

## 2.1 ENGLISH AND COMMUNICATION SKILLS – II

L T P  
3 - 2

### RATIONALE

Language is the most commonly used medium of self-expression in all spheres of human life – personal, social and professional. A student must have a fair knowledge of English language and skills to communicate effectively to handle the future jobs in industry. The objective of this course is to enable the diploma holders to acquire proficiency, both in spoken (oral) and written language. At the end of the course, the student will be able to develop comprehension skills, improve vocabulary, use proper grammar, acquire writing skills, correspond with others and enhance skills in spoken English. It is expected that each polytechnic will establish a **communication skill laboratory** for conducting practicals mentioned in the curriculum.

### DETAILED CONTENTS

1. Facets of Literature (14 hrs)
  - 1.1 Short stories
    - 1.1.1 The Portrait of a Lady - Khushwant Singh
    - 1.1.2 The Doll's House – Katherine Mansfield
    - 1.1.3 The Refugees – Pearl S. Buck
  - 1.2 Prose
    - 1.2.1 Walking Tours – R.L. Stevenson
    - 1.2.2 A Dialogue on Civilization – C.E.M. Joad
    - 1.2.3 The Sign of Red Cross – Horace Shipp
  - 1.3 Poems
    - 1.3.1 All The World's A Stage – W. Shakespeare
    - 1.3.2 Say Not, The Struggle Nought Availeth – A.H. Clough
    - 1.3.3 Pipa's Song – Robert Browning
2. The Art of Précis Writing (04 hrs)
3. Grammar and Usage (08 hrs)
  - 3.1 Narration
  - 3.2 Voice
  - 3.3 Idioms and Phrases
4. Correspondence (04 hrs)
  - 4.1 Business Letters

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|-----|--|----------|
| 4.2 | Personal letters   |          |
| 5.  | Drafting   | (06 hrs) |
| 5.1 | Report Writing   |          |
| 5.2 | Inspection Notes   |          |
| 5.3 | Memos, Circulars and Notes                                     |          |
| 5.4 | Notices  |          |
| 5.5 | Press Release  |          |
| 5.6 | Agenda and Minutes of Meetings                                 |          |
| 5.7 | Applying for a Job: Forwarding letter, Resume/C.V., follow up. |          |
| 6.  | Glossary of Technical & Scientific Terms                       | (04 hrs) |
| 7.  | Communication  | (08 hrs) |
| 7.1 | Media and Modes of Communication                               |          |
| 7.2 | Channels of Communication                                      |          |
| 7.3 | Barriers to Communication                                      |          |
| 7.4 | Listening Skills   |          |
| 7.5 | Body language  |          |
| 7.6 | Humour in Communication  |          |

### LIST OF PRACTICALS

1. Practice on browsing information from Internet and e-mail
2. Group Discussions
3. Mock Interviews
4. Telephone Etiquette – demonstration and practice
5. Situational Conversation with feedback through video recording
6. Presentation on a given theme (using PowerPoint)
7. Exercises leading to personality development like mannerism, etiquettes, body language etc.
8. Reading unseen passages
9. Writing (developing) a paragraph
10. Exercises on writing notices and telephonic messages

#### Note:

1. The Text Book on “English and Communication Skills, Book-II By Kuldip Jaidka et. al. developed by NITTTR, Chandigarh is recommended to be used for teaching & setting-up the question papers.
2. A communication laboratory may be set up consisting of appropriate audio-video system with facility of playing CDs/DVDS and a video camera for recording the performance of each student with play back facility. A set of CDs from any language training organization e.g. British Council etc. may be procured for use of students.
3. Elements of body language will be incorporated in all practicals
4. The practical exercises involving writing may also be included in Theory Examination.

## RECOMMENDED BOOKS

1. English and Communication Skills, Book-I By Kuldip Jaidka, Alwainder Dhillon and Parmod Kumar Singla, Prescribed by NITTTR, Chandigarh Published By Abhishek Publication, 57-59, Sector-17, Chandigarh
2. Rich Vocabulary Made Easy by Kuldip Jaidka , Mohindra Capital Publishers, Chandigarh
3. Spoken English (2<sup>nd</sup> Edition) by V Sasikumar & PV Dhamija; Published by Tata MC Graw Hills, New Delhi.
4. Spoken English by MC Sreevalsan; Published by M/S Vikas Publishing House Pvt. Ltd; New Delhi.
5. Spoken English –A foundation course (Part-I & Part-II) By Kamlesh Sdanand & Susheela Punitha; Published by Orient BlackSwan, Hyderabad
6. Practical Course in English Pronunciation by J Sethi, Kamlesh Sadanand & DV Jindal; Published by PHI Learning Pvt. Ltd; New Delhi.
7. A Practical Course in Spoken English by JK Gangal; Published by PHI Learning Pvt. Ltd; New Delhi.
8. English Grammar, Composition and Usage by NK Aggarwal and FT Wood; Published by Macmillan Publishers India Ltd; New Delhi.
9. Business Correspondence & Report writing (4<sup>th</sup> Edition) by RC Sharma and Krishna Mohan; Published by Tata MC Graw Hills, New Delhi.
10. Business Communication by Urmila Rani & SM Rai; Published by Himalaya Publishing House, Mumbai.
11. Business Communication Skills by Varinder Kumar, Bodh Raj & NP Manocha; Published by Kalyani Publisher, New Delhi.
12. Professional Communication by Kavita Tyagi & Padma Misra; Published by PHI Learning Pvt. Ltd; New Delhi.
13. Business Communication and Personality Development by Bsiwajit Das and Ipseeta Satpathy; Published by Excel Books, Delhi
14. Succeeding Through Communication by Subhash Jagota; Published by Excel Books, Delhi
15. Communication Skills for professionals by Nira Konar; Published by PHI Learning Pvt. Ltd; New Delhi.
16. Developing Communication Skills (2<sup>nd</sup> Edition) by Krishna Mohan & Meera Banerji; Published by Macmillan Publishers India Ltd; New Delhi.
17. Effective Technical Communication By M .Ashraf Rizwi; Published by Tata MC Graw Hills, New Delhi.
18. Basic Communication Skills for Technology by Andrea J Rutherford; Published by Pearson Education, New Delhi
19. English & Communication Skills for students of Science & Engineering by SP Dhanavel; Published by Orient BlackSwan, Hyderabad.
20. Technical Communication- Principles & Practices by Meenakshi Raman & Sangeetha Sharma; Published by Oxford University Press, New Delhi.

21. Technical English by S. Devaki Reddy & Shreesh Chaudhary; Published by Macmillan Publishers India Ltd; New Delhi.
22. Advanced Technical Communication, by Kavita Tyagi & Padma Misra; Published by PHI Learning Pvt. Ltd; New Delhi.
23. Communication Skills for Engineer & Scientist by Sangeeta Sharma & Binod Mishra; Published by PHI Learning Pvt. Ltd; New Delhi.

**SUGGESTED DISTRIBUTION OF MARKS**

<b>Topic No.</b>	<b>Time Allotted (Hrs)</b>	<b>Marks Allotted (%)</b>
1	14	30
2	4	10
3	8	10
4	4	10
5	6	10
6	4	10
7	8	20
<b>Total</b>	<b>48</b>	<b>100</b>

## GLOSSARY OF TECHNICAL AND SCIENTIFIC TERMS

1. Absolute	परम, अचर, पूर्ण, स्थिर	مکمل - ساکن
2. Acceleration	त्वरण, प्रवेग	حرکت
3. Acid	अम्ल	عمل - تیزاب
4. Alkaline	क्षारीय, खारा	کھارا
5. Air Compressor	वायु-संपीडक	ہوا کے دباؤ - ایرکمپریشر
6. Air Conditioning	वातानुकूलन	ایئر کنڈیشن -
7. Alignment	सरेखन	ایک لائن میں - ایک سیدھی
8. Alternating Current	प्रत्यावर्ती धारा	تعمیر کرنٹ - لے سی کرنٹ
9. Altimeter	ऊंचाई मापने का यंत्र	اوجائی ماپنے کا آلہ
10. Alum	फिटकरी	پھٹکڑی
11. Ammeter	अम्मीटर	بجلی کا کرنٹ ماپنے کا آلہ - ایلمی میٹر
12. Ampere	ऐम्पयर	بجلی کی طاقت کو ماپنے کی اکائی - ایمپیر
13. Amplication	प्रवर्धन	پرو دھن - ایمپلی کیشن
14. Amplitude	आयाम	ایام - ایمپلیٹیوڈ
15. Angle	कोण	زاویہ - کون
16. Angular velocity	कोणीय वेग	کوئی ویگ
17. Angular Momentum	कोणीय संवेग	کوئی سٹوگ
18. Annealing	तापानुशीतन	تاپ اوشٹن - انی ٹنگ
19. Anode	अनोड	انوڈ
20. Apex	शीर्ष, शिखर, शिखाग्र	اوجائی - سب سے اوجیا
21. Apparent	स्पष्ट	صاف
22. Applied mechanics	अनुप्रयुक्त यंत्रिकी	اپلایڈ میکینک
23. Applied Science	अनुप्रयुक्त विज्ञान	اپلایڈ سائنس
24. Archimedes's Principle	आर्किमिडीज़ का सिद्धांत	آرک میڈیز کا اصول
25. Architecture	वास्तुकला, स्थापत्यकला	تعمیراتی سائنس - تعمیراتی کلا
26. Armature	आर्मेचर	دایہچر
27. Atom	परमाणु	ایٹم
28. Automatic	स्वचलित	اپنے آپ چلنے والا
29. Axis	अक्ष	اکس
30. Axle	धुरी	دھرا - ایکسل

31. Balance (Scale)	تولا، तराजू	تراڑھ
32. Ball Bearing	بال-بے یئرنگ	یاں یئرنگ
33. Bar magnet	छड़-चुम्बक	مقناقیس کا ٹکڑا
34. Barometer	वायुदाबमापी	ہوا کا دباؤ ماپنے کا آلہ۔ بیردمیٹر
35. Base	आधार	بنیادی
36. Base Plate	आधार पट्टिका	بنیادی پلیٹ۔ آڈیا رپڑکا۔ بیس پلیٹ
37. Battery	बैटरी	بیٹری
38. Beaker	बीकर	بی کپ
39. Bending Moment	वंकन आधूर्ण	بنڈنگ مومینٹ جھکنے کی شکتی (طاقت) پچک
40. Blast Furnace	झोंका भट्टी	بلاسٹ فرنس۔ بلاسٹ بھیٹی۔
41. Bleach	विरंजक	بلیچ۔ ڈرنجک
42. Boiler	उबालक	بوایلر۔ اُبالنے والا۔ اباک۔
43. Bridge	पुल	پل
44. Burette	ब्यूरेट	بیوریٹ۔ لیبارٹری میں استعمال ہونے والی شیشے کی نمالی۔
45. Callipers	कैलिपर्स	کیلیپرس۔
46. Calorie	कैलोरी	کیلو ریٹ۔ نوراگ کی طاقت ماپنے کی یونٹ
47. Canal	नहर	نہر۔
48. Capacitance	धारिता	کے پے سی ٹنس۔ دہارتا
49. Carburettor	कार्बुरेटर	کاربوریٹر
50. Cast Iron	ढलवा लोहा	کچی لوہا۔ کاسٹ آئرن
51. Catalyst	उत्प्रेरक	آٹ پریٹرک۔
52. Cathode	कैथोड	کے کٹھوڈ
53. Centre of Gravity	गुरुत्वाकर्षण-केन्द्र	دھرتی کی طاقت کا مرکز۔
54. Centrifugal	उपकेन्द्रीय	مرکزت دور کرنے والا۔ آپ کینڈریہ
55. Centripetal	अभिकेन्द्रीय	مرکز کی طرف لانے والا۔ ابھی کینڈریہ
56. Centroid	केन्द्रीय	مرکزنی
57. C.G.S. System	सी.जी.एस. पद्धति	سی جی ایس۔ ایس۔ سسٹم
58. Chemical Action	रासायनिक क्रिया	تیزابی نتیجہ۔
59. Chain	श्रृंखला, माला	سلسلہ۔ مالا۔
60. Change of State	अवस्था परिवर्तन	تبدیلی حالات
61. Characteristics	लक्षण	آثار۔ خصوصیات
62. Charge (n)	आवेश	آولیش۔ چارج۔ بھرتا
63. Choke	चोक	چوک۔ بیسی کی پوسٹ کو چلانے کیلئے دکایا جانے والا پڑھ
64. Chord, Major	गुरू स्वर-संघात	کارڈ میجر۔ لورڈ سورنگھات۔
65. Chord, Minor	लघु स्वर-संघात	کارڈ مینور۔ چھوٹا سورنگھات
66. Circular	वृत्ताकार, वर्तुल	سرکولر۔ ورتا کار۔ ورتل۔ باہر سے جائے والا

67. Clock-wise	دائیں ہاتھ چلنے والا۔ دیکشن ورت کلاک دائیں
68. Coagulation	کوآگولیشن۔ سکند
69. Coefficient of Expansion	کو ایفیشنٹ آف ایکشن۔ پراسارنگ۔ نمبرت پیلے ترتیب کے لگایا نمبر گونا گوں
70. Coil	کوئیل۔ کتہلی۔
71. Combustion	دہن۔
72. Compass	کمپاس۔ اطراف بتانے والا آلہ۔ دشا سچک۔
73. Compound	کمپاؤنڈ۔ یوگک۔
74. Concave	کنکون۔ اوٹل۔
75. Convex	کنکون۔ اٹل۔
76. Concentrated (Solution)	گھاڑھا مشرب گھول۔ سولیوشن
77. Concrete	کنکریٹ۔ پتھر کا۔
78. Conduction	کنڈکشن۔ چالن۔
79. Conductor	کنڈکٹر۔ چلانے والا۔
80. Cone	کون۔ شنگو۔
81. Connection	جوڑ۔ تعلق۔
82. Constant (Adj.)	کنسٹنٹ۔ ساکن۔ اچل۔
83. Convection	کنوئکشن۔ سزا ہونا۔ زور نہ ہونا۔ وزن نہ ہونا بات میں
84. Coulomb	کولومب (विद्युत शक्ति की इकाई)۔ طاقت کی اکائی۔
85. Couple	کیپل۔ بل یوگم۔ طاقت یوگم
86. Crane	کرین۔ وزن اٹھانے والی مشین
87. Crystalline	کرسٹلائن۔ رو سے دار۔ کرسٹلائن۔
88. Dehydrate	ڈیہائیڈریٹ۔ بنیر پانی سے ہونا۔
89. Distil	ڈسٹیل۔ عرق نکالنا
90. Effervescence	ایفیرسینس۔ پید اہٹ
91. Element	ایلیمنٹ۔ بلب میں جلنے والی تار۔ توتو
92. Empirical Formula	ایمپیریکیل فورمولا۔ بنیادی نوپائی سوئٹر۔
93. Equivalent Weight	ایکویولینٹ ویٹ۔ برابر وزن کا۔
94. Flame Test	فلیم ٹیسٹ۔ آگ کے شعلہ کا ٹیسٹ۔
95. Flash Point	فلش پوائنٹ۔ آگ کی گرمی
96. Flask	فلاسک۔ پانی کو گرم یا ٹھنڈا رکھنے والی بوتل۔
97. Spring Balance	سپرنگ بالانس۔ اتر ترازو۔
98. Soluble	سولیبل۔ وٹے شیں۔ سولیبل
99. Viscosity	ویسکوسٹی۔ گھاڑھا پن
100. Volumetric Analysis	ولیمیک موزن۔ ویو میٹرک موزن / مقابلہ

## 2.2. APPLIED MATHEMATICS - II

L T P  
5 - -

### RATIONALE

Applied mathematics forms the backbone of engineering students. Basic elements of Differential calculus and integral calculus and statistics have been included in this course. This will develop analytical abilities to apply in engineering field and will provide continuing educational base to the students.

### DETAILED CONTENTS

#### 1. Differential Calculus (30 hrs)

##### 1.1 Definition of function; Concept of limits.

$$\text{Four standard limits } \lim_{x \rightarrow a} \frac{x^n - a^n}{x - a}$$
$$\lim_{x \rightarrow 0} \frac{\sin x}{x}, \quad \lim_{x \rightarrow 0} \frac{a^x - 1}{x}, \quad \lim_{x \rightarrow 0} (1+x)^{1/x}$$

##### 1.2 Differentiation by definition of $x^n$ , $\sin x$ , $\cos x$ , $\tan x$ , $e^x$ , $\log_a x$ only

##### 1.3 Differentiation of sum, product and quotient of functions. Differentiation of function of a function.

##### 1.4 Differentiation of trigonometric inverse functions . Logarithmic differentiation. Exponential differentiation Successive differentiation (excluding nth order).

##### 1.5 Applications:

(a) Maxima and minima

(b) Equation of tangent and normal to a curve (for explicit functions only) – Simple problems only

#### 2. Integral Calculus (30 hrs)

##### 2.1 Integration as inverse operation of differentiation

##### 2.2 Simple integration by substitution, by parts and by partial fractions (for linear factors only)

##### 2.3 Evaluation of definite integrals (simple problems)-

$$\text{Evaluation of } \int_0^{\pi/2} \sin^n x \, dx, \quad \int_0^{\pi/2} \cos^n x \, dx, \quad \int_0^{\pi/2} \sin^m x \cos^n x \, dx$$

using formulae without proof (m and n being positive integers only)

#### 3 Ordinary Differential Equations (10 hrs)

##### 3.1. Definition and formation of Differential Equations

##### 3.2. Solution of first order Differential Equations of the type:

(i) Variable separable form



- (ii) Homogeneous Differential Equations
- (iii) Linear Differential Equations

4. Statistics (10 hrs)

- 4.1 Measures of Central Tendency: Mean, Median, Mode
- 4.2 Measures of Dispersion: Mean deviation, Standard deviation

### RECOMMENDED BOOKS

1. Elementary Engineering Mathematics by BS Grewal, Khanna Publishers, New Delhi.
2. Applied Mathematics –II by Dr. Sunita Rani Jain, Abhishek Publishers, Chandigarh
3. Engineering Mathematics by Vol. I & II by S Kohli, IPH, Jalandhar
4. Applied Mathematics by Dr. RD Sharma
5. Applied Mathematics, Vol. I & II by SS Sabharwal & Sunita Jain, Eagle Parkashan, Jalandhar
6. Comprehensive Mathematics, Vol. I & II by Laxmi Publications
7. Engineering Mathematics by Dass Gupta
8. Engineering Mathematics by C Dass Chawla, Asian Publishers, New Delhi
9. Comprehensive Mathematics, Vol. I & II by Laxmi Publications
10. Engineering Mathematics, Vol I, II & III by V Sundaram et.al, Vikas Publishing House (P) Ltd., New Delhi
10. Engineering Mathematics by N.Ch.S.N Iyengar et.al, Vikas Publishing House (P) Ltd., New Delhi
11. Engineering Mathematics, Vol I & II by SS Sastry, Prentice Hall of India Pvt. Ltd.,
12. Engineering Mathematics, Vol I & II by AK Gupta, Macmillan India Ltd., New Delhi

### SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	30	35
2	30	40
3	10	10
4	10	15
<b>Total</b>	<b>80</b>	<b>100</b>

## 2.3 TEXTILE RAW MATERIALS

L T P  
4 - 2

### RATIONALE

The students of Textile Technology after completion of their diploma have to work in Textile Mills/Houses/Quality Control Centres and have to supervise various units in the manufacture of textiles for which knowledge of textile raw materials is essential. Hence this subject is required for primary and elementary knowledge of the textile fibers.

### DETAILED CONTENTS

1. Definition and classification of textile fibers (6 hrs)
2. Production of cotton, jute and silk, grading of cotton, silk and wool (10 hrs)
3. Physical and chemical identification of textile fibers (cotton, silk, wool, jute, acrylic, nylon, polyester, flax, viscose, polypropylene) (12 hrs)
4. Manufacturing process of different fibers i.e., Viscose rayon, High wet modules Rayon (Polynosic), Acetate, Nylon 6, Nylon 66, Polyester and Acrylic (12 hrs)
5. Basic Knowledge of process flow of cotton (combed and carded), woolen and worsted spinning systems. (6 hrs)
6. Properties of textile fibers-cotton, wool, silk, jute, viscose rayon, polynosic rayon, acetate, nylon 6, nylon 66, polyester and acrylic and their effect on yarn properties (18 hrs)

### LIST OF PRACTICALS

1. Physical identification of Natural fibres (cotton, wool , silk, jute)
2. Physical identification of Manmade fibres. (viscose rayon, polyester, nylon and acrylic)
3. Chemical identification of Natural fibres (cotton, wool, silk, jute)
4. Chemical identification of Manmade fibres. (viscose rayon, polyester, nylon, acrylic).

## **INSTRUCTIONAL STRATEGY**

Teachers should lay emphasis on clarifying the concepts and principles. Teachers should use various teaching aids to clarify the concepts and principles. The students may be exposed to different types of textile manufacturing processes through visit to textile mill so that they are able to understand the subject properly.

## **RECOMMEND BOOKS**

1. Textile Science by Gohl and Vilensky or EPS Gohl
2. Textile Fibres by Atira
3. Fibre Science by JM Preston
4. Fibre Science by Gopalakrishnan et. al
5. Stains Removing Techniques-by S.S.Satsangi, Usha publishers 53B/AC-IV Shalimar Bagh, Delhi-110088
6. Textile Fibres by V.A. Shenai

## **SUGGESTED DISTRIBUTION OF MARKS**

Topic No.	Time Alloted (Hrs)	Marks Alloted (%)
1.	06	09
2.	10	16
3.	12	18
4.	12	18
5.	06	09
6.	18	30
Total	64	100

## 2.4 APPLIED CHEMISTRY-II

L T P  
3 - 2

### RATIONALE

The role of chemistry in every branch of engineering and technology is expanding greatly. Now a days, various chemical products are playing important role in the field of engineering with increasing number of such products each successive years. The strength of materials, the chemical composition of substances, their behaviour when subjected to different treatment and environment, and the laws of heat and dynamic energy have entered in almost every activity of modern life. Chemistry is considered as one of the core subjects for diploma students in engineering and technology for developing in them scientific temper and appreciation of chemical properties of materials, which they have to handle in their professional career. Effort should be made to teach this subject through demonstrations/ minor projects and with the active involvement of students.

Note:- Teachers should give examples of engineering/technology applications of various concepts and principles in each topic so that students are able to appreciate learning of these concepts and principles.

### DETAILED CONTENTS

#### 1. Metallurgy (08 hrs)

A brief introduction of the terms: Metallurgy (types), mineral, ore, gangue or matrix, flux, slag, concentration (methods of concentrating the ores), ore, roasting, calcinations, smelting and refining of metal.

Metallurgy of (i) Aluminium (ii) Iron

Definition of an alloy, purposes of alloying, composition, properties and uses of alloys- brass, bronze, monel metal, magnalium, duralumin, alnico, stainless steel and invar.

#### 2. Fuels (10 hrs)

2.1 Definition of a 'Fuel', characteristics of a good fuel and classification of fuels with suitable examples

2.2 Definition of Calorific value of a fuel and determination of calorific value of a solid fuel with the help of Bomb calorimeter. Simple numerical problems based upon Bomb-calorimeter method of finding the Calorific values

- 2.3 Brief description of 'Proximate' and 'Ultimate' analysis of a coal. Importance of conducting the proximate and ultimate analysis of a fuel
- 2.4 Merits of gaseous fuels over those of other varieties of fuels
- 2.5 Manufacture, composition, properties and uses of (i) Water gas (ii) Oil gas (iii) Biogas
- 2.6 Composition, calorific values and applications of (i) LPG (ii) CNG (iii) Power alcohol
- 2.7 Fuel rating
  - 2.7.1 Octane number for petrol
  - 2.7.2 Cetane number for diesel

3 Corrosion (06 hrs)

- 3.1 Definition of corrosion
- 3.2 Theories of corrosion i.e. (i) direct chemical action theory and (ii) electro chemical theory
- 3.3 Passivity
- 3.4 Prevention of corrosion by
  - 1. (a) Alloying
  - (b) Providing metallic coatings
  - 2. Cathodic protections:
    - (a) Sacrificial
    - (b) Impressed voltage method
  - 3. Heat treatment (quenching, annealing, tempering & normalizing)

4 Lubricants (06 hrs)

- 4.1 Definition of (i) lubricant (ii) lubrication
- 4.2 Classification of lubricants
- 4.3 Principles of lubrication
  - (i) fluid film lubrication
  - (ii) boundary lubrication
  - (iii) extreme pressure lubrication

- 4.4 Properties of lubricants
- 4.4.1 Physical properties: viscosity, viscosity index, flash-point, fire-point, cloud-pour point, oiliness, volatility, emulsification
  - 4.4.2 Chemical properties-Total acidity number (TAN) saponification and iodine value, coke number and aniline point.

5 Glass (04 hrs)

5.1 Glass: Chemical composition, types of glasses and their applications

5.2 Manufacture of ordinary glass and lead glass

6. Classification and Nomenclature of Organic Compounds (06 hrs)

Classification of Organic Compounds, functional group, Homologous Series, IUPAC-Nomenclature of various homologous series i.e. alcohols, aldehydes, ketones, carboxylic acids, and phenols.

7. Polymers & Plastics (08 hrs)

7.1 Definition of polymer, monomer & degree of polymerization

7.2 Brief introduction of addition & condensation polymers with suitable examples (PVC, Polyester, Teflon, Nylon 66, Bakelite)

7.3 Definition of plastic & type of plastics (thermo & thermo setting plastics) with suitable examples

7.4 Applications of polymers & plastics in daily life.

**LIST OF PRACTICALS**

1. Gravimetric analysis and study of apparatus used
2. To determine the percentage composition of a mixture consisting of a volatile and a non-volatile substances
3. Determine the viscosity of a given oil with the help of "Redwood viscometer"
4. Determine the flash point of the given oil with the help of Abel's Flash Point Apparatus
5. Estimate the amount of moisture in the given sample of coal
6. Estimate the amount of ash in the given sample of coal
7. Electroplate the given strip of Cu with Ni
8. Confirmation test of alcohol, aldehydes, carboxylic acid, amine

9. To determine the total acidity number of a lubricant
10. Detection of metal ions in the rust (solution of rust in concentrated HCl may be given)
11. To prepare Bakelite
12. To study the effect of metal coupling on corrosion of metals

## INSTRUCTIONAL STRATEGY

Teacher may take help of various models and charts while imparting instructions to make the concepts clear. More emphasis may be laid on discussing and explaining practical applications of various chemical processes and reactions. In addition, students should be encouraged/motivated to study those processes in more details, which may find practical applications in their future professional life.

## RECOMMENDED BOOKS

1. Chemistry in Engineering by J.C. Kuriacose and J. Rajaram; Tata McGraw-Hill Publishing Company Limited, New Delhi
2. Engineering Chemistry by Dr. S. Rabindra and Prof. B.K. Mishra ; Kumar and Kumar Publishers (P) Ltd. Bangalore-40
3. A Text Book of Applied Chemistry-I by SS Kumar; Tata McGraw Hill, Delhi
4. Progressive Applied Chemistry –I and II by Dr. G.H. Hugar; Eagle Prakashan, Jalandhar
5. Engineering Chemistry by Jain PC and Jain M Dhanpatrai publishers. New Delhi
6. Chemistry of Engineering by Aggarwal CV
7. Chemistry for Environmental Engineers by Swayer and McCarty, McGraw Hill, Delhi
8. A Text Book of Applied Chemistry-I by Sharma and Others; Technical Bureau of India, Jalandhar

## SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	08	16
2	10	20
3	06	14
4	06	14
5	04	08
6	06	12
7	08	16
<b>Total</b>	<b>48</b>	<b>100</b>



## 2.5 BASICS OF INFORMATION TECHNOLOGY

L T P  
- - 4

### RATIONALE

Information technology has great influence on all aspects of our life. Primary purpose of using computer is to make the life easier. Almost all work places and living environment are being computerized. The subject introduces the fundamentals of computer system for using various hardware and software components. In order to prepare diploma holders to work in these environments, it is essential that they are exposed to various aspects of information technology such as understanding the concept of information technology and its scope; operating a computer; use of various tools of MS Office/Open Office using internet etc. form the broad competency profile of diploma holders. This exposure will enable the students to enter their professions with confidence, live in a harmonious way and contribute to the productivity.

### Note:

**Explanation of Introductory part should be dovetailed with practical work. Following topics may be explained in the laboratory along with the practical exercises. There will not be any theory examination.**

### **TOPICS TO BE EXPLAINED THROUGH DEMONSTRATION**

1. Information Technology – its concept and scope, applications of IT, ethics and future with information technology
2. Impact of computer and IT in society.-- Computer application in office, book publishing, data analysis, accounting, investment, inventory control, graphics, air and railway ticket reservation, robotics, military, banks, Insurance financial transactions and many more
3. Generations of computer, block diagram of a computer, CPU, memory, data – numeric data, alpha numeric data; program, processing of data.
4. Computers for information storage, information seeking, information processing and information transmission, computer organization, computer hardware and software; primary and secondary memory: RAM, ROM, PROM etc. Input devices; keyboard, mouse, scanner, etc ; output devices ; VDU and Printer(Impact and non-Impact printers), Plotter etc. Primary and Secondary Storage (Auxiliary Storage), Secondary storage; magnetic disks – tracks and sectors, optical disk (CD, CD-RW and DVD Memory)
5. Introduction to Operating Systems such as MS-DOS and Windows, difference between DOS and Windows
6. Basics of Networking – LAN, MAN,WAN, Topologies

### **LIST OF PRACTICALS**

1. *Identify and list functions of various components and peripherals of given computer.*
2. Installation of operating system viz. \* Windows XP, \*Windows 2007 etc.

3. Installing a computer system by giving connection and loading the system-software and application software and various sources to install software

4. Exercises on entering text and data (Typing Practice)

Features of Windows as an operating system

- Start , shutdown and restore
- Creating and operating on the icons
- Opening, closing and sizing the windows
- Using elementary job commands like – creating, saving, modifying, renaming, finding and deleting a file , creating and operating on a folder
- Introduction to all properties such as changing settings like, date, time, colour (back ground and fore ground)
- Using short cuts

5. Word Processing (MS Office/Open Office)

File Management:

- Opening, creating and saving a document, locating files, copying contents in some different file(s),

Editing a document:

- Entering text, Cut, copy, paste using tool- bars

Formatting a document:

- Using different fonts, changing font size and colour, changing the appearance through bold/ italic/ underlined, highlighting a text, changing case, using subscript and superscript, using different underline methods
- Aligning of text in a document, justification of document ,Inserting bullets and numbering
- Formatting paragraph, inserting page breaks and column breaks, line spacing
- Use of headers, footers: Inserting footnote, end note, use of comments
- Inserting date, time, special symbols, importing graphic images, drawing tools

Tables and Borders:

- Creating a table, formatting cells, use of different border styles, shading in tables, merging of cells, partition of cells, inserting and deleting a row in a table
- Print preview, zoom, page set up, printing options
- Using Find, Replace options

6. Spread Sheet Processing (MS Office/Open Office)

Starting Excel

- open worksheet, enter, edit, data, formulae to calculate values, format data, create chart, printing chart, save worksheet, switching between different spread sheets

Menu commands:

- Create, format charts, organize, manage data, solving problem by analyzing data, creating graphs

Work books:

- Managing workbooks (create, open, close, save), working in work books, Editing a worksheet:
- copying, moving cells, pasting, inserting, deletion cells, rows, columns, find and replace text, numbers of cells, formatting worksheet

Creating a chart:

- Working with chart types, changing data in chart, formatting a chart, use chart to analyze data
- Using a list to organize data, sorting and filtering data in list

Formulas:

Addition, subtraction, division, multiplication, percentage and auto sum

## 7. PowerPoint Presentation (MS Office/Open Office)

- Introduction to PowerPoint
  - How to start PowerPoint
  - Working environment: concept of toolbars, slide layout, templates etc.
  - Opening a new/existing presentation
  - Different views for viewing slides in a presentation: normal, slide sorter etc.
- Addition, deletion and saving of slides
- Insertion of multimedia elements
  - Adding text boxes, importing pictures, movies and sound, tables and charts etc.
- Formatting slides
  - Text formatting, changing slide layout, changing slide colour scheme
  - Changing background, Applying design template
- How to view the slide show?

- Viewing the presentation using slide navigator, Slide transition
- Animation effects etc.

#### 8. Working with Data Processing (MS Office/Open Office)

- a) Understanding different data types
- b) Creation of table, entering data in a table and modify it.
- c) Retrieve data with query:
  - Create a pivot table, customizing a pivot table, statistical analysis of data
  - Exchange data with other application: embedding objects, linking to other applications, import, export document.

#### 9. Internet and its Applications

- a) Log-in to internet, introduction to search engine  
Browsing and down loading of information from internet
- b) Creating E-Mail Account
  - Log in to e-mail account and Log out from e-mail account
- c) Managing E mail
  - Creating a message
  - sending, receiving and forwarding a message
  - attaching a file
  - Deleting a message

### **INSTRUCTIONAL STRATEGY**

Since this subject is practice oriented, the teacher should demonstrate the capabilities of computers to students while doing practical exercises. The students should be made familiar with computer parts, peripherals, connectors etc. and proficient in making use of MS Office/Open Office in addition to working on internet. The student should be made capable of working on computers independently. This subject should be taught with the help of LCD projector, while teaching a group.

### **RECOMMENDED BOOKS**

1. Fundamentals of Computer by E Balagurusamy, Tata McGraw Hill Education Pvt Ltd , New Delhi
2. Fundamentals of Computer by V Rajaraman; Prentice Hall of India Pvt. Ltd., New Delhi
3. Computers Fundamentals Architecture and Organisation by B Ram, revised Edition, New Age International Publishers, New Delhi
4. Fundamentals of Computer by Sumita Arora by Dhanpat Rai and Co , New Delhi
5. Computers Today by SK Basandara, Galgotia Publication Pvt Ltd. Daryaganj, New Delhi.

6. Internet for Every One by Alexis Leon and Mathews Leon; Vikas Publishing House Pvt. Ltd., Jungpura, New Delhi
7. A First Course in Computer by Sanjay Saxena; Vikas Publishing House Pvt. Ltd., Jungpura, New Delhi
8. Computer Fundamentals by PK Sinha; BPB Publication, New Delhi
9. Fundamentals of Information Technology by Leon and Leon;Vikas Publishing House Pvt. Ltd., Jungpura, New Delhi
10. Fundamentals of Information Technology by Vipin Arora, Eagle Parkashan, Jalandhar
11. Basics of Information Technology, by Ishan Publications, Ambala
12. Information Technology for Management by Henery Lucas, 7<sup>th</sup> edition, Tata McGraw Hill Education Pvt Ltd , New Delhi

## 2.6 ENGINEERING DRAWING – II

L T P  
- - 6

### RATIONALE

Drawing is said to be the language of engineers and technicians. Reading and interpreting engineering drawing is their day-to-day responsibility. The course is aimed at developing basic graphic skills so as to enable them to use these skills in preparation of engineering drawings, their reading and interpretation SP 46 – 1988 should be followed

- Note: 1. First angle projection is to be followed  
2. Instructions relevant to various drawings may be given along with appropriate demonstration, before assigning drawing practice to the students

### DETAILED CONTENTS

1. Detail and Assembly Drawing (2 sheets)
  - 1.1 Principle and utility of detail and assembly drawings
  - 1.2 Wooden joints i.e. corner mortice and tenon joint, Tee halving joint, Mitre faced corner joint, Tee bridle joint, Crossed wooden joint, Cogged joint, Dovetail joint, Through Mortice and Tenon joint
2. Screw threads and threaded fasteners (8 sheets)
  - 2.1 Thread Terms and Nomenclature
    - 2.1.1 Types of threads-External and Internal threads, Right and Left hand threads (Actual and Conventional representation), single and multiple start threads.
    - 2.1.2 Different Forms of screw threads-V threads (B.S.W threads, B.A thread, American National and Metric thread), Square threads (square, Acme, Buttress and Knuckle thread)
  - 2.2 Nuts and Bolts
    - 2.2.1 Different views of hexagonal and square nuts and hexagonal headed bolt
    - 2.2.2 Assembly of Hexagonal headed bolt and Hexagonal nut with washer.
    - 2.2.3 Assembly of square headed bolt with hexagonal and with washer.

## 2.3 Locking Devices

2.3.1 Different types of locking devices-Lock nut, castle nut, split pin nut, locking plate, slotted nut and spring washer.

2.3.2 Foundations bolts-Rag bolt, Lewis bolt, curved bolt and eye bolt.

## 2.4 Drawing of various types of machine screw, set screw, studs and washers

## 3. Keys and Cotters (3 sheets)

3.1 Various types of keys and cotters and their practical application and preparation of drawing of various keys and cotters showing keys and cotters in position

### 3.2 Various types of joints (3 sheets)

- Spigot and socket joint
- Gib and cotter joint
- Knuckle joint

## 4. Rivets and Riveted Joints (4 sheets)

4.1 Types of general purpose-rivets heads (4 Sheets)

4.2 Caulking and fullering of riveted joints

4.3 Types of riveted joints

- (i) Lap joint-Single riveted, double riveted (chain and zig-zag type)
- (ii) Butt Joint-
  - (a) Single cover plate
    - (i) Single riveted joint
    - (ii) Double riveted joint (Chain and zig-zag type)
  - (b) Double cover plate
    - (i) Single riveted joint
    - (ii) Double riveted joint (Chain and zig-zag type)

## 5. Couplings (2 sheets)

5.1 Flange coupling (Protected and non-protected)

## 6. Symbols and Conventions (2 sheets)

6.1 Civil engineering sanitary fitting symbols

6.2 Electrical fitting symbols for domestic interior installations

6.3 Building plan drawing with electrical and civil engineering symbols

## 7. AUTO CAD (for practical and viva-voce only)

7.1 Concept of AutoCAD, Tool bars in AutoCAD, coordinate system, snap, grid, and ortho mode

7.2 Drawing commands – point, line, arc, circle, ellipse

7.3 Editing commands – scale, erase, copy, stretch, lengthen and explode

### **RECOMMENDED BOOKS**

1. Elementary Engineering Drawing (in first angle projection) by ND Bhatt, Charotar Publishing House
2. A Text Book of Engineering Drawing by Surjit Singh Published by Dhanpat Rai and Co. Delhi
3. Engineering Drawing by PS Gill; published by SK kataria and Sons, New Delhi
4. Machine Drawing by RB Gupta published by Satya Prakashan, New Delhi.



## 2.7 BASICS OF DESIGN AND COLOUR

L T P  
- - 6

### RATIONALE

Textile designing is an important part of textile field. In this subject, students are given an understanding of various elements and concepts of colour and designing which develop their competency to create ideas for designing and enriching their aesthetic and colour sense according to market point of view.

The colour and design work will be displayed on display boards and be changed every 15/30 days.

NOTE: Teachers will provide theoretical instructions along with practice and demonstration/ illustration.

### DETAILED CONTENTS

Sr. No.	Theory (Instructions)	Practical
	<b>Part-I : Design</b>	
1.	Basic elements of drawing and design-line, colour, texture and shape, Understanding of principles of design-Rhythm, Balance, Harmony, Unity, Emphasis, Proportion, Colour combination to form a good composition.	Teachers will illustrate and discuss the basic concept of drawing and designing with the help of replicas pictures, paintings, designs, etc., which help the students to create suitable and good Designs.
2.	Study of objects in nature like leaves, flowers, vegetables, fruits, animals, birds etc.	Students will practice the following topics on separate drawing sheets by observing them in nature or by taking references from various books, charts, pictures,etc. At least one sheet of each topic will be prepared by students in pencil drawing. <ul style="list-style-type: none"><li>- Sketching of different type of leaves</li><li>- Sketching of different types of flowers.</li><li>- Sketching of different types of vegetables</li><li>- Sketching of different types of fruits</li><li>- Sketching of different types of animals</li><li>- Sketching of different types of birds</li></ul>
3.	Unit and Repeat of design	Students will learn to select unit or repeat from various samples

4.	Understanding various styles of designs <ul style="list-style-type: none"> <li>- Natural (realistic)</li> <li>- Conventional (Oriental)</li> <li>- Geometrical</li> <li>- Abstract</li> <li>- Traditional</li> <li>- Folk</li> <li>- Symbolic</li> </ul>	Student will make at least three motifs based on each different style by using various colour schemes
5.	Change of one style of design to another	Students will practice to change natural forms into conventional, geometrical and abstract forms
6.	Construction and arrangement of designs on various basis <ul style="list-style-type: none"> <li>- Drop base</li> <li>- Half drop base</li> <li>- Drop reverse base</li> <li>- Sateen base</li> </ul>	Students will do practice on construction of designs on various basis
7.	Enlargement and reduction of designs	Students will practice to make various designs into enlarged and reduced sizes
<b>Part-II : Colour</b>		
1.	Light and colour phenomena and the physical basis of colour	Teacher will illustrate the basic concepts of colour theory with the help of diagrams, charts, pictures etc
2.	Introduction of 'Colour Vision Theory' and 'Pigment Theory'	Teacher will discuss the basic concepts of both the theories with the help of diagrams and charts
3.	Classification of Colours	Students will prepare a chart of classification of colours using poster colours on drawing sheet
4.	Chromatic Circle	Students will prepare a chart of chromatic circle on drawing sheet by using poster colours
5.	Colour measurement	Teacher will discuss with students various elements of colour measurement
6.	Attributes of primary and secondary colours	Teacher will discuss various attributes of primary and secondary colours with students

7.	Methods of modification of colours	Students will practice to produce various hues, tints, tones, shades, broken-hues by mixing various colours in various ratio
8.	<ul style="list-style-type: none"> <li>- Cool colours and warm colours</li> <li>- Analogous and contrasting colour</li> <li>- Complementary colour</li> <li>- Advancing and receding colour</li> </ul>	Students will learn the concepts of cool colours, warm colours, analogous and contrasting colours, complementary colours, advancing and receding colours through different practices.
9.	Colour in combination <ul style="list-style-type: none"> <li>- Colour Harmonies</li> <li>- Monochromatic, polychromatic and Achromatic colour schemes</li> <li>- Analogous and Contrast colour schemes</li> <li>- Complementary colour scheme</li> <li>- Split complementary colour scheme</li> <li>- Double split complementary colour scheme</li> <li>- Cool and warm colour scheme</li> </ul>	Students will practice these different colour schemes while preparing the various motifs of designs under topic 3 to 7 of Part-I (Design)
10.	Colour ways	Students will practice to make some samples of designs in different colour ways
11.	Application of various textures, lines and shapes for creation of designs	Students will practice to create designs using various lines, textures and shapes.

## INSTRUCTIONAL STRATEGY

Students should be taken for field visits like museums, exhibitions, emporiums etc. for clarifying the concepts and principles of this course as per requirement. There will be only practical paper in this subject. The knowledge attained by students regarding related theory for practical exercises will be evaluated in the form of viva-voce during practical examinations.

## RECOMMENDED BOOKS

1. Colour Harmony (A guide to creative colour combination) by Hideaki Chijiiwa.
2. Designer's Guide to Colour-II by Jeanne Allen
3. Designer's Guide to Colour-III by Jeanne Allen
4. Designer's Guide to Colour-IV by Shibukawa and Takahashi
5. Designer's Guide to Colour-V by Shibukawa and Takahashi
6. An introduction to Colour by Ralph M Evans

7. Patterns (Designer's Guide to Japanese by Jeanne Allen)
8. Traditional Indian Motifs by K Parkash; Bombay Publication
9. Textile Designs (Idea and Applications) by Jokel Sokolov; Hearts Book International, 1350, Avenue of the Americas, New York, NY 10019
10. Anupam Nature Drawing by KV Kamble; JS Gala, Gala Publishers Ahmadabad 380021
11. Anupam Freehand Drawing by KV Kamble; J.S. Gala, J S Gala Publishers Ahmadabad 380021
12. Anupam Design Drawing by KV Kamble; JS Gala, Gala Publishers, Ahmadabad 380021
13. Alankar Series Vol.1,2,3,4,5,11 by Chamankiran; Kala Bhawan, Chaman School of Art, Zeemkhana, Ground, Meerut
14. Alankar (Textile Design) by Chamankiran; Kala Bhawan, Chaman School of Art, Zeemkhana, Ground, Meerut
15. Dhawan's Art Bool Vol.1,3,4,5 by Avtar Dhwan; Tip Top Trading Company, RK Dhawan;s Building Sangala Shivala Raod, Ludhiana
16. Costumes and Textile Designs of India, by Paul Bhatnagar; Abhishak Publication Chandigarh.