polarimeter.
4. To determine the specific resistance of a wire by Carey-Foster's bridge.
5. To verify Stefan's law of radiation.
6. To study the temperature dependence of resistivity of a semiconductor (four probe method) and to determine the band gap of (Ge) material.
7. To determine the energy band gap of a given semiconductor materials using P-N junction diode.
8. To study the variation of magnetic field along the axis of a current carrying coil.
9. To calculate the current and voltage sensitivities of a moving coil galvanometer.
10. To calculate the co-efficient of thermal conductivity of non-metallic solids by Lee's disc method.
11. To determine the coefficient of viscosity of a liquid.
12. To calibrate the given ammeter and voltmeter by potentiometer.
13. To determine the focal length of combination of two thin lenses by Nodal slide assembly.

Text/Reference Books:

1. Engineering Physics Practical by S. K. Gupta, Krishna Prakashan Media.
2. A Text book of Engineering Physics Practical by C. S. Robinson and Dr. Ruby Das, Laxmi Publications Pvt. Ltd.
3. A Text book of Practical Physics by H.P. Shrivastava, ABD Publication.

Santosh

M

R. Anasui

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ELECTRONICS ENGINEERING EC201

Course Outcomes:

At the end of this course students will demonstrate the ability to:

- CO1. Describe the concept of PN Junction and devices.
- CO2. Explain the concept of BJT, FET and MOFET.
- CO3. Apply the concept of Operational amplifier to design linear and non-linear applications.
- CO4. Perform number systems conversions, binary arithmetic and minimize logic functions.
- CO5. Describe the fundamentals of communication technologies.

Program Outcome:

- PO1 Engineering knowledge: Apply the knowledge of science and fundamentals engineering.
- PO2 Problem analysis: Identify, formulate and analyze complex engineering problems reaching substantiated conclusions using natural sciences, and engineering sciences.
- PO3 Design/development of solutions: Design solutions for complex engineering problems and design system components or processes with appropriate consideration for cultural, societal, and environmental considerations.
- PO4 Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data and information to provide valid conclusions.
- PO5 Modern technique usage: Create and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities.

| UNIT | TOPIC |
|------|--|
| i | Semiconductor Diode: Depletion layer, Ideal and Practical Diode V-I characteristics; Diode Equivalent Circuits; Zener Diodes: Zener and Avalanche breakdown mechanisms. Diode Application: Half and Full Wave rectification; Clippers, Clampers; Zener diode as shunt regulator; Voltage-Multiplier Circuits. Special Purpose two terminal Devices: Light-Emitting Diodes; Photo Diodes. |
| ii | Bipolar Junction Transistor; Transistor Construction & Transfer Characteristics; Operation: Amplification, Switching Action; Transistor Configurations: Common Base, Common Emitter, Common Collector Configurations. Field Effect Transistor: Construction & Transfer Characteristics; Operation; MOSFET: Characteristics; Depletion Type; Enhancement Type. |

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02.09.2024

Manoj Kumar Shukla

(Laxmi Mishra)



| | |
|-----|--|
| iii | Operational Amplifiers (OPAMP): Basic Block Diagram; Differential and Common-Mode Operation; Practical Op-Amp Circuits: Inverting Amplifier, Non-inverting Amplifier, Unity Follower Circuit, Summing Amplifier, Integrator Circuit, Differentiator Circuit; Comparators. |
| iv | Digital Electronics: Number System & Representation; Binary Arithmetic, Digital Logic Gates, Simplification of Boolean function using Boolean Algebra. |
| v | Fundamentals of Communication Engineering: Basic Communication Signal Representation; Electromagnetic spectrum; Block Diagram of Digital Communication System; Analog Modulation Schemes: AM, FM, PM; Digital Modulation Schemes: ASK; FSK; PSK. Introduction to Wireless Communication: Overview of Wireless Communication; Various Generations of Cellular Communication; GSM ; CDMA. |

Text Books:

1. Robert L. Boylestand / Louis Nashelsky, "Electronic Devices and Circuit Theory", Pearson Education.
2. Upena Dalal, M. Shukla, "Wireless & Mobile Communication", Oxford University Press, 2016.
3. Jacob Millman, C.C. Halkias, Stayabrata Jit, "Electronic Devices and Circuits", McGraw Hill. Publications.
4. A. Anand Kumar, "Fundamental of Digital Circuits," PHI 4th edition, 2018.

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02.09.2024
(Manoj Kumar Shukla)

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(Laxmi Mishra)



ELECTRONICS ENGINEERING LAB
EC-151

LIST OF EXPERIMENTS

1. Study of electronics components and equipments.
2. To study V-I characteristics of Si diode.
3. To study V-I characteristics of Ge diode.
4. To study Zener diode characteristics.
5. Measurement of resistor using colour coding.
6. Determination of characteristics of BJT in common emitter configuration.
7. Determination of characteristics of BJT in common base configuration.
8. Study of BJT as single stage amplifier and determination of A_i , V_i , R_i and R_o .
9. Verification of logic OR, NOT, AND gates.
10. Verification of universal gates.

mls

ms

(Laxmi Mishra)



PROFESSIONAL COMMUNICATION
(HM 101/201)

COURSE OBJECTIVES: (CO'S)

| | |
|-------|--|
| CO 1: | Students will be enabled to understand the correct usage of grammar. |
| CO 2: | Students will be able to converse well with effective speaking and listening skills in English. |
| CO 3: | Students will be able to create substantial base by the formation of strong professional vocabulary for its application at different platforms and through numerous modes as Comprehension, reading and writing. |
| CO 4: | Student will be able to equip with basics of communication skills and will apply it for practical and oral purposes by being honed up in presentation skills and voice-dynamics. |
| CO 5: | Students will be able build up personal traits that will make the transition from institution to workplace smoother and help them to excel in their jobs. |

TOPICS

| | |
|-------------------|---|
| UNIT - I | Grammar and Usage: Parts of Speech with special reference to articles, verb, and preposition. Subject-verb agreement Prefix and Suffix, Advanced Vocabulary: Antonyms, Synonyms, Homophones, One word substitution, Formation of words; Noun from Verbs, Nouns from Adjectives, Adjectives from Noun, Adjectives from Verbs. Select foreign words and expressions used in English. |
| UNIT - II | Listening and Speaking Skills: Active Listening: Meaning and Art of Listening, Traits of a Good Listener, Listening modes, listening and Note taking, Types of Listening, Speaking style content and sequencing. |
| UNIT - III | Reading and Writing Skills: Reading style: Skimming; Scanning; Churning and Assimilation. Effective writing tools and methods: Inductive Deductive; Exposition; Linear, Interrupted; Spatial and Chronological etc. Official and Business Letter writing, Agenda, Notices, Minutes of meeting. |
| UNIT - IV | Presentation and Interaction Skills: Introduction to oral communication, Nuances and Modes of Speech Delivery, Public speaking: confidence, clarity, and fluency, Individual Speaking: Elements; Nonverbal Communication: Kinetics, Paralinguistic features of Voice- Dynamics, Proxemics, Chronemics, and Presentation Strategies: planning, preparation, organization, delivery. |
| UNIT - V | Work- Place communication: Leadership qualities; Impact, Communication skills for Leaders: Listening and Responding; Mental health at work place: Managing Stress; Techniques: Application of 4 A's: Avoid; Alter; Access; Adapt |

Prescribed Books:

1. R.P. Singh. *Functional Skills in Language and Literature*. New Delhi: OUP, 2024
2. Meenakshi Raman & S. Sharma, *Technical Communication* New Delhi: OUP 2015.
3. Barun K Mitra . *Personality Development & Soft Skills* New Delhi: OUP 2012.
4. Suresh Chandra . *Communication Skills and Ability*. Jaipur: Yking Books ,2022
5. Courtland L. Bovee, John, Thill and Mukesh Chaturvedi. *Business Communication Today*.
New Delhi: Pearson 2013.

R.P. Singh
21/9/24

Pratibha

Sharma



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COURSE OUTCOMES:

| | |
|----|---|
| 1: | Write professionally in simple and correct English. |
| 2: | Demonstrate active listening with comprehension, and the ability to write clear and well-structured emails and proposals. |
| 3: | Learn the use of correct body language and tone of voice to enhance communication. |
| 4: | Acquire the skills necessary to communicate effectively and deliver presentations with clarity and impact. |
| 5: | Understand and apply some important aspects of core skills, like Leadership and stress management. |

R. Singh
2/5/24

Pragathi
Chatterjee



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TAS151 /TAS251 SOFT SKILL LAB

LIST OF EXPERIMENTS:

| | |
|---------|--|
| EXP - 1 | Self-Skills: - Self, Importance to know Yourself, Clear Decision Making, Independence, Activity Building, Self Esteem, Work Place Management, Mental Health, Managing Mental Health, |
| EXP - 2 | Presentation Skills: - Knowledge of Presentation, Do's of Presentation- Define, Kiss Your Audience, Pace, Body Language, Eye Contact, Posture, Head Position, Arms & Legs, Don'ts of Presentation- Introduction and Body. |
| EXP - 3 | Communication Skills: - Definition, Process, What to Communicate, How to Communicate, Learn to Speak for Yourself, Power of Listening, Good and Poor Listening, Reasons of Poor Listening and how to Improve it. |
| EXP - 4 | Group Discussion: - Tips for Group Discussion, Topics for Group Discussion, Qualities to Develop for Effective Group Discussion. |
| EXP - 5 | Interview Skills: - Job Offer Process, Resume and Purpose of Resume, How to Write a Resume, Difference between Resume and CV, How to make and Impactful Resume, Order of Information in a Resume, Effective Appearance of a Resume, JAM (Just A Minute) Sessions, Mock Interviews , HR Round - Expectations, What creates Negative Impression during and Interview. |

R. Singh
21/5/24

P. Singh
A. Singh



ENVIRONMENTAL SCIENCE

SUBJECT CODE: HS - 101/201

L-T-P: 3-0-0

Credit: 3

Unit-I

Introduction: Definition, Scope and importance, Need for Public awareness, Ecosystem, Concept of ecosystem, Structure and function of an ecosystem Energy flow in ecosystem, Ecological succession, Balanced ecosystem, Human activities, Food shelter, Economic and Social security.

Effects of Human Activities on Environment: Agriculture, Housing industry, Mining and transportation activities, Basic of Environmental Impact Assessment, Sustainable development.

Unit-II

Natural Resources: Water Resources – Availability and quality aspects, Conservation of water, Water borne diseases, Water induced diseases, Fluoride problems in drinking water, Mineral resources, Forest wealth, Material cycles-carbon, Nitrogen and Sulphur cycles. Energy-Different types of energy, Electro-magnetic radiation, Conventional and Non-conventional sources, hydroelectric fossil fuel based, Nuclear, Solar, Biomass, Bio-gas, Hydrogen as an alternative future source of energy.

Unit-III

Environmental Pollution: Water pollution, Land pollution, Noise pollution, Public health aspects, Air pollution, Soil pollution, Marine pollution, Thermal pollution, Nuclear hazards, Solid Waste Management. Cause, effects and control measures of urban and industrial wastes, Role of an individual in prevention of pollution, Pollution case studies, Disaster management: Floods, earthquake, cyclone and landslides.

Unit-IV

Current environmental issue of importance, Population growth, Variation among nations, Population explosion, Family welfare programme, Climate change and Global warming-effects, Urbanization, Automobile pollution, Acid rain, Ozone layer depletion.

Unit-V

Environmental Protection-Role of government, Legal aspects, Initiatives by Non-Government Organizations (NGO), Environmental education, Value education, Human rights, HIV/AIDS, Women and child welfare, Case studies.

References/ Text Books:

1. Dhamija, S.K. (2006). —Environmental Studies, S.K. Kataria and Sons, New Delhi.
2. Anjanayulu, Y. (2002). —Environmental Studies, B.S. Publishers, Hyderabad.
3. Environmental Science by Kaushik & Kaushik.
4. Environmental Engineering Peary et al Pub. MacGrawhill
5. A Text Book of Environmental Engineering Venugopal Rao, Pub. PHI



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L. T. P.
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Paper Code- ME-102
Credit- 4

ENGINEERING MECHANICS

Course Outcomes:

In this course Student will learn how to -

1. Understand the effect of force system on static equilibrium of rigid bodies.
2. Locate the centroid and center of gravity and calculate the moment of inertia & mass moment of inertia for various shapes.
3. Workout the effect of loads on statically determinate structures i.e. Beams and Trusses.
4. Analyse and solve the problems based on equilibrium of force system in presence of frictional forces.
5. Analyse and solve the problems based on kinematics and kinetics.

UNIT - I

Friction:

Friction: Coulomb's law of friction, angle of friction, angle of repose, cone of friction, equilibrium of bodies involving dry friction, applications of friction force, problems involving friction of ladder, Rope and Belt wedges and connected bodies.

Introduction to Forces, Moments, Stresses and Strains:

Concept of force, types of force systems, principle of transmissibility, analysis of coplanar-concurrent force system (parallelogram law, resolution of forces, Lami's theorem) and coplanar non-concurrent force systems (moment of a force, moment for coplanar force system, couple, Varignon's theorem). Equilibrium of coplanar force system, free body diagrams, determination of reactions, equilibrium of co planar force system, problems, Stress and Strain, Axially loaded members and Hooke's law, Stress Strain Curve, Mechanical Properties of materials.

UNIT - II

Beam and Trusses:

Beam: Types of beams and Supports under various loads, Statically Determinate Beams, Shear force and bending moment in beams, Shear force and bending moment diagrams, Relationships between load, shear and bending moment.

Trusses: Introduction, Classification, Analysis of Plane Trusses- Method of Joints, Method Of joints, Method of Section, Zero Force Member.

UNIT - III

Properties of Surfaces and Solids: Centroids and center of mass, Centroids of lines and areas, Rectangular, circular, triangular areas by integration; T section, I section, Angle section, Hollow



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SECTION by using standard formula. Theorems of Pappus. Area moments of inertia of plane areas such as Rectangular, circular, triangular areas by integration. T-section, I-section, Angle section, Hollow section by using standard formula. Parallel axis theorem and perpendicular axis theorem, Principal moments of inertia of plane areas, Principal axes of inertia-Mass moment of inertia, mass moment of inertia for prismatic, cylindrical and spherical solids from first principle Relation to area moments of inertia.

UNIT - IV

Kinematics of Rigid Bodies:

Kinematics of rigid body: Introduction, plane motion of rigid body, velocity and acceleration under translational and rotational motion, relative velocity.

UNIT - V

Kinetics of Rigid Bodies:

Kinetics of rigid body: Introduction, force, mass and acceleration, work and energy, impulse and momentum, D'Alembert's principle and dynamic equilibrium.

Text Books:

1. S S Bhavikatti, Engineering Mechanics, New Age International Publishers, 2022
2. Dr. D.S Kumar, Engineering Mechanics (Statics & Dynamics), S K Kataria and Sons, 2013.
3. R.S. Khurmi, N. Khurmi, A Textbook of Engineering Mechanics in SI Unit, S.Chand Publishers, 2024
4. J.L Meriam, L.G Kraige, J.N Bolton, Engineering Mechanics: Dynamics, SI Version, Wiley, 2018
5. Irvin H. Shames, G. Krishna Mohana Rao, Engineering Mechanics-Statics and Dynamics, Pearson Education India, 2005
6. Dr. R.K Bansal, A Text Book Of Engineering Mechanics, Laxmi Publication, 2015
7. Beer, F.P and Johnston Jr. E.R., Vector Mechanics for Engineers (In SI Units): Statics and Dynamics, 8th Edition, Tata McGraw-Hill Publishing company, New Delhi (2004)

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L T P
0 0 2

Paper Code- ME-151
Credit- 1

ENGINEERING MECHANICS LAB

Course Outcomes:

1. Understand the effect of force system by parallelogram law, polygon law, Resultant Forces.
2. Understand the Mass Moment of Inertia by calculation and Practical by Apparatus
3. Understand the analysis of load on Trusses.
4. Understand Calculation of force system in presence of frictional forces.

List of Experiments:

1. Verification of law of parallelogram and triangle of forces.
2. Verification of law of Polygon of forces.
3. Verification of resultant and moment of forces by parallel force apparatus
4. Determination of mass moment of inertia of a fly-wheel
5. Determination of forces in fixed and moving arm of a truss.
6. Determination of Coefficient of friction of Sliding boxes of different materials on wooden inclined plane.
7. Determination of Coefficient of friction between rope and a fixed pulley.
8. Determination of Coefficient of friction of roller on wooden inclined plane
9. Determination of velocity ratio, mechanical advantage and efficiency of a screw jack
10. Determination of velocity ratio, mechanical advantage and efficiency of worm and worm wheel.

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(Recognized Under Section 2(B) & 12(B) of the U.G. Act, 1956 & B.Tech. Approved by CAICTE)

Paper Code- ME-101
Credit- 2

1. T P
2. 0 0

MANUFACTURING PROCESS

Course Outcomes:

1. Upon completion of this course, students will be able to understand the basics of manufacturing, its related process, and a few basics of machine tools.
2. Upon completion of this course, students will be able to understand the basics of casting process and their associated defects.
3. Upon completion of this course, students will be able to understand the basics of machine tools and their applications.
4. Upon completion of this course, students will be able to understand different types of machining process.
5. Upon completion of this course, students will be able to understand the basics of fabrication process and various other techniques to join metals.

UNIT-1

Concept of Manufacturing

Manufacturing definition; classification of manufacturing processes, role of manufacturing processes, Standardization, role of materials, processes and systems in manufacturing; classification and brief introduction of engineering materials such as metals & alloys ceramics and glasses, and Plastics; Classification and brief introduction of manufacturing processes, Guide to processing of metals & alloys.

UNIT-2

Casting Processes

Definition of casting process, Elements of sand mould, pattern, types of pattern, pattern allowances, Types of sand, properties of moulding sand, Classification of casting processes, application of casting process, Casting Defects

Metal working process

Basic introduction to metal working processes such as Rolling, Forging, Extrusion etc.

UNIT-3

Machine Tools

Lathe: Principle, construction, types, operations, Turret/capstan, semi/Automatic, Tool layout
Shaper, slotter, planer: Construction, operations & drives.
Milling: Construction, Milling cutters, up & down milling, Dividing head & indexing, Max chip thickness & power required.
Drilling and boring: Drilling, boring, reaming tools, Geometry of twist drills.

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ख़्वाजा मुईनुद्दीन चिश्ती भाषा विश्वविद्यालय, लखनऊ, उत्तर प्रदेश (भारत)
Khwaja Moinuddin Chishti Language University, Lucknow, U.P. (India)

U.P. STATE GOVERNMENT UNIVERSITY.
(Recognized Under Section 2(f) & 12(B) of the U.G.C. Act, 1956 & B. Tech. Approved by (AICTE))

Machining Processes

UNIT-4

Classification of machining processes; Processes associated with Lathe Machine and Drilling Machine; Study about Facing, Turning, Parting, grooving, Threading and Knurling, and Drilling related operations.

Fabrication Processes

UNIT-5

Classification of Welding Operations, Types of Joints & Welding Positions, Brief description of Arc, Resistance, and Gas welding techniques, Brazing and Soldering, Brief introduction of Newer Machining Processes

Books and References:

1. Manufacturing Science - A. Ghosh and A.K. Mallik, Affiliated East-West Press
2. Fundamentals of Metal Machining and Machine Tools - Geoffrey Boothroyd, CRC
3. Press Production Technology - R.K. Jain Khanna Publishers.

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Paper Code- ME-151/251
Credit- 1

WORKSHOP PRACTICES

Course Outcomes:

Upon the completion of this course the students will be able to

1. Fabricate carpentry components and pipe connections including plumbing works.
2. Use welding equipment to join the structures.
3. Carry out the basic machining operations
4. Use sheet metal fabrication tools and make simple models as per the given diagram.

List of Workshop Activity

1. Manufacturing Methods- casting, forming, machining, joining, advanced manufacturing methods.
2. CNC machining, Additive manufacturing
3. Fitting shop operations & power tools
4. Black smithy shop.
5. Carpentry shop
6. Plastic moulding, glass cutting
7. Metal casting
8. Welding shop (arc welding & gas welding)
9. Sheet metal shop

Suggested Text /Reference Books:

1. Hajra Choudhury S.K., Hajra Choudhury A.K. and Nirjhar Roy S.K., "Elements of Workshop Technology", Vol. I 2008 and Vol. II 2010, Media promoters and publishers private limited, Mumbai.
2. Kalpakjian S. And Steven S. Schmid, "Manufacturing Engineering and Technology", 4th edition, Pearson Education India Edition, 2002.
3. Gowri P. Hariharan and A. Suresh Babu, Manufacturing Technology I Pearson Education, 2008.
4. Roy A. Lindberg, "Processes and Materials of Manufacture", 4th edition, Prentice Hall India, 1998.
5. Rao P.N., "Manufacturing Technology", Vol. I and Vol. II, Tata McGrawHill House, 2017.



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L T P
0 0 2

Paper Code- ME-152/252
Credit- 1

ENGINEERING GRAPHICS LAB

Course Outcomes:

At the end of course the student will be able to:

1. Get acquainted with the knowledge of various lines, geometrical constructions and construction of various kinds of scales, and Ellipse.
2. Improve their imagination skills by gaining knowledge about points, lines and planes.
3. Become proficient in drawing the projections of various solids.
4. Gain knowledge about orthographic and isometric projections.

List of Engineering Graphics Activity

1. Introduction to engineering graphics, basics of sheet sizes and choice of scale, title block, types of lines & geometric constructions, proper layout (spacing) of problems on the drawing sheet. Lettering, dimensioning details.
2. Orthographic projection of points, projection of lines, Orthographic views.
3. Sectioning of solids.
4. Details of fasteners (e.g. bolt, nut, stud, screw etc.), terminology of threads, types (e.g. v. square, acme, single/multi start, left/right handed etc.).
5. Elementary idea of joints (e.g. Riveted, welded, soldered, adhesive etc.), other joints (like cotter, knuckle etc.) along with their relative advantages and disadvantages and application areas, various couplings and their applications.
6. Introduction to Modeling Software.

Text/Reference Books:

1. Machine drawing, by K.L.Narayana, P. Kannaiah & K.Venkata Reddy New Age International publishers.
2. Machine Drawing includes AutoCAD, by Ajeet Singh, Tata McGraw Hill Publishing Company Ltd.
3. Elementary Engineering Drawing, by Bhatt N.D. Charotar Publishing.
4. Machine Drawing by Bhatt N D Charotar Publishing.
5. Engineering Drawing, by M. B. Shah & B. C. Rana Pearson Education India.
6. Engineering Drawing, by Jolhe D.A. Tata McGraw Hill Education.



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Subject – Introduction to Biotechnology - I

| Course Outcome (CO): - | |
|------------------------|--|
| CO 1: | Understand and apply biotechnology concepts and their real-world applications across various industries. |
| CO 2: | Explain cellular structures and functions of prokaryotic and eukaryotic cells, including plant and animal cells. |
| CO 3: | Analyze biochemical molecules, their structures, functions, and the role of enzymes in metabolic processes. |
| CO 4: | Describe molecular biology principles, including DNA/RNA structures, gene functions, and genetic engineering techniques. |

Course Content:

Unit I

Overview of Biotechnology: Definition, Scope and Applications of Biotechnology.

Unit II

Fundamentals of Biology: Hierarchy of living organisms, Concept of cell; Cellular architecture of prokaryotic & eukaryotic cells, plant cells and animal cells, structure and function of plasma membrane, cell organelles and their function.

Unit III

Basics of Biochemistry: Basic chemical constituents of living body, biomolecules, types, structure and function of macromolecules, general characteristics and classification of enzymes.

Unit IV

Fundamentals of Molecular Biology: Nucleic Acids as genetic material, genes, types of DNA and RNA, their structure and function, Central Dogma of Molecular Biology, Concepts of genetic engineering.

Unit V

Basic Techniques: Principles, Methods and Types of Electrophoresis and Centrifugation, Roles of Staining, Chromatography, Autoradiography, microscopy in cellular studies.

Text Books / References:

1. Concepts of Biotechnology by D. Balasubramanian, C.F.A. Bryce, K. Jayaraman et al., Universities Press (2004)
2. Biotechnology: Expanding Horizons by B. D. Singh, Kalyani Publisher (2015).



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Practical

1. Introduction to Glassware / Equipment & pipetting Method.
2. Preparation of Buffer Solutions.
3. Standardization of pH meter.
4. General Tests of carbohydrates, Proteins / Lipids.
5. Enzymatic Activity on Starch.
6. Estimation of ketone bodies, bile salts / bile pigments.
7. Quantitative Estimation of Biomolecules (Carbohydrates / Proteins / DNA).

Dingl

Rishi

Motpur

Kiranishi



PROGRAMMING FOR PROBLEM SOLVING
(TCS101/201)

| COURSE OUTCOMES (COs): | |
|------------------------|--|
| CO 1: | To develop simple algorithms for arithmetic and logical problems. |
| CO 2: | To translate the algorithms to programs & execution (in C language). |
| CO 3: | To implement conditional branching, iteration and recursion. |
| CO 4: | To decompose a problem into functions and synthesize a complete program using divide and conquer approach. |
| CO 5: | To use arrays, pointers and structures to develop algorithms and programs. |
| Unit | Topic |
| I | Computer System: Introduction, Memory, processor, I/O Devices, storage, operating system, Concept of assembler, compiler, interpreter, loader and linker. Algorithm: Definition, Representation of Algorithm, Flowchart, Pseudo code with examples, From algorithms to programs. Programming Basics: Structure of C program, writing and executing the first C program, Syntax and logical errors in compilation, object and executable code. Components of C language. Standard I/O in C, Fundamental data types, Variables and memory locations, Storage classes. |
| II | Arithmetic expressions and precedence: Operators and expression using numeric and relational operators, mixed operands, type conversion, logical operators, bit operations, assignment operator, operator precedence and associativity. Conditional Branching: Applying if and switch statements, nesting if and else, use of break and default with switch. |
| III | Iteration and loops: use of while, do while and for loops, multiple loop variables, use of break and continue statements. Functions: Introduction, types of functions, functions with array, passing parameters to functions, call by value, call by reference, recursive functions. |
| IV | Arrays: Array notation and representation, manipulating array elements, using multi-dimensional arrays. Character Arrays and Strings, Searching, Sorting algorithms (Bubble, Insert and Selection), Structure, union, enumerated data types, Array of structures, Passing arrays to functions. |
| V | Pointers: Introduction, declaration, applications, Introduction to dynamic memory allocation (malloc, calloc, realloc, free), Use of pointers in self-referential structures, File handling: File I/O functions, Standard C preprocessors, defining and calling macros, command-line arguments. |

Text Book (s):

1. Schaum's Outline of Programming with C by Byron Gottfried, McGraw-Hill.
2. The C programming by Kernighan Brain W. and Ritchie Dennis M., Pearson Education.
3. Let Us C By Yashwant P. Kanetkar. BPB Publications, 2016.
4. Computer Basics and C Programming by V. Rajaraman, PHI Learning Pvt. Limited, 2015.
5. Computer Concepts and Programming in C, E Balaguruswami, McGraw Hill.



**PROGRAMMING FOR PROBLEM SOLVING LAB
(TCS151/251)**

LIST OF THE EXPERIMENTS:

- Practice of C Language as the development environment.
- Simple introductory algorithms and programs for getting input, printing formatted output etc.
- Programs introducing elementary C concepts, like variable and names.
- Programs using operators.
- Programs using control structures.
- Programs for repetitive tasks and iterations.
- Programs on arrays and strings.
- Programs introducing the use of function calls.
- Programs of Searching, Sorting (Bubble, Selection and Insertion).
- Programs introducing basic concept of file handling and storage classes.

Note: The instructor may add/ modify the list as per his/her wisdom for better hands on the students.

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