C O N T E N T S

MAIN FEATURES OF THE CURRICULUM

1. Title of the Course : Diploma In Computer Science & Enginnering.

2. Duration of the Course : Three Years

3. Type of the Course : Full Time Institutional

4. Pattern of the Course : Anual System

5. Intake : 60

6. Entry Qualification : High School 10+ with Science Two and Mathematics Two.

7. Admission Criteria : State Joint Entrance Examination

III   LIST OF EXPERTS

1. Dr. A.S. Darbari   Manager, Darbari   Dhuman Ganj,

2. Prof. R.M.K. Sinha   Prof & Head   I.I.T.,
                           Computer Science And   Kanpur
                           Engineering Deptt.

3. Prof. R.N. Biswas   Prof & Head   I.I.T.,
                           Electrical Engg. Deptt.   Kanpur

4. Prof. K.K. Bhutani   Prof & Head, Computer   Muir College
Campus
                           Centre   Allahabad
University
                                                     Allahabad.

5. Prof. K. K. Tripathi   Prof. & Head,Electronics H.B.T.I., Kanpur
                           Engineering Deptt.

6. Prof. V. K. Jain   Prof. & Head, Computer   H.B.T.I., Kanpur
                           Science & Engg. Deptt.

7.	Shri R. S. Verma	Engineer, Computer Division	Uptron India Ltd., Lucknow.
8.	Shri Prasant Kumar Arya	H.C.L. Ltd., Lucknow	
9.	Shri Arunara Ray	AMALCO (H.C.L. Ltd.,) Lucknow	
10.	Shri R. C. Yadav	Sr. Engineer, Computer Centre	M.C.C., Allahabad University, Allahabad.
11.	Shri Bal Gopal	Asstt. Prof. Electronics Engineering Deptt.	H.B.T.I., Kanpur
12.	Shri Girish Chandra	Lecturer,J.K Institute of Applied Physics	Allahabad Uni. Allahabad.
13.	Shri C. K. Dwivedi	Lecturer,J.K Institute of Applied Physics	Allahabad Uni. Allahabad.
14.	Shri Om Prakash	Head, Instrumentation & Control Engineering	I.E.R.T., Allahabad
15.	Shri P. K. Srivastava	Head, Electronics Engineering Deptt.	I.E.R.T., Allahabad
16.	Prof. P. K. Singh	Head, Computer Science	I.E.R.T., Allahabad
17.	Shri G. S. Rai	Head, Electronics Engg.	Govt. Poly.,Pilibhit
18.	Shri S. C. Gupta	Asstt. Director	Directorate of Technical Kanpur.
19.	Shri S. C. Tewari	Lecturer, Electronics	Govt. Polytechnic, Fatehpur
20.	Shri Akhilesh Verma	Lecturer, Electronics	Govt. Polytechnic, Narendra Nagar, Tehri Garhwal

List of Experts who contributed in the revision of curriculum of Three year Diploma in Computer Engg.

1.	Shri S. P. Khattri	Sr. Manager (Systems)	U. P. Development Systems Corporation Ltd., Lucknow
2.	Shri OM Prakash	Retd.Head (I.C.)	I.E.R.T.,Allahabad
3.	Shri D.K.Rudra	H.O.D.(I.C.)	I.E.R.T.,Allahabad
4.	Shri R.K.Singh	Lect. Computer	H.B.T.I.,Kanpur
5.	Shri S.R.Gautam	Head (I.C.)	Govt. Poly. Kanpur
6.	Shri S. K. Verma	Professor	Institute of Research Development & Training U.P., Kanpur
7.	Shri S.C.Gupta	Head (Computer)	Govt. Poly. Unnao
8.	Shri S.K.Verma	Professor	I.R.D.T.,U.P.,Kanpur Kanpur
8.	Shri L.S.Yadaw	Lecturer (Computer)	Govt. Polytechnic Kanpur
9.	Shri Ashraf Ali	Lect. Computer	I.R.D.T.,U.P.,Kanpur

the members of the committee recommended its being adopted after a few ammendments which have been incorporated in the curriculum.

List of experts who contributed in the revision of curriculum of Three Year Diploma in Computer Science & Engineering on dated 8.2.1999.The members of the committee recommended its being adopted after a few ammendments which have been incorporated in the curriculum.

1. Smt. Usha Birjee	Director. I.R.D.T.,U.P. Kanpur.
2. Dr. R.Tiwari	Operation Manager I.I.T.,Kanpur
3. Dr. S.Tiwari	Hony.Faculty I.E.T./S.J.M.University Kanpur.
4. Dr. S.K.Bajpai	Professor(Computer) I.E.T.,Lucknow.
5. Shri. D.S.Yadav	Lecturer (Computer) I.E.T,Lucknow.
6. Shri Subhash Chandra Gupta	Assistant Director

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                                  D.T.E.,Kanpur.
7. Shri  S.C.Gupta                Assistant Director
                                  D.T.E.,Kanpur
8. Shri L.S.Yadav                 Head(Computer)
                                  Govt.Polytechnic,Kanpur.
9. Shri D.S.Kushwaha              Lecturer(Computer)
                                  D.T.E.,U.P.,Kanpur
10.Shri J.P.Yadav                 Dy.Director
                                  I.R.D.T.,U.P.Kanpur.
11.Shri M.R.Khurana              Asst. Professor
                                  I.R.D.T.,U.P.Kanpur.
12.Shri M.P.Singh                 Asst. Professor
                                  I.R.D.T.,U.P.Kanpur.
13.Shri Ashraf Ali                Professor
                                  I.R.D.T.,U.P.Kanpur.
14.Shri K.M.Gupta                 Asstt.Professor
                                  I.R.D.T.,U.P.Kanpur.
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List of experts who contributed TO Change the of curriculum
of Three Years Diploma in Computer Science & Engineering to
Semester System held on 17.04.99.

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1. Smt. Usha Birjee               Director.
                                  I.R.D.T.,U.P. Kanpur.
2. Shri R.K.Singh                 Asstt.professor
                                  M.M.M.Engg. College Gorakhpur
3. Shri  S.C.Gupta                Assistant Director
                                  D.T.E.,Kanpur
4. Shri L.S.Yadav                 Head(Computer)
                                  Govt.Polytechnic,Kanpur.
5. Shri B.R.Verma                 Head(Computer)
                                  Govt.Polytechnic,Jhanshi.
6.  Shri D.S.Kushwaha             Lecturer(Computer)
                                  D.T.E.,U.P.,Kanpur
7. Shri S.N.Singh                 Lecturer(Computer)
                                  Govt.Polytechnic, Unnao.
8. Shri J.P.Yadav                 Dy.Director
                                  I.R.D.T.,U.P.Kanpur.
9. Shri Ashraf Ali                Professor
                                  I.R.D.T.,U.P.Kanpur.
10.Shri M.P.Singh                 Asst. Professor
                                  I.R.D.T.,U.P.Kanpur.
11 Shri K.M.Gupta                 Asst.Professor
                                  I.R.D.T.,U.P.Kanpur.
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List of experts who contributed   to Change the   of
curriculum   of Three Year Diploma in Computer Science &
Engineering held on 27.02.2003 at I.R.D.T . U.P., Kanpur.

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1. Shri Gurdeep Singh             Director.
                                  I.R.D.T.,U.P. Kanpur.
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2. Shri Rajeev Misra	Head of Department
	Information Technology
	H.B.T.I.Kanpur
3. Shri Raghu Raj Singh	Head of Department
	Computer Science & Engg.
	H.B.T.I.Kanpur.
4. Shri S. C. GUPTA	HOD Computer Science & Engg.
	Dr. Ambedkar Institute of Technology for handicapped, Kanpur
5. Shri M.A. Idrees	Senior System Analyst
	NIC, Yojna Bhawan
	Lucknow.
6. Shri Alok Tiwari	District Informatics Officer
	Kanpur Dehat.
7. Shri B.R. Verma	Head Computer
	Govt. Polytechnic Lucknow
8. Shri L.S. Yadav	Head Computer
	Govt. Polytechnic Kanpur
9. Shri Saurabh Agrawal	Lecturer Computer
	United Institute of Designing Kanpur
10. Shri Ashok Kushwaha	Lecturer Computer
	Govt. Girls Polytechnic Lucknow
11. Shri Ashraf Ali	Professor
	I.R.D.T.,U.P.Kanpur.

List of experts who contributed   to Change the   of curriculum of Three Years Diploma Course in Computer Scinece & Engineering held on 15.10.2003 at I.R.D.T . U.P., Kanpur.

1. Shri Alok Tiwari	District Informatics Officer
	Kanpur Dehat.
2. Shri B.R. Verma	Head Computer
	Govt. Polytechnic Lucknow
3. Shri D. Singh	Head Computer
	Govt. Girls Polytechnic, Allahabad
4. Shri S. N. Singh	Head Computer
	Govt. Polytechnic Unnao
5. Shri L.S. Yadav	Head Computer
	Govt. Polytechnic Kanpur
6. Shri Saurabh Agrawal	Lecturer Computer
	United Institute of Designing Kanpur
7. Shri Alok Gupta	HIG 174, Kalish Vihar, Kalyanpur, Kanpur
8. Shri R. Goel	Programmer, I.E.T.,Lucknow
9. Shri Ashraf Ali	Professor
	I.R.D.T., Kanpur

List of experts who contributed to Change the of curriculum of Three Years Diploma Course in Computer Scinece & Engineering held on 15.11.2007 and 16.11.2007 at I.R.D.T . U.P., Kanpur.

1. Shri Ashraf Ali   Head (Computer)
                                Govt. Girls Poly., Lucknow
2. Shri L.S. Yadav   Head Computer
                                Govt. Polytechnic,Lucknow
3. Shri B.R. Verma   Head Computer/Asstt. Director
                                D. T. E., Kanpur
4. Shri Alok Tiwari   District Informatics Officer
                                Kanpur Dehat.
5. Shri Jitendra Kumar   Sr. Manager
                                U. P. Tech, Mall Road, Kanpur
6. Shri Kurunesh Yadav   Lecturer, G.G.P., Lucknow
7. Shri Ashok Kushwaha   Lecturer, G.G.P., Lucknow
8. Shri S. K. Agarwal   Lecturer, G.G.P., Allahabad
9. Smt Sarla Agarwal   Lecturer(Electronics),
                                Govt. Poly., Barillary
10. Smt. R. P. Alam.   Assistant Professor
                                I. R. D. T., Kanpur

IV. NEED ANALYSIS :

With the development of civilisation, human needs to keep on increasing thier fulfilment needed simulation, analysis of lot of informations too became essential. Now the individual responsbilities of every responsible citizen grew up to such a light that it is difficult for him to handle them successfully. Human memory too has its own limitations. So here comes the computer to help in all kind of decision making, whether it is highly complicated research work, war strategy, market speculations or day-to-day need of human life etc. As a matter of fact every individual activity needs decision making. So the computer

is the need of organisations and also the need of individual being. It will not be exaggeration if we say that it is "Computer era". So is the need for developing a course for computer engineering at diploma level. The course aims to develop perssonnels, capable of taking responsibilities such as installation repair and maintenance and operating computer units. It is supposed that such personnel will not face any dearth of employment because of omnipresent nature of computer.

The syllabus for diploma in computer Engineering has been developed to meet above mentioned aims. Obviously achievement of any aim requires knowledge of the means and procedures of thier utilisation. With this view various courses have been carefully selected and thier length and depth decided by experienced experts in the field.

V. PROFILE DEVELOPMENT :

A tool in the form of questionaire for getting information about job potential, job opportunities, man power requirements and job activities of Diploma holder in Computer Engineering was designed and sent to various organisations, industries, higher technological Institutions and Polytechnics. The response was not very much encouraging. So efforts were made to get feed back through mutual interaction with the experts of above organisations, industries, higher technological institutes and polytechnics. The feed back received was discussed and analysed in a workshop and a draft curriculum was prepared adopting the following procedure.

1. Listing job potential and job activities.

2. Analysing activities into knowledge and skill.

3. Determining course objectives.

4. Planning horizontal and vertical organisation of the subjects.

5. Developing study and evaluation scheme.

6. Development of detailed course content and coverage time keeping in view the knowledge and skill requirement.

7. Determination of resource input in the form of human resource, space, equipment etc.

The so prepared curriculum was sent for comments of experts in various higher technological institutions and senior personnels in industries. The suggestions thus recieved and those through personal contacts were incarporated where found suitable. Finally revised curriculum was put before an exspert Committee approved by the "Government of Utter Pradesh" for its final approval. The Committees suggestions though very nominal too were respectfully incarporated to give it its final shape.

It is hoped that revised curriculum of Diploma in Computer Engineering will be useful in producing middle level manpower for world of work.

VI. JOB POTENTIAL/JOB OPORTUNITIES

JOB POTENTIAL

Background Information Regarding Computer Industry:

Most of the industries in computer area are in private sector. The job designations are not standard. They change from firm to firm depending upon the size of firm and the nature of work, the firm is engaged in R & D or marketing software development etc. In general the jobs for a diploma holdder in Computer engineering are available in the following areas :

i.   Service Division.
     Maintenance, service and installation of computer system.
ii. Production and Quality Control Division.
iii. Marketing division.
iv. Commercial (stores, purchase and pricing)
 v. Research and Development.

Assessment of job potential from Computer Industry:

A questionnaries was sent to 30 different industries dealing with different aspects of Computer Engineering. On the basis of information collected and discussions held during the

visits to these industries a chart showing manpower spectrum of some of the computer industries has been prepared. This chart is attached here. In this chart a typical manpower employment in computer is shown. It also shows the relative position of the personnels in computer field. The nomenclature of the designations is by no means standard and the chart only indcates their relatives position.

JOB OPPORTUNITIES

The possible job opportunities for the product of this curriculum are

1.3.1. Junior engineer/Design Assistant/Senior Technical Assistant in R&D, Quality Control and Testing activities.

1.3.2. Shopfloor manger/Assembly supervisor in manufacturing and production Activities.

1.3.3. Installation Engineer/Service Engineer/Junior Engineer/ Junior Service Engineer in installation,Service and Custom Support Activities.

1.3.4. Junior Marketing Executive/Junior Purchase Officer/Junior Stores Officer in Marketing and Commercial activities

ACTIVITIES/JOB DESCRIPTION

Service Division:

Maintenance, service and installation of computer systems

Identify hardware and software faults and rectify them.

Suggests the desirable changes in the design in view of this maintenance experiences.

Rectify fault by component and card level.

Advises the customer on site preparation and checks the site.

Install the systems and tests its operation.

Train the customer in the operation and the use of the system.
 Production and Quality Control:

Indenting the material from stores and schedule the work of skilled workers.

- Fault finding in assembly work by visual inspection.

- Guiding skilled workers in component identification, component testing and precision assembly work.

- Fabricate (if required) test and interconnect different sub-assemblies and subsystems like power supply, interface, processor and memory units, video display unit, printer, plotter, graphic monitor, hard disc drives interface etc.

- Managing personnel like technicians and skilled workers.

Marketing:

- Meeting with prospective customer under the guidance of sales engineer.

- Arranging demonstration at the site of customer.

Commercial:

- Assists sales engineer in the sales of computer system (Contacts customer, arranges demonstration, preparation of technical documents and specification.

- Purchase material (writes specifications, receiving quotations, prepares and checks comparative statements, checks bills).

- Prepare bill for service charges and cost of materials used.

- Incoming inspection (checking quality, quantity and specification of the material supplied against orders).

- Maintains stocks and records.

Research & Development Work:

- Design simple microprocessor based subsystem (without optimisation) under the guidance of design engineer.

- Printed circuit board (PCB) layout design under the guidance of design engineer.

- Fabricates prototype of a subsystem or system.

- Plans flow of activities for production along with engineer.

- Test systems at card level, subsystem level and at complete

system level.

- Documents the layouts, circuit diagram, procedures and processes.

- Develops systems software, the line drivers and interface with the guidance from engineer and runs it.

- Communicates with engineer and assists him in converting technical ideas into practical shape.

- Assist engineer in laying test procedures, tests standards and maintaining the quality of the products.

VII. JOB ACTIVITIES & ACTIVITY ANALYSIS:

ACTIVITY   KNOWLEDGE   SKILLS
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1. Service Division (Maintenance, Service & Installation of
    Computer:

1.1 Identify hardware &   Working of the total   Using diagnostic routines
    software faults &   System CPU, peripherals for fault location and
    rectify them.   interfaces &   system identifying the fault at
                           software.   sub system level, card
                                                   level, chip level, user
                                                   level.

1.2 Suggests the desirable Faults diagnoses proce- Use of test equipment for
    change in the design   dure including introdu- fault location.
    in   view   of   his ction of fault and fault
    maintenance experience. diagnosis logics.

                           Diagnostics methods of Study of literature (HW &
                           running   them   and SW) aspects and adapt the
                           interpreting   the engineering change notes.
                           results.

                           Fault identification at Preventive maintenance.
                           system level subsystem
                           level,   card   level
                           component level & user
                           level.

                           Error   rates   in
                           communication peripher-
                           als.

1.3 Rectify   fault   at Data communication

component & card level. equipments.

Data communication principles, spare parts & identification.

Use & knowledge of tools and test equipment for maintenance including PBRS equipement.

Understanding and implementing engineer-ing change notes for both hardware & software.

Performance measurement of computer system.

ACTIVITY   KNOWLEDGE   SKILLS

Preventive maintenance   Maintenance of log regi-
schedules and its   ster and complaint repo-
consequence, knowledge   rting systems maintenance
of terms like MTBF,   of user.
MTRR, response time,

Cost of down time.

Log maintenance (Sympt-
oms, diagnosis and
corrective action).

Maintenance procedures
and techniques for CPU,
peripherals, interfaces
power supplies.

Complaint reporting
system, performance
reporting system.

Maintain ability of

system   software,
updating   and   its
consequences   user
accounting.

Installation

	ACTIVITY	KNOWLEDGE	SKILLS
1.4	Advise the customer site preparation & check the site.	Layout considerations & planning influence of factor like vibration humidity, airconditioning systems on system performance, measurement, dust prevention specification in regard to above. Comparative study of air conditioning system such as window & A.C. plant and package, power disturbances earthing & its specifications. Single, Three Phase supplies, isolation stablizers switches, power distribution system and components and materials safety design. Low power transformer, Servo regulated power supplies.	Communication skills oral & written. Measurement of humidity, vibration, temperature, dust, testing of earthing isolation, prepare wiring diagram & trace the wiring system Operate various test equipment, A/C system voltage regulators and isolation transformers. Wiring & preparation of wiring diagrams

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	ACTIVITY	KNOWLEDGE	SKILLS
1.5	Installs the system & test its operation.	Wiring, interpretaion of installation & wiring drawings. Knowledge procedures.	Install the systems, run diagnostics, run system software, rectification of faults, train operators
1.6	Trains the customers in the operation and use of system.	Principles of working of operation of each system and sub system.	Practice in using computer system.

2.   Production & Quality Control:

ACTIVITY	KNOWLEDGE	SKILLS
2.1 Identing the material from stores and schedule the work of skilled workers.	Concept of production document, drawing concepts principles of working of the components (ICs, discreate components, active passive and metal ware).	Practice of reading, drawing, knowledge of English.
2.2 Fault finding in assembly work by visual inspection.	Material used in assembly process. Handling of LSI and other components.	Practice in soldering & desoldering work.
2.3 Guiding skilled workers in component identification, component testing and precision assembly work.	Reading electronic drawing. Terminology, symbols, correlate the drawing with related components.	Component identification colour code of registor capacitor.
2.4 Fabricates, (if required) test & interconnects different subassemblies and sub system like power supply, interfaces, processor and memory units, video display unit, printer, plotter, graphic monitor, hard disc, drive interfaces etc.	System block diagram, function of each block run diagnsotic programme, diode errors, operation of test equipments like storage oscilloscope logic analyser, logic probe, meters, DBO, oscillator, pulse generator Block diagram of software, linear circuits different devices & digital circuit & microprocessors, magnetic recording techniques, knowledge of assemblers.	Practice in using equipments (Electronic as well as special type), able to write & run a small programme in assembly & high level language (BASIC & COBOL).
2.5 Managing personnel like junior technicians and skilled workers.	Concepts of Human relations, dignity of labour.	

ACTIVITY	KNOWLEDGE	SKILLS
3. Marketting		
3.1 Meeting with prespective customer under	Commerical term, types of payments, insurance	Practice in operation of small computer.

	the guidance of sales engineer.	communication skill, command on language advertising technique communicate computer specifications (including various peripherals) understanding of customers application. Analyse specifications, vis-a-vis other computer.	
3.2	Arranging demonstrations at the site of customer.		
4.	Commercial		
4.1	Assists sales engineer in the sales of computer system (Contacts customer arrange demonstrations, preparation of documents & specifications).		
4.2	Purchase & sales of computer system (Contact customer, arrnage demonstration).	Source of supply knowledge of & writing detailed specifications of the materials & equipment needed in computer manufacture; computer peripherals, import procedures. Document preparation for quotations, specifications & demonstration of systems.	Written communication skill. Understand customer needs. Demonstrate the systems. Quotation preparation & ordering equipment.
4.3	Prepares bills for service charge and cost of material.	Commerical terms like FOR, FOB, Desitnation terms of sales & purchase, Sales tax income tax procedure.	Practice in using various forms.
4.4	Incoming inspection (inclucing checking qulaity, quantity and specifications of the material supplied against orders).	Read specification, data sheet, component testing procedures. Specifications of components, identification of components, stores entries.	Practice in the operation of instruments, testing of component, error report preparation.

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--------------------------------------------------------------------------
ACTIVITY                  KNOWLEDGE                 SKILLS
--------------------------------------------------------------------------
                          Component identification,
                          detailed  specification,
                          storage   systems    of
                          components.

4.5  Maintains stocks  and   Registers, their types &   Practice in dealing with
     records.                method  of   maintaining   different entries in the
                             entries.                    registers, inventory
                                                         control.

5.   R & D

5.1  Design    simple    up   Digital logic design,      Working with digital
     based     sub   system   Microprocessor, computer   linear and up circuits
     without   optimisation   architecture system int-   using VLSI, LSI, MSI
     under the guidance of    egration, Application      chips, for a particular
     engineer.                areas, design of  memory   use, Acquiring informa-
                              boards        peripheral   tion regarding the chips
                              interfacing   techniques   from data books/sheets.
                              using mannuals,chip, chip   Chip subsituation,Inter-
                              substation, situation data  facing of peripherals and
                              communication   modules,    information regarding
                              multiplexers, A/D &  D/A    interfacting chips.
                              base           standards,
                              Communication protocols,
                              Characteristics of comp-
                              onents, noise levels and
                              causes.

5.2  PCB    layout   design   Noise, Noise levels &      Drawing layouts, practice
     under the guidance of    cause, principles of       in making the layouts.
     design engineer          PCB design, familiarity
                              with chips, knowledge of
                              connectors, Knowledge of
                              PC boards, Knowledge  of
                              PCB  drafting  aids  and
                              drafting      techniques,
                              back     pannels      and
                              multiboard       modules.
                              Standard PCB size.

5.3  Fabricates prototype   Mechanical packaging,        Soldering & Desoldering
     of  a  subsystem   or   considerations in           techniques component
     system        (Contact   packaging & design,         mounting chassis fabrica-
     customer,      arrange   organise a small work-      tions, drilling & surface
     demonstration).          shop,   draw   flow   of    treatment of PCBs. Wire
                              activities, guide, small    wrapping techniques,
                              groups  in  fabrication,    screen printing, paint-
                              wire  wrapping. Thermal     ing. Testing of PCB
                              properties of metals and    circuit.
```

components.   Mounting
modes fuse and safety
devices.   Connector,
cables and wiring, HDS.

ACTIVITY   KNOWLEDGE   SKILLS

5.4 Plans flow of activi- PERT, time consciousness
     ties for production knowledge of production
     along with engineer.   activities.

5.5 Test system at card Locating faults, identi-   Fault finding in PCBs,
     level,   sub-system fication of causes (com-   use of test equipment.
     systemsnlevel.omplete testnequipmentiincluding
                            programmable   test
                            equipment and calibra-
                            tion of test equipment.
                            Interpretation of test
                            results.   Visible
                            defects,   chips   and
                            equivalent chips. Noise
                            cause.

5.6 Documents the layouts Documentation of test   Documentation skills.
     circuit diagrams, pr- equipments, test pro-
     ocedures and process- cedure, flow activiti-
     es.   es,   quality   control
                            standard computer equipm-
                            ent   and   diagnestics
                            programmes   of   system
                            software.

5.7 Develops system soft- Fundamentals of program-   Programme wirting debugg-
     ware,   the   line ming, logic, programming   ing skills in high level
     drivers & interfaces language, applications,   & assembly languages.
     with   the   guidance Knowledge   of   system   Documentation of program-
     from   engineer   and   software, operating   mes. Modification and
     runs it.   systems,   compilers   adaption of software.
                             drivers and other system
                             software. Efficient use
                             of   system   software,
                             write small diagnostic
                             programmes   to   test
                             system, generation and
                             running   of   system
                             software, knowledge of
                             application packages and
                             their running. Assembly

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                        and    machine   language
                        programming.
                        Modification &  adaption
                        of software.

5.8   Communicates    with   Understand the language    Fabricatory skills,
      engineers and  assist   of the engineer.           Coding skills,
      him   in   converting                              Translative skills.
      technical ideas  into   Understand the drawing,    Modification and
      practical shape.        notation specifications    adoption of circuits
                                                         and programs.
                              Fabricate, translate  or
                              code    as    per    the
                              specification        use
                              modules, sub  assemblies
                              written/prepared by  others.
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-----------------------------------------------------------------------------
ACTIVITY                      KNOWLEDGE                  SKILLS
-----------------------------------------------------------------------------

5.9   Assists  engineer  in   Quality control, quality   Testing for quality.
      laying test  procedu-   checking procedures and
      res,  test  standards   standards.                 Documentation & reporting
      and maintaining the                                skills
      quality   of   the      Documentation of test
      products.               procedures reporting.      Fabricate circuits, test
                                                         the circuits make PCBs.
                              Effect of environment on
                              the    behaviour    of
                              components and systems.
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VIII.COURSE OBJECTIVE:

Preceding section details the knowledge and skills required
for middle level personnel of computer   industry. The
objectives are derived which deserve greater weightage are
marked with asterisk.

Course   objectives   lay   the   foundation   for   planning
educational programme.

1.   Knowledge:

1.1   He must acquire basic concepts in electronic drawing

(including standard symbols for electronic components active as well as passive).

1.2 He must acquire basic concepts and principles of working of linear and digital circuits using discrete components and integrated circuits.

1.3 He must have the knowledge of testing procedure of active and passive components, (including integrated circuits) discreate and digital circuits by making use of different test instruments as per to their specification.

1.4 He must acquire knowledge of system block diagram and working principles of different computer peripherals.

1.5 He must acquire the knowledge of making P.C.B. layouts and learn drafting techniques.

1.6 He must acquire the knowledge of efficient use of system software by writing a small diagnostic programme to test system.

1.7 He must acquire the knowledge of working principles of the total system i.e. C.P.U., peripherals, interfaces and system software.

2. Skill

2.1 He must acquire skill in finding faults in a computer system. The fault may be at component level or at card level or at sub system level. After finding fault he must be able to repair to it.

2.2 He must acquire skill in preparation of site for installation of a computer.

2.3 He must acquire skill in installing different subsystem (Power supply, Video display unit, C.P.U. , Printer, Plotter, Graphic monitor, Disc drives etc.).

2.4 He must acquire skill in operating and testing the working of different subsystems installed.

2.5 He must acquire skill making (or designing) layout on printer circuits board for a given electronic circuit.

2.6 He must acquire skill in fabricating (electronic circuit using different electronic components including ICs) on a

printed circuit board according to a giveen circuit diagram.

2.7 He must acquire skill testing the performance of an electronic circuit fabricated on a printed circuit board making use of different electronic instruments.

3. Attiude:

3.1 He should have open minded approach while finding fault in the system.

3.2 He should have analytical approach while dealing with any problem.

3.3 He should be a keen observer while finding fault with the system and circuits.

3.4 He should have habit of reading commerical and technical literature regarding computer.

COURSE OBJECTIVE	CURRICULUM AREA		
	Specialised Tech. Area	Core Engg. For Computer Engineering	Basic Engg. Science Subject
1.1 He must have acquire basic concept in Electronic Drawing (including standard symbols for electronic components (active as well as passive).	Electronic component & Material		Basic Engineering Applied El- Physics Drawing, ectrical & Electronic Drawing.
1.2 He must acquire basic concepts and princip-	Electronic Devices &		Electrical Applied Engineering Physics,

Applied Mathema- tics	les of working of linear and digital circuits using discrete components & integrated circuits.		ckts princ- iples of di- gital elec- tronics.	
1.3 Electron-	He must have the knowledge of testing procedure of active and passive components (including integrated circuits) by making use of different test instruments as per to their specification.		Electronic Device & circuits; digital ckts Electronic measurement & instrument Electronic workshop (Printed circuits.	Electrical & ics Drawing.
1.4 Applied Physics, Engineering. Applied Mathema- tics	He must acquire knowledge of system block diagram and working principles of different computer peripherals.	Computer archite- cture, peripher- als & interface.	Digital Ckts & systems.	Applied Electrical
1.5	He must acquire the knowledge of making PCs layouts and learn drafting technique.	Project (He should make layouts of PCB in this project.	Electronic drawing & design; Electronic workshop.	
1.6 Applied Mathema- tics	He must acquire the knowledge of efficient use of system software by writing a small diagnostic programme to test the system.	Communication & Data Transmiss- ion computer architecture microprocessor & application, Communication Data transmiss- ion peripherals & Interfaces, Introduction to		

COURSE OBJECTIVE	CURRICULUM AREA		
Basic Science Subject	Specialised Tech. Area	Core Engg. For Computer Engineering	Basic Engg. Science Subject
	system software data structure.		
1.7 He must acquire the Engineering Applied knowledge of working Mathematics principles of the tics total system, i.e. C.P.U., peripherals, interface and system software.	Peripherals & Interface Introduction to system software computer architecture & microprocessor & its application.	Digital Electronics, Comp- uter test me- asureing equipment	Drawing
2. Skills			
2.1 He must have acquire skill in finding faults in a computer Engineering system. the fault may be at component level or at card level or at subsystem level. After finding fault he must be able to repair it.	Fault diagnosis installation & Maintenance doc- umentation & fa- brication.	Digital Elec- tronics, Ele- ctronic devi- ces & circuits Test & measu- ring equipment	Electronic Drawing, Drawing.
2.2 He must acquire skill Engineering in preparation of site for installation of computer. Engineering	Installation & Maintenance.	Applied Elec- trical Engg. Principles of Electrical Engg.	Drawing, Mechanical Drawing.

COURSE OBJECTIVE	CURRICULUM AREA		
	Specialised Tech. Area	Core Engg. For Computer Engineering	Basic Engg. Science Subject
2.3 He must acquire skill in installing different subsystem power supply, VDU, Printer, Plotter, Graphic monitor, Disc drive etc.	Computer architure installation & maintenance peripherals & interface.	Electronic Devices & Circuits. Digital Electronics.	Engineering Applied Physics Drawing, Workshop Practice
2.4 He must acquire skill in operating and testing the working of different subsystem installed.	Inatallation & Maintenance Computer Architecture peripheral & interfaces.	Electronic Instruments & Measuring & Digital electronics, Electronic devices & circuits.	
2.5 He must acquire skill in making (or designing layouts on printed circuited board for a given electronic circuit.	Project	Electronic workshop, Electronic device & circuits.	

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COURSE OBJECTIVE	CURRICULUM AREA		
Basic Science Subject	Specialised Tech. Area	Core Engg. For Computer Engineering	Basic Engg. Science Subject
2.6 He must acquire skill in fabrication an electronic components (inclucing ICs) on a printed circuit board (Mechanical) according to a given circuit diagram.	Project & Industrial training	Electronic workshop, Electronic devices & circuits, Digital circuit & system, Electr-	Engineering Drawing, Workshop Practice

onic drawing.

2.7 Engineering	He must acquire skill in testing the performance of an electronic circuit fabricated on a printed circuit board.	Project fundamental of digital control	Digital circuits & system, Electronic Device & circuits, Electronic Instrument & measurement, Electronic measurement & Instrument, Electronic drawing, Electric workshop.	Drawing
2.8	He must acquire skill in writing specification of a computer and its subsystem and peripherals. Making use of the quotations he must be able to make a comparative statement.	Computer architecture peripheral & interfaces industrial management		
2.9 Engineering	He must acquire skill in arranging demonstration of a computer system and its peripherals.	Computer architecture Test & measuring equipment Microprocessor & Application. Peripheral & Interface. Industrial training.	Principles of Electrical Engg., Applied Electrical Engg., Electronics Drawing.	Drawing, Workshop Practice
2.10 Engineering	He must acquire skill in preparation of documents (to be used in production, sales, maintenance & installation) with the help and guidance from an engineer.	Documentation Fabrication. Reporting writing. Installation & Maintenance Fault diagnosis peripherial &	Electronic Drawing, Digital Electronics. Electronic Devices & Circuits. Electronic	Drawing, Workshop Practice

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        COURSE OBJECTIVE        |                    CURRICULUM AREA
|
    ------------------------------------------------------------------------
--------------|
                                    Specialised Tech.   Core Engg.      Basic
Basic         |
                                    Area                For Computer    Engg.
Science       |
                                                        Engineering     Science
Subject       |
                                                                        Subject
|
    ------------------------------------------------------------------------
--------------|
                                    interface           Workshop.
                                    project. Computer
                                    organisation    &
                                    programming.
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CHANGES IN THE SYLLABUS:

I YEAR
1.7 COMPONENT OF IT

1.   In topic no 4. "Mobile Computing" is shifted in topic no. 6
     and new matter added as "Tele conferencing".
2.   In Topic no. 6 "CPU and Mathematical Logid" is shifted in II
     Year in Paper No. "2.7 Computer Organisation".

1.8 OPERATING SYSTEM

1.   In Topic No 5 and 7 removed.
2.   In Topic No. 6 "Types of windows and difference" added.
3.   In Lab Experiment No. 1 is Removed.

1.9 FUNDAMENTAL OF ELECTRONICS DEVICE

1.   In Topic no. 2- 2.1, 2.2,2.3 removed
2.   In Topic no. 3- 3.3 removed.
3.   In Topic no. 5- 5.1 and 5.2 shifted to topic no. 4- 4.2
4.   In Topic no. 6 "Feedback amplifier" named as topic 7.
     "Operational Amplifier" added to topic no. 6.
5.   In lab experimental no. 18 added "Use of OP-AMP.....".

II YEAR
2.2 PROGRAMMING IN C & C++
1.   In Topic no. 4 "Generalasation, Specialization" added.

2.3 DATA COMMUNICATION & COMPUTER NETWORK
1.   New paper 2.3 "Data Communication & Computer Network"

introduce in place of "Computer Communication Network".

2.4 OFFICE TOOLS
1. New Paper 2.4 "Office Tools" introduce in place of "MS
    office".

2.5 VISUAL BASIC
1. In topic no. 6 VB.NET is added. and in lab a new experiment
    VB.NET added.

2.7 COMPUTER HARDWARE & MAINTENANCE
1. The above paper redesigned.

III YEAR
3.3 INTERNET AND WEB TECHNOLOGY
1. This paper is redesigned in place of 2 paper named as
    "Internet" and Other as "Web Technology".
*   ASP programme, redesigned HTML and Web Building added.
3.4 CONCEPTS OF RDBMS
1. In topic no. 5 SQL commands introduced.
3.5 JAVA PROGRAMMING
1. The above new paper introduced.

    EQUIPMENT LIST FOR COMPUTER CENTRE, STAFF STRUCTURE & SPACE
    REQUIREMENT

    Equipment list for computer centre revised as per changed
    syllabus and number of equipment, staff structure and space
    requirement revised for the intake of 60 students.

                    YEARWISE DISTRIBUTION

1. I YEAR

 1.1 Professional Communication
 1.2 Applied Mathematics-I
 1.3 Applied Physics
 1.4 Applied Chemistry
 1.5 Electrical Engineering-I
 1.6 Engineering Mechanics & Material
 1.7 Component of Information Technology
 1.8 Operating System
 1.9 Fundamentals of Electronics Devices

     II YEAR

 2.1 Applied Mathematics-II
 2.2 Programming In C & C++
 2.3 Data Communication & Computer Network
 2.4 Office Tools
 2.5 Visual Basic

2.6 Microprocessor & Its Application
2.7 Computer Hardware & Maintenance
2.8 Electronic Instruments & Measurments

   III YEAR

3.1 Industrial Management & Enterprenuership
    Development.
3.2 Data Structure Using C & C++
3.3 Internet & Web Technology
3.4 Concept of RDBMS Using Oracle
3.5 Java Programming
3.6 MIS & System Analysis & Design
3.7 Computer Graphics.
3.8 Environmental Education & Disaster Management
3.9 Project -i. Problem
             ii. Field Exposure
            iii. Seminar

I YEAR

                1.1 PROFESSIONAL COMMUNICATION

   [Common to All Engineering/Non Engineering Courses]
                                            L   T   P
                                            3   -   2
 Rationale:

           Communication forms an important activity of
   diploma holder. It is essential that he/she should be in a
   position   to   communicate in writing and   orally   with
   superiors,equals and subordinates. This   subject aims at
   providing working knowledge of languages like Hindi   and
   English   so as to   train the students in the art   of
   communication. It is suggested that maximum attention should
   be given in developing Communication   abilities   in   the
   students while imparting instructions by giving maximum
   emphasis on practice.

_____
Sr.No.   Units   Coverage time
                                            L   T   P
_____

1.   Introduction to communication methods   5   -   -
         meaning,channels & media written and
         verbal.

2.   Development of comprehension of English 20   -   -
         & Hindi through study of text material&
         language exercises.

3.   Development of expression through
         A. Letters(English & Hindi)   10   -   -

```
             B. Report writing (English)       10    -   -
             Note making and minutes writing

4.           Composition                       10    -   -

5.           Grammer                           20    -   -
----------------------------------------------------------------
                                               75    -   50
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_____

1.   PART I : COMMUNICATION IN ENGLISH

1.1 Concept   of   communication,   importance   of   effective
     communication, types of communucation, formal, informal,
     verbal and nonverbal, spoken and written. Techniques of
     communication, Listening, reading, writting and speaking,
     Barriers in communication, Modern tools of communication-
     Fax, e-mail, Telephone, telegram, etc.

1.2 Development of comprehension and knowledge of   English
     through the study of text material and language exercises
     based on the prescribed text book of English.

1.3 Development of expression through:

     1.3.1 Letters   :
           Kinds of letters:-
           Official, demi-offical, unofficial , for reply or in

           reply, quotation, tender and order giving letters.
           Application for a job.

     1.3.2 Report writing and Note making and minutes writing.

1.4 Grammer : Transformation of sentences, Preposition,
     Articles, Idioms and Phrases, One word substitution,
     Abbreviations.

1.5 Composition on narrative, descriptive, imaginative,
     argumentative, discussion and factual topics.

2.   PART II : COMMUNICATION IN HINDI

2.1 Development of comprehension and knowledge of Hindi usage
    through rapid reading and language exercises based on
    prescribed text material developed by IRDT.

2.2 Development of expression through ;

     Letter writing in Hindi:
     Kinds of letters:-
     Official, demi-offical, unofficial , for reply or in

reply, quotation, tender and order giving letters, Application for a job.

(1) Paper should be in two parts, part I - English and part II Hindi.

COMMUNICATION AND PRESENTATION PRACTICES

1.A. Phonetic transcription
  B. Stress and intonation :
     (At least 10 word for writting and 10 word for pronunciation)

2.   ASSIGNMENT : (Written Communication)

     Two assignment of approximately 400 word each decided by the teachers.

     SUGGESTED ASSIGNMENTS :

     1.   a picture/photograph
     2.   an opening sentence or phrase
     3.   a newspaper/magzine clipping or report
     4.   factual writting which should be informative or argumentative.

3.   Oral Conversation:

1.   Short speeches/declamation : Bid farewell, Felicitate somebody, Celebrate a public event, Offer condolences
2.   Debate on current problems/topics
3.   MockInterview : Preparation, Unfolding of personality and Expressing ideas effectively
4.   Group discussion on current topics/problems
5.   Role Play/ general conversation : Making polite enquiries at Railway Station, Post Office, Banks and other Public places, Replying to such enquiries, enquiring about various goods sold in the market and discussing their prices. Complaining about service at Hotel, restaurant, Offering apologies in reply to such complaints, complain to a company about a defective product you have brought, reply to such complaints.
6.   Presentation skill, Use of OHP and LCD.

4.   Aural :

     Listening to conversation/talk/reading of short passage and then writting down the relevant or main points in the specified number of words and answering the given questions

     The assignments/projct work are to be evaluated by the internal/ external examiner. The distribution of 30 marks

e.g.

10 marks for assignment (Given by subject teacher as sessional marks)
10 marks for conversation and viva-voce
10 marks for phonetic transcription

STRUCTURE OF COMMUNICATION TECHNIQUE PAPER

Distribution of Marks

Theory Paper : 50 Marks
Sessional   : 20 Marks
Pratices   : 30 Marks

Q1. Question based on the topics prescribed text material will
    be set to test the candidates ability to understand the
    content, explain words and phrases, making sentence of given
    words and ability to summarise will be included. All
    questions will have to be answered.

    A.   from English Text Book   10 Marks
    B.   from Hindi Text Book   5 Marks

Q2. Candidates will be required to write one letter (English)
    and one letter in (Hindi) from a choice of two -

    A.   English Letters   5 Marks
    B.   Hindi Letters   5 Marks

Q3. Report Writting on given outlines 5 Marks

Q4. There will be a number of short answer questions to test the
    candidates knowledge of functional grammer, structure and
    usage of the language. All the items in this question will
    be compulsory. The grammar questions has four parts -

    (Total Part: A For 5 Marks, B For 3 Marks, C For 3 Marks and
    D For 4 Marks)

    A.   This part of the question has to do with the
         transformation of sentences. English uses several
         patterns of sentence formation and the same meaning can
         be expressed by several patterns e.g. Active to Passive
         voice and vice versa, Direct to Indirect and vice
         versa, Reframing sentences by changing part of speech
         e.g Noune to Adjective, Interchanging degree of
         comparison.

         Interchanging Moods - Affirmative to Negative,
         Assertive to Interrogative or to exclamatory

B.   The second part usually requires blanks in a sentence
      to be filled in with a suitable preposition and
      articles.

C.   The third part is usually an exercise on tenses.

D.   The fourth part concerns with one word substitution and
      abbrevation, uses of idioms and Phrases.

Q5.   COMPOSITION : (About 300 Words) (5 marks)

      Candidates will be required to select one composition topic
      from a choice of five. The choice will normally include
      narrative descriptive, argumentative,   discussion   and
      factual topics. The main ceteria by which the composition
      will be marked are as follows

A.   the quality of the language employed, the range   and
      appropriateness of vocabulary and sentence structure   the
      correctness of grammatical construction, punctuation   and
      spelling.

B.   The degrees to which candidate have been successfully in
      organising   both the composition as a whole and   the
      individual paragraphs.

1.2 APPLIED MATHEMATICS I

[Common to All Engineering Courses]

                                              L   T   P
                                              3 2/2 -
 Rationale:

      The study of mathematics is an important requirement
for the understanding and development of any branch of
engineering. The purpose of teaching mathematics to diploma
engineering   students is to impart them basic knowledge
of mathematics which is needed for full understanding
and study of engineering subjects.

S.N.	Units	Coverage Time

		L	T	P
1.	Algebra-I	18	6	–
2.	Trigonometry	7	2	–
3.	Coordinate Geometry	15	5	–
4.	Differential Calculus-I	15	5	–
5.	Integral Calculus-I	20	7	–
		75	25	–

DETAILED CONTENTS:

1.   ALGEBRA-I :

1.1   Series : AP and GP; Sum, nth term, Mean

1.2   Binomial theorem for positive, negative and fractional index
      (without proof). Application of Binomial theorem.

1.3   Determinants : Elementary properties of determinant of order
      2 and 3, Multiplication system of algebraic equation,
      Consistency of equation, Crammer's rule

1.4   Vector algebra : Dot and Cross product, Scaler and vector
      triple product. Application to work done, Moment of a force,
      Plane geometry.

2.   TRIGONOMETRY :

2.1   Relation between sides and angles of a triangle : Statement
      of various formulae showing relation ship between sides and
      angle of a triangle.

2.2   Complex number.

      Complex numbers, Representation, Modulus and amplitud
      Demoivre theorem, its application in solving algebraic
      equations, Mod. function and its properties..

3.   CO-ORDINATE GEOMETRY :

3.1   Standard form of curves and their simple properties –

      Parabola $x^2=4ay$, $y^2=4ax$,

      Ellipse $\dfrac{x^2}{a^2} + \dfrac{y^2}{b^2}=1$

      Hyperbola x^2 y^2

$$\frac{}{a2} + \frac{}{b2} = 1$$

Tangent and normals

3.2 Straight lines, planes and spheres in space -

Distance between two points in space, direction crossing and direction ratios, Finding equation of a straight line, and shortest distance between two lines

Under different conditions equation of a plane lx+my+nz=c, relation between lines and planes, sphere x2 + y2 + z2 + 2gx + 2fy + 2wz=d

4.   DIFFERENTIAL CALCULUS - I :

4.1 Functions, limits, continuity, - functions and their graphs, range and domain, elementary methods of finding limits (right and left), elementary test for continuity and differentiability.

4.2 Methods of finding derivative, - Function of a function, Logaritimic differentiation, Differentiation of implicit functions, Higher order derivatives, Leibnitz theorem.

4.3 Special functions (Exponential, Logarithmic, Hyperbolic, Inverse circular and function), Definition, Graphs, range and Domain and Derivations of each of these functions.

4.4 Application - Finding Tangants, Normal, Points of Maxima/Minima, Increasing/Decreasing functions, sketching of some simple curves (without assumptions, question, not to be asked in the examination), Rate, Measure, velocity, Acceleration, Errors and approximation.

5.   INTEGRAL CALCULUS - I :

5.1 Methods of Indefinite Integration :- Integration by substitution, Partial fraction and by parts, Integration of special function of 4.3.

5.2 Meaning and properties of definite integrals, Evaluation of definite integrals.

5.3 Application : Finding areas bounded by simple curves, Length of simple curves, Volume of solids of revolution, centre of mean of plane areas.

5.4 Simpsons and Trapezoidal Rule : their application in simple cases, Concept of error for simple function.

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                    1.3 APPLIED PHYSICS

             [ Common  to  All Engineering Courses]

                                         L   T   P
                                         3  2/2  2
Rationale:

        Engineering  physics  is  a  foundation  Course.  Its
     purpose  is  to  develop proper  understanding  of  physical
     phenomenon  and  scientific temper  in  the  students.  While
     teaching  the  subject,teachers should make maximum  use  of
     demonstrations  to  make  the  subject  interesting  to  the
     students.

            TOPIC WISE DISTRIBUTION OF PERIODS
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Sl.No.		Topics	L	T	P
1.		Measurement	4	1	-
2.		Vector	3	1	-
3.		Force and Motion	4	1	-
4.		Dynamics of rigid body (Rotational Motion)	4	1	-
5.		Fluid Mechanics and Friction	4	1	-
6.		Work,Power and Energy	4	2	-
7.		Elasticity	2	1	-
8.		Simple Harmonic Motion	4	1	-
9.		Heat Transfer & Radiation	4	2	-
10.		Application of Sound Waves,Acoustics and Ultrasonics	6	2	-
11.	A.	Optics	4	1	-
	B.	Fiber Optics	4	1	-
12.		D.C. Circuits	4	1	-
13.		Dielectrics	4	2	-
14.		Magnetic Fields and Materials	4	2	-
15.		Semi Conductor Physics	5	1	-
16.		Nuclear Physics	4	2	-
17.		Laser & its Application	4	1	-
18.		Non-conventional energy sources	3	1	-
			75	25	50

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                     DETAILED CONTENTS:

1. Measurement
   a) Units and Dimensions

    Fundamental and derived units :

    S.I. Units & Dimensions of physical quantities,  Dimensional
    formula and dimensional equation. Principle of homogenity of
    dimensions and applications of homogenity principle to:

       i) Checking the correctness of physical equations,
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ii) Deriving relations among various physical quantities,

iii) Conversion of numerical values of physical quantities from one system of units into another. Limitations of

dimensional analysis.

b. Errors in measuremnts, accuracy and precision, random and systematic errors, estimation of probable errors in the results of measurement(Combination of erros in addition, substraction, multipication and powers). Significant figures, and order of accuracy in resprect to instruments, Standard deviation, Variance.

2. Vector :

Scalar and vector quantities; Addition, Subtraction, Resolution of vector- Cartesian components of vector, Scalar and vector product of two vector.

3. Force and Motion

Parabolic motion, projectiles thrown horizontally and at an angle. Problems on time of flight, horizontal range, and maximum horizontal range. Central forces. Circular motion, angular velocity,angular acceleration and centripetal acceleration.Relationship between linear and angular velocity and acceleration. Centripetal and centrifugal forces. Practical applications of centripetal forces. Principle of centrifuge. Gravitational force, Motion of satellites, Kepler's laws, Escape velocity, Geo-stationary satellite, Concept of Black holes, Jet propulsion theory, Motion of Multi-stage Rocket, SLV, PSLV and GSLV Rockets.

4. Dynamics of Rigid Body (Rotational Motion)

Rigid body,Rotational motion, Moment of inertia,Theorems(Perpendicular and Parallel axis) of moment of inertia (Statement). Expression of M.I. of regular bodies, Radius of gyration, angular momentum, Conservation of angular momentum, Torque, Rotational kinetic energy. Rolling down the slant planes.

5. Fluid Mechanics & Friction

Surface tension, Capillaries, Equation of continuity (A1V1=A2V2), Bernoulli's theorem, stream line and Turbulent flow, Reynold's number.

Introduction, Physical significance of friction, Advantage

and disadvantage of friction and its role in every day life. Static and dynamic frictional forces. Coeffi- cients of static and dynamic friction and their measurements. viscosity, coeff. of viscosity, & its determination by stoke's method.

6.   Work, Power and Energy

Work done by force on bodies moving on horizontal and inclined planes in the presence of frictional forces,Concept of power and its units. Calculation of power (simple cases). Concept of kinetic and potential energy, various forms of energy, Conservation of energy. Force constant of spring, potential energy of a stretched spring.

7.   Elasticity

Elasticity, stress and strain. Hooke's law, elastic limit.Yielding point and breaking point. Modulus of elasticity Young's modulus, bulk modulus and modulus of rigidity, Poisson ratio, Resilience.

8.   Simple Harmonic Motion

Periodic Motion , characterstics of simple harmonic motion; equation of S.H.M. and determination of velocity and acceleration. Graphical representation. Spring-mass system. Simple pendulum. Derivation of their periodic time. Energy conservation in S.H.M. Definition of free, forced, undamped and damped vibrations, Resonance and its sharpness, Q-factor.

9.   Heat Transfer and Radiation

Modes of heat transfer , coefficient of thermal conductivity and its determination by (i) Searle's method for good conductors, and (ii) Lee's method for poor conductors. Conduction of heat through compound media, Conduction and convection, Radial flow of heat, Blackbody radiation, stefan's law, Wein's displacement and raleigh-Jeans laws, Planck's Law.

10. Application of Sound Waves

Acoustics

Standing waves, Closed and Open organ pipes, Resonance, End-correction.Definition of pitch, loudness, quality and intensity of sound waves. Echo and reverberation and reverberation time. Sabine's formula. Control of reverberation time (problems on reverberation time).

Accoustics of building defects and remedy.

Ultra-Sonic :

Generation, Magnetostriction, Piezoelectric effect, Application in new technology

11.A Optics

Quantum nature of light, Coherrence (Spatial and temporal), Duality of wave and particle, Concept of Interference, Biprism, Fraunhoffer single and N-slit diffraction, Grating, Resolving and dispersive power, Elementary concept of polarisation.

  B. Fibre Optics :

Critical angle, Total internal reflection, Principle of fibre optics, Optical fibre, Pulse dispersion in step-index fibres, Graded index fibre, Single mode fibre, Optical sensor.

12. D.C. Circuits

Principle of Wheat Stone bridge and application of this principle in measurement of resistance (Meter bridge and Post Office Box); potentiometer, Kirchoff's Law and their simple application. Principle of Carey-Foster's bridge. Electric potential, potential energy, Energy of a changed capacitor. fleming left hand rule, torque on a current loop, Moving coil, Galvano meter. Charging/discharging of capacitors, Ballistic galvonometer, its charge sensitivity and Current sensitivity.

13. Dielectrics :

Electric dipole; effect of electric field on dielectrics, polarisation.

14. Magnetic Fields & Materials :

Dia, Para and Ferro-magnetism, Ferrites, Hysteresis, Methods of plotting, Hysteresis curve of a ferro magentic materials and their uses, Magnetic circuits, Energy stored in magnetic fields, Basic idea of super conductivity, Meissner's effect, Applications.

15.Semiconductor Physics

Energy bands in soldis, classification of solids into conductors, insulators and semiconductors on the basis of

energy band structure. Intrinsic and extrinsic semi conductors, Electrons and holes as charge carriers in semiconductors, Effect of temperature in conduction in semiconductors, P-type and N-type semiconductors, P-N junction formation, barrier voltage, Forward and reverse biasing of a junction diode, P-N junction device characteristics, Formation of transistor, transistor-action, Majority and Minority charge carriers, Base, emitter and collector currents and their relationship LED's, Photo-electric effect and photo devices.

16. Nuclear physics

Radioactivity, Nuclear stability, Radioactive emmission, radiation damage, Nuclear fission and fusion, Nuclear reactors (PHWR-type and fast breeder) and their application, Mass-energy relation, Automatic mass unit, Mass defect and binding energy.

17. Lasers and its Applications

Absorbtion and Emission of energy by atom, Spontaneous and Stimulated Emission, Einstein's co-efficients, Poluation inversion, Main component of laser and types of laser- Ruby Laser, He-Ne and Semi-conductor laser and their applications. Principles of Holography, Introduction to MASER.

18. Non-conventional energy sources:

(a)   Wind energy : Introduction, scope and significance, measurement of wind velocty by anemometer, general principle of wind mill, Indian wind energy programme.

(b)   Solar energy: Solar radiation and potentiality of solar radiation in India, unit of solar radiation, Solar constant measurement of solar radiation by pyrometer, and by Insolation meter (suryamapi) uses of solar energy: Solar Cooker, solar water heater, solar photovoltaic cells, solar energy collector, Solar PV plants in India, Modern applications in technology.

PHYSICS LAB

Note: Any ten experiments are to be performed.

1. Determination of coefficient of friction on a horizontal plane.

2. Determination of 'Y' (Young's Modulus) by Searle's Method.

3. Determination of 'g' by plotting a graph T2 verses l and using the formula g=4n2/Slope of the graph line

4. Determination of Spring constant.

5. Determination of viscosity coefficient of a lubricant by Stoke's law.

6. Determination of 'k' for good conductor (Searle's Method).

7. Determination of frequency of AC mains by melde's methods (Transverse and Longitudinal Mode)

8. Determination of velocity of sound by resonance tube.

9. Determination of E1/E2 by potentio meter.

10. Determination of specific resistance by Carry Foster bridge.

11. Determination of resitivity by P.O.Box.

12. Verification of Kirchoff's Law.

13. To observe Characteristics of p-n Junction diode on oscillscope.

14. To measure instantaneous and average wind velocity by indicating cup type anemometer/hand held anemometer.

15. To measure solar intensity (determine solar constant) with the help of Insolation meter (Suryamapi).

16. Demonstration of He-Ne laser (Interferometer)

17. Determination of internal resistance by potentiometer.

    NOTE :

    Students should be asked to plot a graph in experiments (where possible) and graph should be used for calculation of results. Results should be given in significant figures only.

1.4 APPLIED CHEMISTRY

[Common to All Engineering Courses]

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                                         L  T  P
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Rationale:

Engineering Chemistry has profound and deep
relationship with the industrial and environmental
technology. This curriculum intends to impart technical
knowledge alongwith productive practice to the students of
the diploma engineering. The teachers are expected to guide
the students in the classroom and the laboratories according
to the curriculum by demonstrations and by showing relevant
materials and equipments to inculcate interests in learning
among students.

TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Topics	L	T	P
1.	Atomic Structure	4	-	-
2	Chemical Bonding	6	-	-
3.	Classification of Elements	3	-	-
4.	Instrumental Methods	4	-	-
5.	Electro Chemistry	6	-	-
6.	Chemical Kinetics	4	-	-
7.	Catalysis	3	-	-
8.	Solid State	3	-	-
9.	Colloids	3	-	-
10.	Lubricants	3	-	-
11.	Environmental Pollution and Control	3	-	-
12.	Water Treatment	5	-	-
13.	Corrosion	3	-	-
14.	Fuels	3	-	-
15.	Glass and Ceramics	3	-	-
16.	Streochemistry of Organic Compounds	4	-	-
17.	Organic Reactions	6	-	-
18.	Organic Materials	9	-	-
		75	-	-

DETAILED CONTENTS:

1.   ATOMIC STRUCTURE :

Basic concept of atomic structure, Matter wave concept,
Schrodinger wave equation, Quantum number, Haisenberg's
Uncertainty Principle, Shaples of orbitals.

2.   CHEMICAL BONDING :

Overview of basic concept, Hydrogen bonding, Valence bond
theory, Hybridisation, VSEPR theory, Molecular   orbital

theory, Co-ordination bond, Crystal field theory for tetrahedral carbon.

3.   CLASSIFICATION OF ELEMENTS :

Modern classification of elements (s,p,d and f blcok elements), Periodic properties : Ionisation potential electro negativity, Electron affinity, Born-Haber cycle.

4.   INSTRUMENTAL METHODS :

UV-visible, IR and NMR spectroscopy, Basic principles, Beer-Lamberts Law and Application of spectroscopy.

5.   ELECTRO CHEMISTRY :

Arrhenius Theory of electrolytic dissociation, Transport number, Electrolytic conductance, Ostwald dilution law. Concept of Acid and bases : Bronsted, Arrhenius and Lewis theory. Concept of pH and it measurement by pH meter. Buffer solutions, Indicators, Solubility product, Common ion effect with their application, Redox reactions, Electrode potential(Nernst Equation), Electro-chemical cell (Galvanic and Electrolytic). EMF of a cell and free energy change. Standard electrode potential, Electro chemical series and its application.

Concentration cells, reference electrodes (Hydrogen electrode) cells - Primary, Secondary and Fuel cell, Laclanche's or dry cell, Acid storage cell (Lead accumulator) and Alkali stroge cell (Edison accumulator), Fuel cell, Solar cell (Photovoltaic cell), Numerical problems based on topics.

6.   CHEMICAL KINETICS :

Introduction, order and molecularity of rection. Activation energy, Rate loss, rate constants, Ist order reactions and 2nd order reactions.

7.   CATALYSIS :

Definition Characteristics of catalytic reactions, Catalytic promotors and poison , Autocatalysis and Negative catalysis, Actvation energy, Theory of catalysis, Application

8.   SOLID STATE :

Types of solids (Amorphous and Crystalline), Classification

(Molecular, Ionic, Covalent, Metallic), Band theory of solids (Conductors, Semiconductors and Insulators), types of Crystals, FCC, BCC, Crystal imperfection.

9.   COLLOIDAL STATE OF MATTER :

Concept of collidal and its types, Different system of colloids, Dispersed phase and dispersion medium.
Methods of preparation of colloidal solutions, Dialysis and electrodialysis. Properties of colloidal solution with special reference to absorption, Brownian Movement, tyndal effect, Electro phoresis and coagulation. relative stability of hydrophillic and hydrophobie colloids. Protection and protective colloids. Emulsion, Types, preparation,properties

and uses. Application of colloids chemistry in different industries.

10.   LUBRICANTS :

Definition, classification, Necessasity and various kinds of lubricants. Function and mechanism of action of lubricants and examples. Properties of lubricants, Importance of additive compunds in lubricants, Synthetic lubricants and cutting fluids. Industrial application, its function in bearing.

11.   ENVIRONMENTAL POLLUTION AND ITS CONTROL :

Concept and various types of environmental pollution with special reference to air pollution and water pollution. General measures to control environmental pollution. depletion of Ozone layer, Green house effect, Acid rain, Smog formation, Chemical and photochemical reaction, Various species in atmosphere. Specific industrial pollution like Euro-I and Euro-II.

12.   WATER TREATMENT :

Concept of hard and soft water, Hardness of water, Its limits and determination of hardness of water by EDTA method. Softening methods (Only Sods lime, Zeolote and Ion exchange resin process). Disadvantage of hard water in different industries, Boiler feed water boiler scale formation, Corrosion, Caustic embritlement, primming and foarming.

Characteristics imparted by various impurities or contaminants such as colour, odour, taste and sediments and their analysis.

Analysis of Water :

A.   Estimation of chlorides in water.
B.   Determination of dissolved oxygen.

Disinfecting of Water :

By Chloramic, Ozone and Chlorination with its mechemism, Advantage and disadvantage of chlorinational, Break point chlorination (Free residual chlorination). Industrial waste and sewage, Municipality waste water treatment, Definition of BOD and COD. Recycling of water-Theory and Process. Numerical problems based on topics.

13. CORROSION :

Concept of metallic corrosion, Types of corrosion and factors affecting the corrosion rate, Chemical and electrochemical theory of corrosion, Oxide film formation and its characteristics, tarnishing fogging and rusting, Prevention of corrosion by various methods.

14. FUELS :

Definition   of   fuel,   its   classification   and   their

composition, Calorific value and determination of calorific value of solid and liquid fuels by Bomb calorimeter by Dulong's formula.

Liquid fuel - Petroleum and its refining, distillate of petroleum (Kerosene oil, Disel and Petrol), Benzol and Power alchol.

Knocking, Anti-knocking agents, Octane number and Cetane number.

Cracking and its type, Gasoling from hydrogenation of coal (Bergius process and Fischer tropsch's process)

Gaseous Fuel - Coal gas, Oil gas, Water gas, Producer gas, Bio gas, LPG, CNG and Solar energy

Numerical Problems based on topics

15. GLASS AND CERAMICS :

Concept of glass and its constitutents, Classification and uses of different glass, Elementary idea of manufacturing process of glass.Introduction to ceramics materials, Its constituent. Industrial application of glass and ceramic.

16. STEREOCHEMISTRY OF ORGANIC COMPOUND:

-       Isomerism

-       Types of isomerism

        1.   Structural isomerism
        2.   Steroisomerism (a) Geometrical (b) Optical

-       Definition of chiral, achiral stereogenic centre, plane of
        symmetry.

-       Types of steroisomers-

        1.   Conformers or Rotamers (Only ethanes)
        2.   Configurational isomers
                a.   Enantiomers
                b.   Diastereoisomers

17.   ORGANIC REACTIONS :

1.   Fundamental auspects -

        A.   Regents electrophiles and nucleophiles
        B.   Reaction Intermediates
                i.   Free radical
                ii.   Carbocation
                iii.   Carbanion
        C.   Various effects of substituents - Inductive, Mesomeric,
                Electromeric.

2.A.   Mechanism   of   addition reaction   (Markonicove's   Rule,
        Cyanohydrin and Peroxide effect),

B.   Mechanism   of   Substitution   reactions   (Nucleophillic-
        hydrolysis of alkyle halide, electrophillic substitution
        halogenation, Sulphonation, Niration and friedel-Craft
        reaction.

C.   Mechanism of Elimination reaction - Dehydration of primary
        alcohol, Dehyrohalogenation of primary alkyl halide.

18.   ORGANIC MATERIALS :

A.   POLYMERS :

1.   Introduction to basic terms used in polymer chemistry and
        technology. Monomers, Average degree of polymerisation,
        Average molecular weight,Polymers, Polymerisation.

2.   Characteristics of Polymers and their classification

A. Addition polymers and their industrial application-
    Polystyrene, PVA, PVC, PAN, PMMA, Buna-S, Buna-N,
    Teflon.

B. Condensation polymer and their industrial application :
    Nylon 6, Nylon 6,6, Bakelite, Melamine formaldehyde,
    Urea formaldehyde, Terylene or Decron, Polyurethanes.

3. Free radical polymerisation (Mechanism)

4. General idea of Bio polymers

5. Brief idea of bio degradable polymers.

6. Inorganic polymers - Silicones

B. SOAPS AND DETERGENTS :

1. Introduction - A. Lipids, B. Fats and Oils
2. Saponification of fats and oils , Manufacturing of soap.
3. Synthetic detergents, types of detergents and its
    manufacturing.
C. EXPLOSIVES: TNT, RDX, Dynamite.
E. Paint and Varnish
F. Adhesives

1.5 ELECTRICAL ENGINEERING-I

(Common With Diploma In Electronics Engineering, Instrumentation
Engineering and Computer Science & Engineering)

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                                            3   -   2
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RATIONALE

    Electrical energy is most convinient neat and clean
source of energy for industrial applications. The student is
supposed to posses basic knowledge of electrical engineering
materials such as conducting, non conducting, insulating,
magnetic, semi conductor and some special purpose materials.
Fundamental knowledge of electrostatics, electromagnetism
will be helpful in understanding the performance of D.C. and
A.C. circuits. To face the routine problems of world of work
chapters on batteries, transients and harmonics have also
been added.

        TOPIC WISE DISTRIBUTION OF PERIODS

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Sr. No.   Units   Coverage Time

		L	T	P
1.	Classification	3	–	–
2.	Conducting Materials	8	–	–
3.	Insulating Materials	8	–	–
4.	Magnetic Materials	6	–	–
5.	Semi Conductor & Special Purpose Materials	6	–	–
6.	D. C. Circuits	6	–	–
7.	Electrostatics	8	–	–
8.	Electromagnetism	8	–	–
9.	A. C. Theory	8	–	–
10.	Batteries	6	–	–
11.	Transients & Harmonics	8	–	–
	Total	75	–	50

DETAILED CONTENTS

1. CLASSIFICATION:

    Classification of materials into Conducting materials, Insulating materials, Semi-conducting materials with reference to their atomic structure.

1.1 Conducting Materials:

    A. Resistivity and factors affecting resistivity such as temperature, alloying and mechanical stressing.

    B. Classification of conducting materials into low resistivity and high resistivity materials. Some examples of each and their typical applications.

1.2 Insulating Materials:

    A. Electrical Properties:

        Volume resistivity, Sarface resistance, Dielectric loss, Dielectric strength (Break down valtage) and Dieclectric constant.

    B. Chemical Properties:

        Solubility, Chemical resistance, Weather ability.

    C. Physical Properties:

Hygroscopicity, tensile and Compressive strength, Abrassive resistance, Brittleness.

D.   Thermal Properties:

Heat resistance, classification according to permissible temperature rise, Effect of electrical overloading on the life of an electrical appliance.

E.   Plastic Insulating Materials:

Classification into thermoplastic and thermosetting catagories, examples of each and their typical applications.

1.3   MAGNETIC MATERIALS:

A.   Ferromagnetism, domains, permeability, hysterisis loop- (including coerrecive force and residual magnetism) and magnetic saturation.

B.   Soft and Hard magnetic materials, their examples and typical applications.

1.4   SEMI CONDUCTOR AND SPECIAL PURPOSE MATERIALS:

N-type and P-type materials, application of semi-conductor materials, materials used in transistor and I.C. manufacture.

1.5   D.C. CIRCUITS:

(i)   Ohm's law, resistivity, effect of temperature on resistances, heating effect of electric current, conversion of mechanical units into electircal units.

(ii) Kirchoff's laws, application of Kirchoff's laws to solve, simple d.c. circuits.

(iii) Thevenins theorem, maximum power trasfer theorem, Norton's theorem and super position theorem, simple numerical problems.

1.6   ELECTROSTATICS:

(i)   Capacitance and capacitor, definition, various types.

(ii) Charging and discharging of a capacitor, growth and decay of current in a capacitive circuit.

(iii) Energy stored in a capacitor.

(iv) Capacitance in terms of dimensions of parallel plate capacitor.

(v) Dielectric constant of material, Break down voltage of a capacitor.

(vi) Series and parallel connection of capacitors.

1.7 ELECTRO MAGNETISM:

(i) Concept of mmf, flux, reluctance and permeability.

(ii) Energy stored in a magnetic field and an inductor.

(iii) Solution of problems on magnetic circuits.

(iv) Faraday's laws of electromagnetic induction, Lenz's law, Physical explanation of self and mutual inductance.

(v) B-H curve, Hysterisis, Eddy currents elementary ideas and significance.

(vi) Growth and decay of current in an inductive circuit.

(vii) Force between two parallel current carrying conductors and its significance.

(viii) Current carrying conductor in a magnetic field and its significance.

1.8 A.C. THEORY:

(i) Concept of alternating voltage and current, difference between A.C and D.C..

(ii) Generation of alternating voltage, equation of sinusoidal waveform.

(iii)Definition and concept of cycle, frequency, Time period, amplitude, instantaneous value, average value, RMS value, peak value, form factor, Peak factor.

(iv) Phase and phase difference, representation of alternating quantities by phasor, addition and subtraction of alternating quantities.

2.1 BATTERIES:

(i) Construction of lead acid and nickel cadmium batteries.

(ii) Charging and maintenance of batteries.

(iii) Rating of batteries.

(iv) Back up batteries (Lithium & Silver Oxide batteries)

(v) Shelf life of batteries.

2.2 TRANSIENTS & HARMONICS:

Introduction, Types of trasients, Important differential
equations, First and Second order equations, Transients in
R-L series circuits (D.C.), Short circuit current, Time
constant, Transients in R-L series circuits (A.C.),
Transients in R-C series circuits (D.C.), Transients in R-C
series circuits (A.C), Double energy transients.

Fundamental wave and harmonics, Different complex waveforms,
Gemeral equation of complex wave, R.M.S. value of a complex
wave, Power supplied by complex wave, Harmonics in single
phase a.c. circuits, Selective resonance due to harmonics,
Effect of harmonics on measurement of inductance and
capacitance

ELECTRICAL ENGINEERING LAB:

LIST OF PRACTICALS:

1. Ohm's law verification.

2. To verify the laws of series and parallel connections of
    resistances i.e. to verify:-

    (i)   The total resistance in series connections.

          RT=R1+R2+R3.......

        Where RT is the total resistance and R1,R2,R3 etc.are
        the resistances connected in series.

    (ii) The total resistance in parallel connections.

          1/RT=1/R1 + 1/R2 + 1/R3......

        Where RT is the total resistance and R1,R2,R3 etc. are
        the resistances connected in parallel. Also to conclude
        that the total resistance value of a parallel circuit
        is less than the any individual resistance.

3. To verify Kirchoff's following laws:-

    (i) The algebric sum of the currents at a junction is zero.

(ii) The algebric sum of the e.m.f. in any closed circuit is
     equal   to the algebric sum of IR products (drops)
     in that circuit.

4. To measure the resistance of an ammeter and a voltmeter and
    to conclude that ammeter has very low resistance whereas
    voltmeter has very high resistance.

5. To verify Thevenin's and maximum power transfer theorems.

6. To find the ratio of inductance values of a coil having air
    core and iron core respectively and thus see that by the
    introduction of a magnetic material inside the coil,the
    inductance value of the coil is substantially increased.

7. To verify the relation:-

        CT=(C1*C2)/(C1+C2)
                  and
        CT=C1+C2

    For   two capacitors,connected in series   and   parallel
    respectively.

8. To test a battery for charged and discharged conditions and
    to make connections for its charging.

9. To show that the range of an ammeter (d.c. and a.c.) and a
    voltmeter (d.c. and a.c.) can be extended with the use of
    shunts and multiplier.
10. To convert the given galvanometer into a voltmeter and an
    ammeter.

1.6 ENGINEERING MECHANICS AND MATERIALS

(Common With Electronics Engg & Instrumentation & Control Engg. &
Computer Science & Engineering)

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RATIONALE

TOPIC WISE DISTRIBUTION OF PERIODS

SL.No.	Topic	L	T	P

1.	Introduction	5	-
2.	Force Analysis	12	-
3.	General condition of equilibrium	12	-
4.	Stress & Strain	12	-
5.	Beam & Trusses	12	-
6.	Materials & Concepts Use In Electronics	22	-
	Total	75	- -

DETAILED CONTENTS

1.   Introduction:

Mechanics and its utility. Concept of scaler and vector quantities. Effect of a force. Tension & compression. Rigid body. Principle of physical independence of force. Principle of transmissibility of a force.

2.   Forces Analysis:

Concept of coplaner and non-coplaner forces including parallel forces. Concurrent and non-concurrent forces. Resultant force. Equilibrium of forces. Law of parallelogram of forces. Law of triangle of forces and its converse. Law of polygon of forces. Solution of simple engineering problems by analytical and graphical methods such as simple wall crane, jib crane and other structures. Determination of resultant of any number of forces in one plane acting upon a praticle,conditions of equilibrium of coplaner concurrent force system.

3.   General Condition of Equilibrium:

General condition of equilibrium of a rigid body under the action of coplaner forces, statement of force law of equilibrium, moment law of equilibrium, application of above on body.

4.   Stresses and strains:

Concept of stress and strain. Concept of various types of stresses and strains . Definitions of tension, compression shear, bending, torsion. Concept of volumetric and lateral strains, Poisson's ratio. Mechanical properties of MS, SS, CI Al and etc.

5.   Beams & Trusses:

Definition of statically determinate and indeterminate trusses. Types of supports. Concept of tie & strut, calculation of reaction at the support of cantilever and simply supported beams and trusses. (simple problems only)

6.A. MATERIALS & CONCEPT USED IN ELECTRONICS :

Soldering materials - Type, chemical composition and properties, Soldering alloys - Tin lead, Tin antimony, Tin silver, Lead silver, Tin zinc, Different types of flux and their properties, Properties of plastics materials, Epoxy materials for PCB (Single and multi layer board), Emulsion parameters, Film emulsion, Type of laminates (Phenolic, Epoxy, Polyster, Silicon, Melamine, Polymide), Properties of copper clad laminates, Material (Filler, Resin, Copper Foil) Photo printing basic for double side PCB, Photo resin materials coating process materials, Screen printing and its materials Etching agent, Film processing and used materials.

(B) Soldering & Brazing:

For black Galvanised and Tincoated Iron sheet, brass and copper sheets only.

(1) Its concept, comparison with welding as joining method and classification, electric soldering and forge soldering.

(2) Soldering operation- edge preparation of joints, Pickling and degreasing, Fluxing, Tinning and Soldering. Wave soldering, solder mask, Dip soldering, Drag soldering,

(3) Materials Used-Common fluxes, soft and hard solder, solder wire (Plain and Resin core) and sticks, spelters and their specifications and discription (For Identification Only), forge soldering bits.

(4) Electric soldering iron, other soldering tools.

(5) Common defects likely to occurs during and after soldering.

(6) Safety of Personnel, Equipment & Tools to be observed.

1.7 Components of Information Technology

(Common to Computer Science & Engineering, Post Graduate Diploma in Computer Application).

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                                          L    T    P
                                          4    2    -
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Rationale

Computers have become an integral part of modern industrial atmosphere. Every technician is supposed to be aware of the application of computers. A student having knowledge of popular software and computer peripherals will prove useful to accept any challenge in day today working.

TOPIC WISE DISTRIBUTION OF PERIODS

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                                          L    T    P
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Sl.No.	Units	Coverage Time		
		L	T	P
1.	Introduction of Information Technology	20	10	-
2.	Component of Information technology	15	6	-
3.	Data Representation	20	10	-
4.	Emerging Trends	15	10	-
5.	Components of Computers	15	6	-
6.	Mobile Computing	15	8	-
		100	50	-

1.   Intoduction of Information Technology

Definition Of Information, difference betwwen data and information,need for information, qualities of information,value of information, categories of information,level of Information. Use of Information Technology in Office Automation,   Computers & Its Types.

2.   Components of Information Technology:

Components Hardware & its Functioning - Input Unit, Control Processing Unit, Output Unit, Types of Input Units & Output Units Computer Software - Types of Software, System Software, Application Software.

3.   Data Resentation :

Binary Number System, Conversion from Decimal to Binary, Conversion   from   Binary to Decimal, Hexadecimal   and Octadecimal No. System, Memory Addressing and its Importantance, ASCII and EBCDIC coding System.

4.   Emerging Trends in Information Technology -

Concepts of Networking and Local Area Networking, Advanced Input/Output Devices and their use(MICR,OCR,Scanners, Light

pen,Plotters, Microfilms, Rewritable, CD-ROMS ,Multimedia,

Video Conferencing, Tele Comferencing .

5.   Components of computer

Types of PC e.g. Desktops, Labtops, Notebooks, Palmtops,
Memory System of a PC, Primary Memory,RAM(Ramdom Access
Memory, ROM(read only Memory), Secondary Memory, Types of
Secondary Storage, Acces Mechanism of storage Devices, PC
setup and ROM-BIOS, Elemantary Trouble shooting.

6.   MOBILE COMPUTING :

Introduction, Personnel Communication Services (PCS), Gobal
System Mobile Communication (GSM), GPRS, Mobile Data
Communication, WAP, 3G Mobile service.

1.8 OPERATING SYSTEM

(Common to Computer Science & Engineering)

	L	T	P
	4	_	4

Rationale :

For effective use of computer, the knowledge about computer
operating system,Windows,DOS,UNIX.C.P.U. share prove useful
for a technician working in a computer centre.

TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Units	Coverage Time L	T	P
1.	Introduction	10	-	-
2.	File System	15	-	-
3.	C.P.U. & Disk,Drum scheduling	25	-	-
4.	Memory Management	25	-	-
5.	Features WINDOWS	25	-	-
		100	-	100

DETAILED CONTENTS

1.   Introduction

What is O.S.,Multiprogramming,Time Sharing,Real Time
System,Multitasking.

2.   File System

File concepts,Access methods,Allocation methods,Directory
System.

3.   C.P.U.& Disk,Drum Scheduling.

Scheduling concepts,Scheduling Algorithm,Multiprocessor,FCFS
Schedulin,Shortest Seek-time first,Scan.

4.   Memory Management

Swapping,Multiple partitions,Paging,Segmentation,Demand
paging,page replacement.

5. Features of Windows

Types of Window & differences, GUI,What is
interface,Windowing,windows environment,menus of   Dialog
boxes,   Concepts   of   Icon,   Functions   of
Programms,Documents,Setting,Run Commond.

                    List Of Practicals

1.   Excercise on Widows 98/2000/VISTA.

          1.9 FUNDAMENTALS OF ELECTRONICS DEVICES.
          (Common With Computer Science & Engineering)

   Rationale:

Knowledge of Electronics Devices is quit essential for a
students of diploma Computer Engineering. The knowledge of
concepts , constructions & working of these devices, will
help students in understanding the working and behaviour of
different hardware constituents of computer.

                                      L   T   P
                                      3 2/2 4

          TOPIC WISE DISTRIBUTION OF PERIODS
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Sr. No.   Units   Coverage Time
                                       L   T   P
_____
1.   Introduction   3   1   -

2.	Semiconductor Physics	8	3	-
3.	Semiconductor Diodes	8	3	-
4.	Transistor	8	2	-
5.	Transistor as an amplifier	12	5	-
6.	Concepts of Feedback	8	3	-
7.	Transistor as a Switch	8	2	-
8.	Multivibrators	6	2	-
9.	Multivibrators as a Memory Elements	6	2	-
10.	Integrated Circuits	8	2	-
	Total	75	25	100

1.   INTRODUCTION:

1.1   Application of electronics in different fields.

1.2   Electronic devices in computer system. e.g. power supply,
      micro processor and other ICs, amplifiers, clock & other
      signal generators.

1.3   Advancements in electronics technology and its impact on
      computers size reduction, capacity expansion, increase in
      reliability, cost reduction)

2.   SEMICONDUCTOR PHYSICS:

2.1   Analyzing conductivity of elements, Types of conductors.

2.2   Pure(Intrinsic) semiconductors-Silicon,   Germenium:Thermal
      Generation(formation of charge carrier-Positive & Negative
      charge carriers i.e. electron-hole pair), Recombination,
      Displacement of hole, mobility of free electron and moving
      hole, effect of variation in temperature, behavior of
      instrinsic semiconductors at 0 K.

2.3   Doping   the   Intrinsic semiconductors with   a   pentra-
      valent/tri-valent element(i.e. doner and accepter   type
      impurity) in small amount, effect of doping on strength of
      charge carrirs(formation of immobile ions and majority and

      minority carriers), P,N Junction.

2.4   Effect of doping a crystal parity 'P' type and parity:
      concepts of diffusion & drift, formation of deplition
      layer(potential barrier)i.e. formation of P-N Junction.

3.   SEMICONDUCTORS DIODES:

3.1   Effect of applying electrical potential across a   P-N
      Junction in the following ways:

(a) Positive of the source to 'P' type terminal & Negative to the 'N' type terminal

(b) Positive of the source to 'N' type terminal & Negative to the 'P' type terminal.

3.2 Analyzing the flow of current in both the directions, cause of the difference in magnitudes of current in the two directions.

3.3 Characteristics of a P-N Junction diode in forward/reverse biasing.

3.4 Concepts of unidirectional and bi-directional flow of currents. Effect of putting in diode in series with a load connected across an ac source.

3.5 Half wave rectifier, Full wave rectifier9 using C.T. transformer, using bridge circuits)

3.6 Special purpose diodes:Zener diode, Vractor diode,Photo Diode,Light emiiting Diode (LED), their chractersitics and uses.

4. TRANSISTOR:

4.1 Growing a Crystal having two P-N Junction back to back (i.e.PNP & NPN); Junction transistor structure; acton of transistor in FF,RR,FR and RF biasiing; working of a tranistor; relation between different currents in a transistor;

4.2 Various configurations of transistor (CB,CE,CC);ralation between.Transistor action in three configuration; Comparison between the three configuration of transistor;

4.3 Input and Output characteristics of a transistor;

4.4 Field - effect transistor (JFET,IGFET,MOSFET);

5. TRANSISTOR AS AN AMPLIFIER:

5.1 Transistor biasing: DC Operating: need of biasing & bias stablization in a transistor circuit; various biasing circuits(Fixed, Collector to base, emitter, and potential devider.);

5.2 DC and AC load lines in a typical CE amplifier circuit;

5.3 Need of using multi- stages; how to couple two stages ;

various coupling arrangements(R-C coupling,Transformer

coupling, Direct coupling):

5.4 Effect of coupling arrangement on the requency response of a two stage amplifieer; frequency response curve of a RC coupled amplifier; a transformer coupled amplifier; band with of an amplfier.

6. OPERATIONAL AMPLIFIERS:

6.1 Specifications of ideal operational amplifier and its block diagram.

6.2 Definition of inverting and noninverting inputs, differential voltage gain and input and output off set, voltage input offset current, input bias current, common mode rejection ratio (CMMR), power supply rejection ratio (PSRR) and slew rate.

6.3 Method of offset null adjustments, use of op.amp. as an inverter scale changer, adder, subtractor, differential amplifier, buffer amplifier, differentiator, integrator, comparator, Schmitt Trigger, Generation of Square and Triangular Waveform, log and anti-log amplifiers, PLL and its appliation and IC power amplifier.

7. FEED BACK IN AMPLIFIER:

7.1 Concept of Feed back;

7.2 Types of feed back(Positive, Negative); different arrangement of feed back(series voltage, series- current, shunt -voltage, shunt current);

7.3 Voltage gain of feed back amplifier;(A'=A/(a) +A)

7.4 Analysis of Negative feed back arrangement on (Gain,Stability, Noise, Input/output impedances, Band width); Amplifier circuits with negative feed back;

7.5 Positive feed back; condition for infinite gain(AB=1 in Positive feed back)

7.6 Oscillator as an infinite gain feed back.

8. TRANSISTOR AS A SWITCH:

8.1 Control action of base current on the colector current in a transitor circuit .

8.2 Large singal amplifier (input changing from cut-off to saturation).

8.3 Remote control of a realy - opertated lamp employing amplifier .

8.4 Requirements of a transistor - switch .

9. MULTIVIBRATORS:

9.1 Regeneration: relaxation oscllators;

9.2 Simple astable MV circuit arrangement for its self starting;

9.3 Study and analysis of BI – STABLE MULTIVIBRATOR;

9.4 Study and analysis of mono stable multivabrator;

9.5 Triggering requirements;

9.6 Schmit trigger circuit;

10. INTEGRATED CIRCUITS:

10.1 Introduction;

10.2 Manufacturing process;

10.3 SSI, MSI, LSI, VLSI, ICs;

10.4 Linear and Digital ICs;

10.5 Switching and Gating ICs;

10.6 DTL, TTL, ICs;

LIST OF PRACTICALS

1. To Identify electronic devices and common passive components: such as Diodes (Rectifier, Zeners, Signal Diodes, Varacter diode, etc.); LED's; Transistors; Ics; Resistors, Capacitors, (Colour code for them); Inductors, Transformers.

2. To Plot characteristics (FB/RB) of Semiconductor rectifier diode.

3. To Plot characteristics (FB/RB) of a zener diode.

4. Observe the output wave of a Half wave rectifier circuit with/without shunt capacitor filter.

5. Observe the O/P wave of a full wave (C.T.) Rectifier circuit with/without Shunt capacitor filter.

6.   Observe   the   O/P   wave   of   a   Bridge   Rectifier
     circuit with/without shunt capacitor filter.

7.   To Plot input/output characteristics of a Transistor in CB.

8.   To Plot input/output characteristics of a Transistor in CE.

9.   To Plot input/output characteristics of a FET.

10. To measure Voltage gain of a transistor amplifier at 1 KHz
     signal, at different load.

11. To measure over all Voltage gain of a 2 stage RC coupled
     transistor amplifier a 1 KHz signal.

12. To plot frequency response of a RC coupled amplifier at 1
     KHz signal.

13. To measure input and output impedance of a negative feedback
     amplifier.

14. To fabricate a transistor switch and verify its working.

15. To observe the output of an Astable multivibrator.

16. To observe the output of a Bi-stable multivibrator.

17. To observe the output of an Monostable multivibrator.

18. Use OP-AMP as inverting and non-inverting amplifier, Use as
     Adder, Subtractor, Intergator and differentator.

II YEAR
                   2.1 APPLIED MATHEMATICS II

           [Common to All Engineering Courses]

                                          L   T   P
                                          3   1   -

Rationale :

        The study of mathematics is an important requirement
   for the understanding and development of concepts of Engg.The
   purpose of teaching mathematics to the Diploma Engg. students
   is to give them basic foundation and understanding of
   mathematics   so that   they can use the same for   the
   understanding of engineering subjects and their advancements.

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Sl.No.   Units   Coverage Time
_____L___T___P___

1.	Matrices	15	5	–
2.	Ordinary Differential Equations	15	5	–
3.	Differential Calculus-II	15	5	–
4.	Integral Calculus-II	15	5	–
5.	Probability & Statistics	15	5	–
		75	25	–

DETAILED CONTENTS

1. MATRICES :

1.1 Algebra of Matrices, Inverse :

Addition, Multiplication of matrices, Null matrix and a unit matrix, Square matrix, Determinant of a matrix, Cofactors, Definition and Computation of inverse of a matrix.

1.2 Elementry Row/Column Transformation :

Meaning and use in computing inverse and rank of a matrix.

1.3 Linear Dependence, Rank of a Matrix :

Linear dependence/independence of vectors, Definition and computation of a rank of matrix. Computing rank through determinants, Elementary row transformation and through the concept of a set of independent vactors,Consistency of equations.

1.4 Types of Matrices :

Symmetric, Skew symmetric, Hermitian, Skew hermition, Orthagonal, Unitary, diagonal and Triangular.

1.5 Eign Pairs, Cayley-Hamilton Theorem :

Definition and evaluation of eign values and eign vectors of a matrix of order two and three, Cayley-Hamilton theorem (without Proof) and its verification, Use in finding inverse and powers of a matrix.

2. ORDINARY DIFFERENTIAL EQUATION :

2.1 Formation, Order, Degree, Types, Solution :

Formation of differential equations through physical, geometrical, mechanical and electrical considerations, Order, Degree and Meaning of solution of a differential equation, Linear, Nonlinear equation.

2.2 First Order Equations :

Variable seperable, equations reducible to seperable forms,
Linear and Bernoulli form exact equation and their solutions.

2.3 Second Order Linear Equation :

Property of solution, Linear equation with constant
coefficients, canchy type equation. Homogeneous and Non-
homogeneous equations, equations reducible to linear form
with constant coefficients.

2.4 Simple Applications :

LCR circuit, Motion under gravity, Newton's law of cooling,
radioactive decay, Population growth, Force vibration of
a mass point attached to spring with and without damping
effect. Equivalence of electrical and mechanical system

3.   DIFFERENTIAL CALCULUS-II :

3.1 Function of two variables, identification of surfaces in
space

$$z = x2 + y2, \quad x2 + y2 = a2, \quad x + y = 2$$

$$\frac{x2}{a2} + \frac{y2}{b2} + \frac{z2}{c2} = 1 \qquad \frac{x2}{a2} - \frac{y2}{b2} + \frac{z2}{c2} = 1$$

3.2 Partial Derivatives :

Directional derivative, Gradient, Use of gradient f, Partial
derivatives, Chain rule, Higher order derivatives, Eulens
theorem for homogeneous functions, Jacobians.

3.3 Vector Calculus :

Vector function, derivatives, gradient, divergence and curl
Some indentities among these.Five integrals, double and
triple integral, surface integral, Grean, Gauss and stokes
theorem and application

4.   INTEGRAL CALCULUS - II

4.1 Laplace Transform :

Definition, Basic theorem and properties, Unit step and Periodic functions, Solution of ordinary differential equations.

4.2 Beta and Gamma Functions :

Definition, Use, Relation between the two, their use in evaluating integrals.

4.3 Fourier Series :

Fourier series of f(n)-n<x<n, Odd and even function, Meaning of the sum of the series at various pairs.

5.   PROBABILITY AND STATISTICS :

5.1 Probability :

Laws and Conditional probability

5.2 Distribution :

Discrete and continuous distribution.

5.3 Binomial Distribution :

Properties and application through problems.

5.4 Poisson Distribution :

Properties and application through problems

5.5 Normal Distribution :

Properties and applications through problems

5.6 Method of Lease-quare.

2.2 PROGRAMMING IN C & C++

(Common to Diploma In Information Technology, Post Graduate In Computer Application, Post Diploma In Information Technology)

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                                    L   T   P
                                    3   1   4
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Rationale :

For solution of different problems, C is a very powerful high level language. It is widely used in research

and engineering problems. A software technician must be aware of this language for working in computer environment.

TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Units	Coverage Time		
		L	T	P
1.	Concept of Programming	10	5	
2.	Programming in C	30	15	–
3.	Classes & Objects	30	15	
4.	Programming in C++	30	15	
		100	25	100

DETAILED CONTENTS

1. CONCEPT OF PROGRAMMING:

Concept of Flowcharing, algorithm,programming, Structured Programming Various techniques of programming, Use of programming.

2. Programming in C:

Data Types, Operators and Expressions;Input & Output printf, scanf, clibrary Control Statement: IF- ELSE, While, For, Do-While, Switch; Functions and modular programming; Scope of variables, parameter passing, recursion, block structure; preprocessor statements; pointers and arrays; structures and unions; File handling.

3.CLASSES & OBJECT:

What is a class,what is an object,constructors,types of object(external,automatic static, Dynamic objects) Metaclass,role of meta class.Scope of classes, array of objects, objects as a function argument.

4.Programming in C++

What is object-orientation, area of object technology,C++, getting to grips with C++(data types,escape sequence,characters, variables, operator, notation, Arrays,Function conditional statements.call by value,call by reference.Pointer : C++ memory map, dynamic allocation pointers,pointers with arrays.Structure,structure with arrays,passing, structure of function.Enumerated data types, Inherentance, apolymorphism & Overloading.

List of Experiments

1. Exercises involving output and input format controls in Pascal.

2. Exercises involving control transfer statements in C & C++

3. Exercises with arrays & Pointers in C & C++.

4. Exercises with functions in C & C++.

5. Exercises with files in C & C++.

2.3 DATA COMMUNICATION AND COMPUTER NETWORKS

(Common To Information Technology)

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                                    L    T     P
                                    3    2/2   -
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Rationale :

TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Units	Coverage Time		
		L	T	P
1.	Data Communications	5	2	-
2.	Transmission Media	10	3	-
3.	Protocols and Architecture	10	3	-
4.	Data Link Control & Protocal	10	3	-
5.	Local Aera Network	10	3	-
6.	Network Layer	10	3	-
7.	Transport Protocals	10	4	-
8.	Wide Aera Networks	10	4	-
		75	25	-

DETAILED CONTENTS

1. DATA COMMUNICATION :

    Data Transmission : Analog Transmission, Digital Transmission.

Data Encoding : Digital Data- digital signals, Digital Data - analog signals, Analog Data-Digital Signals, Analog Data-Analog Signals, Synchronous and Asynchrous Transfer.

2. TRANSMISSION MEDIA :

Twisted pair, Coaxial Cable, Optical Fibers, Wireless Transmission, Microwave, Radio Waves, Infrared.

3. PROTOCOLS AND ARCHITECTURE :

Protocals, OSI reference models, TCP/IP protocal suit.

4. DATA LINK CONTROL AND PROTOCAL :

Flow Control - Stop and Wait, Sliding window, Error Detection, Error Control, HDLC.

5. LOCAL AREA NETWORK :

LAN architecture, LAN topologies - BUS/Tree LAN, Ring LAN, Star LAN, Wireless LAN, Ethernet and Fast Ethernet (CSMS/CD), Tokeriring adn FDDI.

6. NETWORK LAYER :

Introductio , Routers, Routing Algorithms, Congestion control algorithm, Addressing, Internet working.

7. TRANSPORT PROTOCALS :

Transport services, TCP, UDP.

8. WIDE AREA NETWORKS :

WAN, Circuit switching, Packet switching, Frame relay, ATM, ISDN.

2.4 OFFICE TOOLS

(Common to Diploma In Information Technology, Post Graduate Diploma in Computer Application.)

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                                          L    T    P
                                          3    -    4
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Rationale :

   The PC's are gaining their image as personal assistants to every individual in day today life. It is only because of the softwares like Electronic spread sheet, Data base and Word Star,Without these this image of the pc's is of no worth.

TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Units	Coverage Time		
		L	T	P
1.	MS Word	20	-	-
2.	MS Excel	20	-	-
3.	Power Point	20	-	-
4.	Corel Draw	15	-	-
		75	-	100

DETAILED CONTENTS

1.   MS WORD PROCESSING:

   File : Open, Close, Save and Find File, Print and Page Setup
   Edit : Cut, Copy, Find, Replace
   Insert: Page Insert, Page No., Symbole
   Font : Paragraph, Tabs, Boder & Shading, Change Case
   Tools : Spelling, Mail Merge
   Table : Insert Table, Delete Cells, Merge Cell, Sort Text

2.   MS Excel:

   File : Open, Close, Save and Find File, Print and Page Setup
   Edit : Cut, Copy, Find, Replace, Undo, Redo
   Insert: Cell, Row, Worksheet, Chart
   Format: Data, Sort, Filter, Form, Table

3. POWER POINT

    File   : New,Open,Close,Save as HTML,Pack and Go,Page setup,Send to ,Properties
    Edit   : Cut, Copy, Find, Replace, Undo, Redo,Duplicate.
    View   : Slide_Outline,Slide_sorter,Notepage,Slideshow,Master, Black & white slide,Toolbars,Ruler ,Guides
    Insert   : New slide,Duplicate slide,Picture,Text box,Movies & sound,Hyperlink.

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        Format      : Font,Bullet,Alignment,Line spacing,Slide layout.




        Tool        : Power  point,Presentation  &   conference,Expand
                      slide,Macro,customise.
        Slide show: View show,Rehearse timing,Naration,View on two
                      screen ,Active buttons,Preset Animation,Custom -
                      animation,Slide transition.
        Window      : New window,Arrange icons,Fit to page,Cascade.


4.   COREL DRAW :

     Corel  Group, Corel Photopaint, Corel Ventura,  Corel  Draw,
     Corel show and other packages.

                         MS-OFFICE

                      List Of Practicals


1.   Creating,  Editing, Modifying database file, Label,  Report,
     Format & Query.

2.   Write programme for small systems like Marksheet preparation,
     Payroll, Inventry Control, Accounting, etc.

3.   Use all the features and utilities of MS Word.

4.   Creating, Editing, Modifying Spread Sheet, Graph, Database.

5.   Use of macros and printing of well formatted reports.

6.   Selection of command using Windows.

7.   Small projects of Power Point Presentation.

8.   Small Projects of Corel Draw.
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2.5 VISUAL BASIC.NET

(Common to Diploma In Information Technology, Post Graduate Diploma in Computer Application, Post Diploma in information Technology.)

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                                        3    -    4
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TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Units	Coverage Time		
		L	T	P
1.	Fundamental of Visual BASIC	10	–	–
2.	Introduction to Visual Basic.NET	10	–	–
2.	Programming with Module & Procedure	10	–	–
3.	Program flow & Decision Making	15	–	–
4.	Array & Control Functions	15	–	–
5.	Designing Customs Menus	15	–	–
		75	–	100

DETAILED CONTENTS

1.   FUNDAMENTAL OF VISUAL BASIC:-

Understanding Events,preparing to create the program,creating program user interface,Caption & name properties, attaching code to objects, properties for form appearance and behaviour, Control properties, Caption property, Enable property, Value property and Text property.

2.   INTRODUCTION TO VISUAL BSIC NET :

Introduction to NET framework and the common language routine, Visual Basic integrated development environment, Visual Basic.Net Application

3.   PROGRAMMING WITH MODULES & PROCEDURES :

Placing code in modules, understand the procedure, use standard code writing conventions, work with data types, variables.

4.   PROGRAMME FLOW AND DECISION MAKING :

Unconditional branching, conditional testing and branching, looping.

5.   ARRAYS & CONTROL FUNCTIONS:

Control arrays and sequential files, one dimensional and multi dimensional arrays. List box, combobox control, timer control, format control, data type conversion, input box functions, create message box.

6.   DESIGNING CUSTOM MENUS :

i) Understand the menu, editor, window, create menu

application, edit menu, polish the appearance of menus, code menu option.

ii) How to interact with ms access database with visual basic.net.

LIST OF PRACTICAL

1. Develop small software using visual basic and Visual Basic.NET (all commands).

2.6 MICROPROCESSORS AND APPLICATIONS

(Common with Electronics Engineerint, Instrumentation & Control Engineering and Computer Engineering)

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                                    L   T   P
                                    3   -   3
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TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Units	Coverage Time		
		L	T	P
1.	Over View of Microcomputer System	6	-	-
2.	Memory of A Microcomputer	12	-	-
3.	C.P.U. and Control	12	-	-
4.	Introduction To 8085 Microprocessor	12	-	-
5.	Architecture of 8086 Microprocessor	12	-	-
6.	Assembly Language Programming	12	-	-
7.	Basic I/O Interfacing	12	-	-
8.	Memory Interfacing	12	-	-
9.	Advance Microprocessor & Micro Controllers	12	-	-
		75	-	75

DETAILED CONTENTS

1. OVERVIEW OF MICROCOMPUTERS SYSTEM:

1.1 Functional block.

   (a) CPU.

   (b) Memory.

   (c) Input/Out devices (Key board, Floppy drive, Harddisk drive, Tape drive, VDU, Printer, Plotter).

1.2 Concept of programme and data memory.

(a) Registors (general purpose).

(b) external memory for storing data and results.

1.3 Data transfer between registers.

1.4 Concept of tristate bus.

1.5 Control on registers.

2. MEMORY OF A MICROCOMPUTER:

2.1 Concept of byte organised memory.

(a) Address inputs.

(b) Address space.

(c) Data input/output.

2.2 Addressing and Address decoding.

(a) Memory system organisation.

(b) Partitioning of total memory space into small blocks.

(c) Bus contention and how to avoid it.

2.3 Memory chips.

(a) Types of ROM, RAM, EPROM, PROM.

(b) Read/Write inputs.

(c) Chip enable/select input.

(d) Other control input/output signals.

- Address latching.

- Read output.

- Address strobes.

(f) Power supply inputs.

2.4 Extension of memory.

- In terms of word length and depth.

3.   C P U & CONTROL:

3.1 General microprocessor architecture.

3.1 Instruction pointer and instruction register.

3.2 Instruction format.

        -    Machine and Mnimonics codes.

        -    Machine and Assembly language.

3.3 Instruction decoder and control action.

3.4 Use of Arthematic Logic Unit.

        -    Accumulator.
        -    Temporary Register.
        -    Flag flip-flop to indicate overflow, underflow,
             zero result occurance.

3.5 Timing and control circuit.

        -    Crystal and frequency range for CPU operation.

        -    Control bus to control peripherals.

4.   INTRODUCTION OF 8085 MICROPROCESSOR:

     Evolution of Microprocessor, Register Structure, ALU, BUS
     Organization, Timing and Control.

5.   INTRODUCTION OF 8086 MICROPROCESSOR:

     Internal   organization   of 8086, Bus   Interface   Unit,
     Execuation Unit, Unit, register, Organization, Sequential
     Memory Organization, Bus Cycle.

6.   ASSEMBLY LANGUAGE PROGRAMMING :

     Addressing Modes, Data Transfer, Instructions, Arithmetic
     and Logic Instruction, Program Control Instructions (Jumps,
     Conditional   Jumps, Subroutine Call) Loop   and   String
     Instructions, Assembler Directives.

7.   BASIC I/O INTERFACING :

     Programmed I/O, Interrupt Driven I/O, DMA, Parallel I/O
     (8255-PPI, Centronics Parallel Port), Serial I/O (8251/8250,

RS-232 Standard), 8259-Programmable Interrupt Controller, 8237-DMA Controller, 8253/8254-Programmable Timer/Counter, A/D and D/A conversion.

8.   MEMORY INTERFACING :

     Types of Memory, RAM and ROM Interfacing with Timing Considerations, DRAM Interfacing.

9.   ADVANCE MICROPROCESSOR AND MICRO CONTROLLERS :

     Pentium and Power PC

NOTE :

     Study of Popular ICs Read/Write Chips-8155/8156, 2114,2148,2164. ROM Chips- 8355,2716,2732,8755. Other support chips - 8279,8257,8275,8205.

LIST OF BOOKS

1.   Singh, B. P. - Advanced Microprocessor and Microcontrollers- New Age International.

2.   Singh, B. P. - Microprcessor Interfacing and Application - New Age International.

3.   Brey, Barry B. - INTEL Microprocessor - Prentic Hall (India)-4th Edition.

4.   Liu and Gibson G.A. - Microcomputer System - The 8086/8088 Faimly-Prentice Hall (India) 2nd Edition.

MICROPROCESSORS AND APPLICATIONS LAB

List Of Practicals

1.   Assembly language programming :- Programming of simple problems.

2.   Simple programming problems using 8085 and 8086 microprocessor. Trainer kit to gain competence in the use of

     (a) 8085 and 8086 Instruction set.

     (b) Support chips of 8085 and 8086.

2.7 COMPUTER HARDWARE & MAINTENANCE

(Common to Post Graduate Diploma Computer Application)

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                                                   L    T    P
                                                   3    -    3
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Rationale :

Servicing of computer peripherals and system such as Key Board, Disk Drives, Printers, Power Supplies and different stages of the computer results in increasing efficiency and life of the computer centre. A technician having skills of servicing the above peripherials and systems will prove useful for a computer centre.

TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Units	Coverage Time L	T	P
1.	Topic 1	5	-	
2.	Topic 2	5	-	
3.	Topic 3	5	-	
4.	Topic 4	6	-	
5.	Topic 5	6	-	
6.	Topic 6	6	-	
7.	Topic 7	6	-	
8.	Topic 8	6	-	
9.	Topic 9	6	-	
10.	Topic 10	6	-	
11.	Topic 11	6	-	
12.	Topic 12	6	-	
13.	Topic 13	6	-	
		75	-	75

DETAILED CONTENTS

1.   Component and peripharal devices, Connected with computer.

2.   Mother Board : BUS, Mothre board components, Battery, Connections on the Mother Board, Keeping CPU cool, Mother board trouble shooting.

3.   Key Board : Switches, Keyboard organization, Key board type trouble shooting.

4.   Mouse : Mouse type, Connecting Mouse, Trouble shooting Mouse.

5.   HDD : Magnetic recording, Data Encoding Method, HDD feature, Head barking, HDD trouble shooting.

6.   FDD : Type and working, Maintenance.

7.   Printers : Image formation method, Printing mechanism, DMP, Ink Jet, Laser Printer. How printer works and Trouble shooting.

8.   Network : Setting up N/W, Trouble Shooting N/W.

9.   Make your own computer.

10.   Software Installation, Windows and other S/w.

11.   Boot Process

12.   How to use Pen deive and other devices.

13.   Power Supply : Operating charactersics, Types and maintenance.

HARDWARE MAINTENANCE

List Of Practicals

(I)   Study of devices on motherboard

(II)   Study of Key board & Keyboard decoder

(III) Study of Video Adopter & display controllers

(IV)   Study of Floppy Drive, CD Drive and Hard Disk.

(V)   Study of Multifunction Input/Output controllers

2.   Troubleshooting & repair of following equipment

(I)   Dot Matrix Printer, Laser, Inkjet Printer.

        (II)   Digital Plotter

        (III)   C. P. U.

        (IV)   Disk Drive

3.   Study and Trouble Shooting of

        (I)   Network

        (II) Power Supplies.

                    2.8 ELECTRONIC INSTRUMENTS AND MEASUREMENTS

        (Common   with Instrumentation & Control Engineering and
        Electronics Engineering)

                                                    L   T   P
                                                    3   -   3

Rationale :

        The modern trend of automation in the industries has
reduced the unskilled and semiskilled man power need. The
sophisticated and high tech. machine can only be handled by
trained technician equipped with sufficient knowledge and
skill   component. Electronics instrumentation has   vide
application in modern industries. A diploma student needs to
be introduced for such processes of measurements various
types of multimeters, CRO, audio power meter,   signal
generators and bridges are basic components commonly used in
in industries. To energise electronic instruments power
supplies are used as a constant voltage source so the
student must be familiar with power supplies also.

                TOPIC WISE DISTRIBUTION OF PERIODS

_____
Sl.No.   Units   Coverage Time
                                                     L___T___P____
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1.   Introduction   6   -   -
2.   Multimeters   9   -   -
3.   Electronic Multimeter   9   -   -
4.   A. C. Millivoltmeter   6   -
5.   Cathode Ray Oscillograph   12   -   -
6.   Audio Power Meter   9   -   -
7.   Signal Generator   9   -   -
8.   Impedance Bridges & Meters   9   -   -

| 9. | Regulated Power Supply | 6 | - | - |
| | | 75 | - | 75 |

DETAILED CONTENTS

1. INTRODUCTION TO THE PROCESS OF MEASUREMENTS:

1.1 Review of the terms, accuracy, precision, sensitivity range and errors, difference between accuracy, precision and resolution.

1.2 Precaution against high frequency noise pick up and remedies, shielding and grounding (two terminal and three terminals).

1.3 Concept of selective wide band measurements.

2. MULTIMETERS:

2.1 Principle of measurement of D.C. voltage and D.C. current, A.C. voltage and A.C. current and resistance in a multimeter.

2.2 Specifications of a multimeter and their significance.

2.3 Limitations with regards to frequency and impedance.

3. ELECTRONIC MULTIMETER:

3.1 Advantage over conventional multimeter for voltage measurement with respect to input impedance and sensitivity, principles of voltage, current and resistance measurements.

3.2 Specification of electronic multimeter and their significance.

4. A. C. MILLIVOLTMETER:

4.1 Types of AC millivoltmeters: Amplifier-rectifier and rectifier amplifier, block diagram and explanation of the above types of A.C. milli voltmeter.

4.2 Typical specifications and their significance.

5. CATHODE RAY OSCILLOSCOPE:

5.1 Construction of CRT, Electron gun, Electrostatic focussing and acceleration (Explanation only-no mathematical treatment) Deflection sensitivity, Brief mention of screen phospher for CRT.

5.2 Explanation of time base operation and need for blanking during flyback, synchronisation.

5.3 Block diagram and explanation of a basic CRO and a triggered sweep oscilloscope, front panel controls.

5.4 Specifications of CRO and their significance.

5.5 Use of CRO for the measurement of voltage (D.C. & A.C.) frequency using Lissagious figure, time period, phase.

5.6 Special features of dual trace, delayed sweep and storage CROs (Brief mention only).

5.7 CRO probes including current probes.

5.8 Working Principle of Spectrum Analyzer.

6. AUDIO POWER METER:

6.1 Block diagram of an audio power meter.

6.2 Principles of working its application and high frequency limitations.

6.3 Scale conversion from power to db.

7. SIGNAL GENERATORS:

7.1 Block diagram explanation of laboratory type low frequency and RF signal generators, pulse generator and function generator.

7.2 Specification for low frequency signal generator, RF generator,pulse generator and function generator. Brief idea of testing specification for the above instrumets.

7.3 Standard signal generator.

8. IMPEDANCE BRIDGES Q METERS:

8.1 Block diagram explanation of working principle of a laboratory types (balancing type) RLC bridge. Specifications of a RLC bridge, Principle of digital RLC bridge.

8.2 Block diagram and working principles of a Q meter.

9. REGULATED POWER SUPPLY:

9.1 Block diagram of regulated power supply.

9.2 Major specifications of regulated power supply, and their measurement (line and load regulation, output ripple and transients).

9.3 Basic working principles of switched mode power supply.

9.4 Concept of floating and grounded power supplies and their interconnections to obtain multipple output supplies.

9.5 Basic working principle of uninterupted power supply

10. DIGITAL INSTRUMENTS:

10.1 Comparison of Analog and Digital instruments, characteristics of digital meter.

10.2 Working principle of Ramp, Dual slope and integrating type of digital voltmeter.

10.3 Block diagram and working of a digital multimeter.

10.4 Working principle of time interval frequency and period measurement using universal counter, frequency counter, time base stability and accuracy and resolution.

ELECTRONIC INSTRUMENTS AND MEASUREMENT LAB

List Of Practicals

1. Loading effect of a multimeter and its limitations to measure high frequency voltages.

2. Measurement of Q of a coil and its dependence on frequency using a Q meter.

3. Measurement of voltage, frequency, time period, phase angle and delay time using CRO : (use of Lissagious Figures).

4. Measurement of time period, frequency, average period using universal counter frequency counter.

5. To test a power supply for ripple line and load regulation.

6. Measurement of rise, fall and delay time using a CRO.

7. Measurement of distortion of a LF signal generator using distortion factor meter.

8. Measurement of R.L. and C using a LRC bridge/universal bridge.

III YEAR
  3.1 INDUSTRIAL MANAGEMENT AND ENTREPRENEURSHIP DEVELOPMENT

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                                        L    T    P
                                        2   2/2   -
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Rationale:

      The knowledge of this subject is required for all engineering technicians, but it becomes more important for those technicians who wish to choose industry as their career. This course is designed to develope   understanding of   various   functions   of   management,   role of workers, and engineers, industrial safety, trade unions, wages and incentives, marketing, entrepreneurship, inventory control and industrial legislation.

_____
Sl.No.   Units   Coverage Time
                                              L   T   P
_____

Sl.No.	Units	L	T	P
1.	Principles of Management	10	4	-
2.	Human Resource Management	3	2	-
3.	Human and Industrial Relations	4	3	-
4.	Personnel Management	6	3	-
5.	Financial Management	6	3	-
6.	Material Management	4	3	-
7.	Labour, Industrial and Tax Laws	4	2	-
8.	Entrepreneurship Development	8	4	-
9.	Intellectual Property Rights	5	1	-
		50	25	-

DETAILED CONTENTS

1. PRINCIPLES OF MANAGEMENT :

    Definition   of management, Administration   organisation, Functions management, Planning, Organizing, Co-ordination and   control,   Structure and   function   of   industrial organisations, Leadership- Need for ledership, Factors to be considered   for   accomplishing   effective   leadership, Communication   -Importance, Processes,   Barriers   to

communication, Making communication, Effective, formal and
informal communication, Motivation - Factors determining
motivation, Positive and negative motivation, Methods for
imporving motivation, Incentives, Pay promotion and rewards,
Controlling - Just in time, Total quality management,
Quality circle, Zero defect concept. Concept of Stress
Management

2. HUMAN RESOURCE DEVELOPMENT :

    Introduction, Staff development and career development,
    Training strategies and methods.

3. HUMAN AND INDUSTRIAL RELATIONS :

    Human relations and performance in organisation, Understand
    self and others for effective behaviour, Industrial relatios
    and disputes, Charcteristics of group behaviour and Trade

    unionism, Mob psychology, Labour welfare, Workers
    participation in management.

4. PERSONNEL MANAGEMENT :

    Responsibilities of human resource management - Policies and
    functions, Selection - Mode of selection - Procedure -
    training of workers, Job evalution and Merit rating -
    Objectives and importance wage and salary administration -
    Classification of wage, Payment schemes, Components of wage,
    Wage fixation.

5. FINANCIAL MANAGEMENT :

    Fixed and working capital - resource of capital, Shares,
    types preference and equity shares, Debentureptypes, Public
    deposits, Factory costing, Direct cost, Indirect cost,
    Factory over head, Fixation of selling price of product,
    Depreciation- Causes, Methods.

6. MATERIAL MANAGEMENT :

    Objective of a good stock control system - ABC analysis of
    inventory, Procurement and conumption cycle, Reorder level,
    Lead time, Economic order quantity, Pruchasing procedure,
    Stock keeping, Bin card.

7. LABOUR, INDUSTRIAL AND TAX LAWS :

    Importance and necessity of industrial legistation, Types of
    labour laws and dispute, Factory Act 1948, Payment of Wages

Act 1947, Employee State Insurance Act 1948, Various types of taxes - Production Tax, Local Tax, Trade tax, Excise duty, Imcome Tax.

8.   ENTREPRENEURSHIP DEVELOPMENT :

Concept of entrepreneurship, need of entrepreneurship in context of prevailing employment conditions of the country. Sucessful entrepreneurship and training for entrepreneurship development. Idea of project report preparation.

9.   INTELLECTUAL PROPERTY RIGHTS :

Introduction to IPR (Patents, Copy Right, Trade Mark), Protection of undisclosed information, Concept and history of patents, Indian and International Patents Acts and Rules, Patentable and Nonpatentable invention including product versus Process.

NOTE : Entrepreneurship Awareness camp to be organised at a stretch for Two or Three days. Lectures will be delivered on Entrepreneurship by industries experts at institute level.

3.2 DATA STRUCTURE USING C & C++

(Common to Post Diploma in Computer Science & Engg. and Post Graduate Diploma In Computer Application)

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                                          L   T   P
                                          3   2/2 4
```

Rationale :

For solution of different problems 'C' is a very powerful high level language. It is widely used in research and engineering problems. A software technician aware of this language will be useful for working in computer environment.

TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Units	L	T	P
1.	Basic Concepts.	8	3	
2.	Stacks And Queues	10	3	
3.	Lists	12	4	
4.	Sorting & Merging	11	4	
5.	Tables	11	3	
6.	Trees	12	4	
7.	Graphs	11	4	

_____

DETAILED CONTENTS

1. BASIC CONCEPTS:

    Basic   concepts and notation & Mathematical background

2. Stacks And Queues

    Representation of stacks & queues,linked sequential.

3. LISTS:

    List   representation   techniques,Multilinked   structures,
    Dynamic storage allocation techniques.

4. SORTING ALGORITHMS

     Insertion sorts, Bubble sort, Quicksort, Mergesort, Heapsort

5. Tables: -

    Searching sequential tables,Hash tables and Symbol tables,
    Heaps.r

6. TREES

    Definitions   and   basic   concepts,   Linked   tree
    representations,binary tree traversal algorithms,B-trees and
    their applications.
7. Graphs:

    Depths-first-search.

DATA STRUCTURE USING C & C++

List of Experiments

1. Write a program on Linked List Using   'C' & C++.

2. Exercise on Stack, Queues. Using C & C++

3. Exercises on Sorting .

3.3 INTERNET & WEB TECHNOLOGY

(Common with Post Graduate Diploma In Computer Application,
Post Diploma In Inforamtion Technology)

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                                             L   T   P
                                             3   -   4
```

TOPIC WISE DISTRIBUTION OF PERIODS

_____

Sl.No.	Units	Coverage Time		
		L	T	P
1.	Internet	30	-	-
2.	Web Technology	45	-	
		75	-	100

9   3   -

_____

INTERNET

Introducing Internet, Its Uses : Why Internet, Basic
internet Tools, E-Mail, Ftp, Telnet, Usenet News, Web
Browsers, Search Engines, Yahoo, Archie, Infoseak, Veronica,
World Wide Web.
    How Internet works: Administration of Internet, How to
Go On Internet : Requirements, Hardware, Software, ISP,
Internet Account PPP/Shell. How to Use E-Mail Services On
Internet Introducing Hotmail/Yahoo/Vsa-Net, How To Operate
E-Mail address, How to Operate E-Mail Services : Sending E-
Mail, Forwording, Saving, Reading etc., How to attach files,

2.   WEB TECHNOLOGY :

A.   HTML:

Elements of HTML, HTML sources & Rules of nesting, syntax
conventions, HTML Categories, text tags, Formatting WebPages
by using Styles, adding pictures, image attribute   ,
introduction to forms, tables and models,advantages   &
limitations of tables, frames, links. SS cascading style
sheets, XHTML, XML, Cient Side Scripting, Server Side
Scripting, Managing data with SQL.

B.   JAVA SCRIPTS:

i)JAVA SCRIPTS:what is a Java Scripts, adding, Java scripts
to documents, embedding java scripts, linking java scripts,
creating a page program with scripts. What is a Java and its
appletes, to make webpages run server sripts, activeX.

C.   ASP PROGRAMMES :

What is ASP, What can ASP do for you, How to install IIS and
Run ASP on windows XP, Basic syntax rules (V.B. Script, Java
Script and o/p syntax used in ASP, Procedures, Functions,
Forms. Radio buttons, Check Box, Data Base Connectivity.

D.   Web building.

PRACTICAL

1. Excercises on E-Mail.
2. Excercises on to see web sites.
3. Development of different Websites using all tools.
4. Development of Websites useing Frontpage

3.4 CONCEPTS OF RELATIONAL DATABASE MANAGEMENT SYSTEM USING ORACLE.

(Common to Computer Science & Engineering, Post Graduate
Diploma in Computer Application, Post Diploma in
Information Technology).

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                                          L  T  P
                                          3  -  3
```

Rationale:

Relational Database management system is the modern
technique of managing data. The knowledge of DBMS is very useful
& effective in prepration of different types of application
software like Inventory, Financial & Accounting system etc. The
student equiped with knowledge of this subject will be useful in
the areas of the computer application.

TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Units	Coverage Time		
		L	T	P
1.	Concepts of DBMS	13	-	-
2.	Relational Database design	17	-	-
3.	File Organisation Techniques	13	-	-
4.	Security and Privacy	17	-	-
5.	SQL	15	-	-
		75	-	75

DETAILED CONTENTS

1. CONCEPTS OF DBMS :

Data items, DBA, Entity, Attributes, Logical and Physical
data, Primary and secondary keys, Form of query, Redundancy,
Schema and Sub-schema.

2. RELATIONAL DATABASE DESIGN

Define data model, classify data model, object based
logical model, Record based data model, entity, attribute,
Relationship, data model, network model, hierarchy model,
top down approch, bottom approach of logical database, need
of normalization. Types of normal form function and
dependency, properties of relation.

3. FILE ORGANISATION TECHNIQUES

    Sequential index, Sequential and Randam File organisation
    technique and their relative advantages and disadvantages.

4. SECURITY AND PRIVACY

    Integrity, protection, security, concurrency, recovery.

5. SQL

    Introduction to SQL commands, Type of SQL commands and its
    application -DDL, DML, DLL,PL/SQL Commands.

RELATIONAL DATA BASE MANAGEMENT SYSTEM

List Of Practicals

1. Programms in ORACLE using relational structures for

    complicated systems.

2. Programms and reports generation through ORACLE & SQL.

3.5 JAVA PROGRAMMING


```
                                        L   T   P
                                        3   -   4
```

TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Units	Coverage Time L T P		
1.	An Overview of Java	15	-	-
2.	Data Types & Control Statement	12	-	-
3.	Introducing Classes & Methods	12	-	-
4.	Inheritance	12	-	
5.	Multi threaded Programming	12	-	-

6.	Input/Output Applits	12	–	–
		75	–	100

1.   An Overview of JAVA:-

Introduction to Object Oriented Programming (two paradigms, abstraction, the three oops principles) creation of JAVA, JAVA Applits & applications, security & portability.

2.   Data Types & Control statements:

Integer,floating point type, character, boolean, all Operators, JAVA's selection statements,iteration and jump statement

3.   Introducing Classes & Methods:

Class fundamentals, declaring objects, overloading methods & constructs,access control, nested and inner classes, exploring the string class,Inheritance

4.   Inheritance:

Inheritance basics,member access and inheritance.

5.   Muti threaded Programming.:

The JAVA thread model,thread priority, synchronozation, Messaging.

6.   Input/Output Applits:

I/O Basics, byte streams & character streams, predefined streams, reading and writing console input/output, reading and writing files, applet fundamentals,applete class.

<div align="center">LIST OF PRACTICALS</div>

PROGRAMS USING CONTROL STATEMENTS.

<div align="center">3.6 MIS & SYSTEM ANALYSIS & DESIGN</div>

(Common to Post Diploma in Information Technology, Diploma in Computer Science & Engineering)

```
                                        L  T  P
                                        3  -  -
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<div align="center">TOPIC WISE DISTRIBUTION OF PERIODS</div>

Sl.No.	Units	Coverage Time		
		L	T	P
1.	Intoduction to Management System	6	–	
2.	Level Of Management	10	–	
3.	Influence of Information Technology	12	–	
4.	The System Concepts & Characteristics	10	–	–
5.	Elements of a System & System Development	10	–	–
6.	Detailed Syatem Analysis	9	–	–
7.	Structured System Analysis Tools	9	–	–
8.	The process and Stages of System Design	9	–	–
		75	–	–

(Note: a "12 – –" appears in the left margin near item 6)

1.   Introduction to Management System.

What is information, components of Information system. What is MIS, Meaning, need role and importance, evaluation of MIS,Traditional management System Vs MIS, components of MIS, Common managerial, Process, Planning, organising & Controlling. Types of information system TPS,DSS,MIS.Assumptions & limitations of each system.System requirements.

2.   Level Of Management

Strategic, tractical & operational level, different functions of each level, characteristics of informations & its need. flow of information in levels, concepts of balance MIS, effectiveness and efficiency criteria.

3.   Influence of Information Technology

Problems with MIS, causes and solutions, Knowledge requirements for MIS, need and role in decision making, advantages of knowledge based system, types of knowledge system.Knowledge requirement for MIS.

4.   The System Concepts, Characteristics   -

Organization, Interaction, Interdependence, Integration, Control Objective.

5.   Elements of a System & System Development:

Inputs and outputs, Processors, Controls, Feedback, Environment, Boundaries and Interface, Examples of System.System Development Life Cycle, Phrases in SDLC(Only Definition) - Problems Identification, Preliminary Investigation/Study, Types of Feasibility - Operational,

Technical, Economical, System Analysis, System Design, Testing, Implementation.

6. Detailed Syatem Analysis-

   Primary Investigation, Facts, Gathering and its techniques(Interviews, Questionnaires, Background Reading, On site Oberservation, Record Gathering)

7. Structured System Analysis Tools for

   SSA(Data Flow Diagrams, Data Dictionary. Decision Tree, Decision Table, Pros and Cons of each Table.

8. The process and Stages of System Design:

   Logical & Physical-Design, Design methodologies in Brief, Input/Output and Forms Design, Input Design(Input Data, Media and devices),Output Design.

3.7 COMPUTER GRAPHICS

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L   T   P
3   -   4
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Rationale :

        Computers are, now a days, used in industry for designing and manufacturing purposes also. Computer graphics is a powerful tool for obtaining plenty of designs by variation of different parameters which are not ordinarily possible. It also gives quality assurance in the manufacturing industries. A student equiped with must knows, how will be useful in the relevant field.

TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Units	Coverage Time		
		L	T	P
1.	Introduction of Graphics	15	-	-
2.	Display Techniques & Devices	15	-	-
3.	Graphic Package & Display Files	15	-	-
4.	Two Dimensional transformation	15	-	-
5.	Input Devices	15	-	-
		75	-	100

DETAILED CONTENTS

1. INTRODUCTION:

    Origins of computer Graphics, Display Device - General
    purpose Graphics Software, display of solids object.

2. DISPLAY TECHNIQUES AND DEVICES

    Display Techniques and Devices: Point Plotting Techniqu
    Coordinate systems and incremental methods, line-Drawing.
    Algorithms, circle Generators, Display Devices, CRT, Inheret
    Memory Devices, The storage tube display, Refresh line-draw
    display.

3. GRAPHIC PACKAGES AND DISPLAY FILES:

    A Simple Graphics package Segments, Functions for Segmenting
    the Display files, posting and Unposting, Segment naming
    schemes, Appending the Segment display file structure.
    Geometric Models. Defining symbols procedures, Display
    procedure.

4. TWO DIMENSIONAL TRANFORMATION

    Principles, concatenation Matrix representation. A line
    clipping Algorithm, Midpoint, division, Clipping other
    Graphics Entities, Polygon Clipping, Viewing Transformation.
    The windowing Transformation.

5. INPUT DEVICES:

    Pointing and positioning Devices, Mouse lets, the light pen,
    Three Dimensional input devices.

                    LIst of Experiments

1. Practice on Computer Aided Drafting and Design.
2. Draw the Line & Circles
3. Transformation, Scaling, rotation of any objects.

         3.8 ENVIRONMENTAL EDUCATION & DISASTER MANAGEMENT
                                        L T P
                                        2 - -

RATIONALE:

A diplima student must have the knowledge of different types of pollution caused due to industrialisation and construction activities, so as he may help in balancing of eco-system and control pollution by providing controlling measures. They should be also aware of the environmental laws for effectively controlling the pollution of environment. The topics are to be taught in light of legislation Para-3.

TOPIC WISE DISTRIBUTION OF PERIODS:

SL. NO.	TOPIC	L	T	P
1.	Introduction	6		
2.	Pollution	3		
2.1	Water Pollution	8		
2.2	Air Pollution	8		
2.3	Noise Pollution	3		
2.4	Radio Active Pollution	4		
2.5	Solid Waste Management	5		
3.	Legislations	3		
4.	Environmental Impact Assessment	4		
5.	Disaster Management	6		
	TOTAL	50	–	–

DETAILED CONTENTS

1.   INTRODUCTION :

-    Basics of ecology, Ecosystem, Biodiversity Human activities and its effect on ecology and eco system, different development i.e. irrigation, urbanization, road development and other engineering activities and their effects on ecology and eco system, Mining and deforestation and their effects.

-    Lowering of water level , Urbanization.

-    Biodegradation and Biodegradibility, composting, bio remediation, Microbes .Use of biopesticidies and biofungicides.

-    Global warning concerns, Ozone layer depletion, Green house effect, Acid rain,etc.

2.   POLLUTION :

Sources of pollution, natural and man made, their effects on living environments and related legislation.

2.1 WATER POLLUTION :

-   Factors contributing water pollution and their effect.

-   Domestic waste water and industrial waste water. Heavy metals, microbes and leaching metal.

-   Physical, Chemical and Biological Characteristics of waste water.

-   Indian Standards for qulity of drinking water.

-   Indian Standards for quality of treated waste water.

-   Treatment methods of effluent (domestic waste water and industrial/ mining waste water), its reuse/safe disposal.

2.2 AIR POLLUTION :

Definition of Air pollution, types of air pollutants i.e. SPM, NOX, SOX, GO, CO2, NH3, F, CL, causes and its effects on the environment.

-   Monitoring and control of air pollutants, Control measures techniques. Introductory Idea of control equipment in industries i.e.

    A. Settling chambers
    B. Cyclones
    C. Scrubbers (Dry and Wet)
    D. Multi Clones
    E. Electro Static Precipitations
    F. Bog Fillers.

-   Ambient air qulaity measurement and their standards.

-   Process and domestic emission control

-   Vehicular Pollution and Its control with special emphasis of Euro-I, Euro-II, Euro-III and Euro IV.

2.3 NOISE POLLUTION :

Sources of noise pollution, its effect and control.

2.4 RADISACTIVE POLLUTION :

Sources and its effect on human, animal, plant and material, means to control and preventive measures.

2.5 SOLID WASTE MANAGEMENT :

Municipal solid waste, Biomedical waste, Industrial and

Hazardous waste, Plastic waste and its management.

3. LEGISLATION :

Preliminary knowledge of the following Acts and rules made thereunder-

-   The Water (Prevention and Control of Pollution) Act - 1974.

-   The Air (Prevention and Control of Pollution) Act - 1981.

-   The Environmental Protection (Prevention and Control of Pollution) Act -1986. Rules notified under EP Act - 1986 Viz.

    #   The Manufacture, Storage and Import of Hazardous Chemical (Amendment) Rules, 2000

    #   The Hazardous Wastes (Management and Handling) Amendment Rules, 2003.

    #   Bio-Medical Waste (Management and Handling) (Amendment) Rules, 2003.

    #   The Noise Pollution (Regulation and Control) (Amendment) Rules, 2002.

    #   Municipal Solid Wastes (Management and Handling) Rules, 2000.

    #   The Recycled Plastics Manufacture and Usage (Amendment) rules, 2003.

4. ENVIRONMENTAL IMPACT ASSESSMENT (EIA) :

-   Basic concepts, objective and methodology of EIA.

-   Objectives and requirement of Environmental Management System (ISO-14000) (An Introduction).

5. DISASTER MANAGEMENT :

Definition of disaster - Natural and Manmade, Type of disaster management, How disaster forms, Destructive power, Causes and Hazards, Case study of Tsunami Disaster, National policy- Its objective and main features, National Environment Policy, Need for central intervention, State Disaster Authority- Duties and powers, Case studies of various Disaster in the country, Meaning and benifit of vulnerability reduction, Factor promoting vulnerability

reduction and mitigation, Emergency support function plan.

Main feature and function of National Disaster Management Frame Work, Disaster mitigation and prevention, Legal Policy Frame Work, Early warning system, Human Resource Development and Function, Information dissemination and communication.

3.9 PROJECT

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                                    L   T   P
                                    -   -   4
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Rationale:

The purpose of including project in curriculum is to develop skill and knowledge specifications of hardware used in computers. It will also develop the capability of assembly and testing of project and its stages.

GENERAL OBJECTIVE:

Purpose of the project work is :

(i) To develop abilities of diagnosing problems.

(ii) To develop the abilities to :

    (a) Make literature survey.

    (b) Design/develop/frbricate/test simple circuits.

    (c) Prepare documents for electronic work.

    (d) Work as a team.

1. COMPUTER SCIENCE PROJECT (SW/HW):

The student is expected to work on a project in consultation and acceptance with the instructor on either system software or hardware aspects related to industrial environment. The student is also expected to fabricate different cards used in PC, their testing and assembly of PC.

The end targets for the project should be well defined and evaluation should place major importance on meeting these targets.

2.   DATA PROCESSING PROJECT:

The student is expected to work and learn from implementing
an application software and study its functional   and
performance aspects and submit a report.

The evaluation must be based on the project report and the
seminars.

3.   MAINTENANCE PROJECT:

Similar as Computer Science Project (Software & Hardware),
related to maintenance operation and evaluation of the
systems.

DIPLOMA IN COMPUTER SCIENCE AND ENGINEERING
STAFF STRUCTURE

Intake of the Course   60
Pattern of the Course   ANNUAL SYSTEM

Sl. No.   Name of Post   No.

Sl. No.	Name of Post	No.	
1.	Principal	1	
2.	H.O.D.	1	
3.	Lecturer Electronics	1	
4.	Lecturer In Computer Science & Engineering	4	
5.	Computer Programmer Cum Operator	3	
6.	Lecturer in Maths	1	Part time or common
7.	Lecturer in Physics	1	with other discipline
8.	Lecturer in Comm. Tech.	1	
9.	Lecturer in Elect. Engg.	1	
10.	Steno Typist	1	
11.	Accountant / Cashier	1	
12.	Student / Library Clerk	1	

13.	Store Keeper	1
14.	Class IV	6
15.	Sweeper	Part time as per requirement
16.	Chaukidar & Mali	As per justification

Note :

1. Services of other discipline staff of the Institute may be utilized if possible

2. Qualifications of Staff : as per service rule

SPACE REQUIREMENT

[A]   ADMINISTRATIVE BLOCK

Sl. No.	Details of Space	Floor Area Sq. metres
1.	Principal's Room	30
2.	Confidencial Room	10
3.	Steno's Room	6
4.(a)	Office including Drawing Office	80
(b)	Record Room	20
5.	Staff Room	
	(a) Head 1	15
	(b) Lecturer 10 sq.m./ Lect. for 8 Lecturers	80
6.	Library and Reading room	150
7.	Store	100
8.	Students Common room	80
9.	Model Room	90

[B]   Academic Block

```
Sl.No.    Detail of Space              @       Floor Area
                                       Sq.m    Sq.m.

 1.       Class Room                   60        180
 2.       Drawing Hall                 90         90
 3.       Physics Lab                             75
 4.       Electrical Engg. Lab                   120
 5.       Electronic  Laboratory                 120
 6.       Digital Electronics & Microprocessor   120
          Lab
 7.       Computer Centre (Air Cond.Glass Partition
          and Special type pvc flooring and
          false ceiling ), Two Computer Centers  120
          For Space of 60 Sq. m
```

[D] Student's Aminities

```
1.     Hostel                      40  %   of Strength of Students
2.     Cycle Stand                 50  %   of Strength of Students
3.     Canteen and Tuck shop       50
4.     N.C.C. Room                 70
5.     Dispensary                  40
6.     Guest Room(Attached Bath) 45
       incuding kitchen & store
```

[E] STAFF RESIDENCES

```
1.     Principal                   1    100     100
2.     Head of the Department      1    100     100
3.     Lecturer                    4     80     320
4.     Non teaching & Supporting   8     60     480
       staff
5.     Class IV                    6     30     180
```

Priorty to be given in following order

(1)
 a. Administrative Building
 b. Labs
 c. Over head Tank
 d. Boundary Wall
 e. Principal Residence
 f. Forth Class Quarters (2/3)

(2)
 a. Hostel
 b. Students Aminities

(3)
 Residences of employee

ELECTRONICS LABORATORY

Electronic Components And Devices Lab.

S.No.	Name of the Equipment/ Board/Kit Etc.	Elex. Components& & Devices . Lab.		Rate per Piece	Total Cost
		Intake		In Rs.	Intake
		30 45			30 45
1.	Auto Oscillator	2 3		2000	4000 6000
2.	Multimeter, 20 K. Ohm per volt Sensitivity, + 1% accuracy d.c. voltage 2500 v. max.	2 3		1000	2000 3000
3.	Digital Elex. multimeter.	7 9		3000	2100 27000
4.	Regulated Power Supply 0-30 V,	5 7		2000	10000 14000

Sr.	Item					
	0.5/1 Amps.					
5.	Dual Power Supply 0-30 V, 1Amps	2	3	2500	5000	7500
6.	Power Supply 0-300 Volt	-	-			
7.	C.R.O. (0-10 MHz)	2	3	10000	20000	30000
8.	Dual Trace C.R.O. (0-10 MHz)	1	2	15000	15000	30000
9.	R.F.Signal Generator	-	-			
10.	Function Generator	-	-			
11.	A.C. Millivolt Meter (Elex.)	-	-			
12.	Out Put Audio Power Meter 215 K - 20 K & 1 MW - 10 MW	-	-			
13.	A.C. Milliammeter/A.C. Micro-meter & A.C. Millivoltmeter (Suitable range)	4	5	200	800	1000
14.	D.C. Voltmeter /D.C. Milliamme-ter/D.C. Micrometer (suitable range)	20	25	200	4000	5000
15.	Decade Resistance Box	-	-			

S.No.	Name of the Equipment/ Board/Kit Etc.	(Different ranges)		
16.	Decade Capacitor Box (Different range)	- -		

Cont.

S.No.	Name of the Equipment/ Board/Kit Etc.	Elex. Components & Mat.Lab.	Rate per Piece	Total Cost
		Intake	In Rs.	Intake
		30 45		30 45
17.	Decade Inductance Box	- -		
18.	Different Transducers : pressure type, thermo couple, LVFT, Opto pick electromagnetic pick up; Thermal relay, ultra- sonic pick up and potentiometer etc. including strain gauge	- -		

19.	Experimental Kit/ Teaching Modules/ Training boards/ Learning kits. of relevant subject.	2* + 30	3* + 40		--	
20.	Component Storage rack	2	2		--	
21.	Consumable Items	LS	LS		--	
22.	Miscellaneous	LS	LS		--	

Total Money Required :-

    NOTE:- * Represents the quantiy of learning kits/teaching module. This item is more costly as compared to training boards/ experimental kits etc.

                                        Principles of Digital Electronics
Lab.)
                                        Microprocessors And Applications
Lab.)

S.No. Total No. Recommended Intake 45	Name of the Equipment/ Board/Kit Etc.	Rate per Piece @ Rs.	Total Cost Intake 30	Intake 45	Principles of Digital Eltx. Lab. Intake 30	Intake 45	Micropro-cessors & Application Lab. Intake 30	Intake 45	Total Intake 30	Intake 45
1. 1	CRO dual trace with delayed time base, 25 MHz or higher band width.	25000	25000	25000	1	1	-	-	1	1
2. 2	CRO dual trace 15 MHz.	15000	15000	30000	1	2	-	-	1	2
3. 4	CRO dual trace 10 MHz.	10000	30000	40000	2	2	1	2	3	4
4. 3	Multimeter, 20 K Ohm/volt sensitivity, 1% accuracy in D.C. voltage range, Max. D.C. voltage range 2500 V, A.C Current.	2500	5000	7500	2	3	-	-	2	3
5. 5	Multimeter,Digital hand held 3 1/2 digit, 0.3% accuracy 1000 V D.C. and 20 m ohm resistance range protected	2000	6000	10000	2	3	1	2	3	5

No.	Description									Rate	Amount	
	against transients.											
6.	Logic Probe	15	18	5	7	20	25	20	25	300	6000	7500
7.	Logic board/trainer including +5 Volt, 1Amp + 15 V, 0.3 Amp. power supply and bread board and flexible leads.	10	14	-	-	10	14	10	14	3500	35000	49000
8.	Microprocessor trainer kits with 8085 system (EC 85 or similar).	-	-	8	10	8	10	8	10	8000	64000	80000
9.	Component rack 144 tray (small) & 24 large tray.	2	2	1	1	3	3	3	3	5000	15000	15000
10.	Consumable material such as components ICs, resistors transistors etc.	LS	LS	LS	LS	LS	LS	LS	LS	--	50000	60000
11.	Miscellaneous	LS	LS	LS	LS	LS	LS	LS	LS	--	40000	45000

ELECTRONICS WORKSHOP AND PROJECT LABORATORY

Electronic Instruments and Measurements Lab.

S.No.	Name of the Equipment/ Board/Kit Etc.	Electronics Work-Shop		Electronics Inst. & Measurements Lab		Total		Total Recommended		Rate per Piece In Rs.	Total Cost	
		Intake 30	45	Intake 30	45	Intake 30	45	Intake 30	45		Intake 30	45
1.	D C Voltmeter (1K/2K/10K/20K Ohm per Volt)	–	–	4	4	4	4	4	4	200	800	800
2.	Gen.purpose multimeter	2	3	2	3	4	6	3	4	1000	3000	4000
3.	Electronic multimeter	2	3	3	4	5	7	3	5	2500	7500	15000
4.	IC regulated power supply 0-15 V; 1 A	1	1	2	3	3	4	2	3	1500	3000	4500
5.	Transistor power supply 0-30 V / 1 A variable.	1	1	1	2	2	3	2	2	2000	4000	4000

No.	Item											
6.	Unregulated power supply 0-30 V; 1 A	1	1	1	1	2	2	1	1	1000	1000	1000
7.	A.F. signal generator.	2	3	4	5	6	8	3	4	1500	4500	6000
8.	RF signal generator	2	3	5	6	7	9	4	5	2500	10000	12500
9.	Function Generator	1	2	1	2	2	4	1	2	3000	3000	6000
10.	Std. Signal Generator	2	3	1	1	3	4	1	2	5000	5000	10000
11.	AC/DC Voltmeter (M.I.type)	-	-	2	4	2	4	2	4	200	400	800
12.	Sensitive multirange ammeter	-	-	1	2	1	2	1	2	500	500	1000
13.	Calibrated CRO (Single beam 10 MHz)	-	-	1	2	1	2	1	2	15000	15000	30000
14.	Dual trace Cal. CRO 10 MHz	1	2	2	3	3	5	2	3	20000	4000	6000
15.	Q Meter	-	-	1	2	1	2	1	2	5000	5000	10000
16.	RLC/Universal Bridge	-	-	1	2	1	2	1	1	4000	4000	4000
17.	Universal Digital Freq. Counter	-	-	1	2	1	2	1	1	10000	10000	10000
18.	Distortion Factor Meter	-	-	1	1	1	1	1	1	6000	6000	6000

S.No.	No. Recommended Intake 30	45	Rate per Piece In Rs.	Name of the Equipment/ Board/Kit Etc.	Total Cost Intake 30	45	Electronics Work-Shop Intake 30	45	Electronics Inst. & Measurements Lab Intake 30	45	Total Intake 30	45	Total Recommended Intake 30	45
19.			1000	Decade Resistance Box	1000	1000	–	–	1	2	1	2	1	1
20.			1500	Decade Cap. Box	1500	1500	–	–	1	2	1	2	1	1
21.			200	Std. Inductance (Diff. Value)	800	1200	–	–	4	6	4	6	4	6
22.			--	Charts, Models, displays for safety/rules etc.	2000	2000	LS	LS	–	–	LS	LS	LS	LS
23.			4000	Digital Multimeter	8000	16000	1	2	3	3	3	5	2	4
24.			1500 av.	Single Phase Variac 5 Amp, 15 Amp (Oil/Air cool)	7500	9000	4	5	1	2	5	7	5	6

No.	Item											
25.	Gen. Purpose CRO; 5 MHz.	1	2	-	-	1	2	1	1	10000	10000	10000
26.	Tools Kit	10	15	-	-	10	15	8	10	500	4000	5000
		SET	SET			SET	SET	SET	SET			
27.	Misc. Active Components	LS	LS	-	-	LS	LS	LS	LS	--	8000	10000
28.	Misc. Accessories as per req.	LS	LS	-	-	LS	LS	LS	LS	--	2000	3000
29.	Misc. Passive components.	LS	LS	-	-	LS	LS	LS	LS	--	3000	4000
30.	Working Models of analog and digital equipment	LS	LS	-	-	LS	LS	LS	LS	--	5000	8000
31.	Dark room with Camera,Enlarger, Developing setup, Fixing & Printing setup etc.	LS	LS	-	-	LS	LS	LS	LS	--	50000	50000
32.	Manual Etching Setup	LS	LS	-	-	LS	LS	LS	LS	--	3000	4000
33.	Mechanised Etching Setup	LS	LS	-	-	LS	LS	LS	LS	--	5000	5000
34.	Silk-Screen Printing Setup	LS	LS	-	-	LS	LS	LS	LS	--	5000	5000
35.	Drill Machine with stand	1	2	-	-	3	5	2	3	2000	4000	6000
36.	Misc. Items	LS	LS	-	-	LS	LS	LS	LS	--	40000	60000

```
    37.| Consumable(Not specified above)| LS    LS  |LS  LS  |LS    LS  |LS
LS |      -- | 15000      25000 |
        |                          |          |          |          |
 |         |                 |

        ----------------------------------------------------------------------
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LIST OF EQUIPMENTS

Only those of the equipments given below which are essentially required for the conduction of practicals mentioned in the curriculum are to be procured by the institutions.

"Machine/Equipments/Instruments of old BTE list which are not included below are to be retained in the Lab/Shop for Demonstration purpose but not to be demanded fresh for purchase."

NOTE : Equipment for different shop and lab of latest verson should be purchased.

APPLIED PHYSICS LAB

S.No.	Name of Equipment	No.	@ Rs.	Amt.in Rs.
1.	Brass ball with hook 2 cm. dia	2	20	40
2.	Stop clock least count 0.1 Sec	2	500	1000
3.	Wall bracket with clamping arrangement	2	50	100
4.	Meter scale	5	20	100
5.	Convex lences of focal length 10 cm.,20 cm., 50 cm.and 100 cm. 2 nos. of each	8	10	80
6.	Optical bench steel with pin and lence holders	2	500	1000
7.	Anstronomical telescope	1	500	500
8.	Searl's conductivity apparatus with copper & steel rods 25 X 4 cm. diameter with all accessaries	1 set	1000	1000
9.	Lea's conductivity app. complete with all accessaries	1 set	1000	1000
10.	Constant water flow arrangement	2	400	800
11.	Boiler made of copper 2 lt. cap.	4	200	800
12.	Platinum resistance thermometer	2	800	1600
13.	Potentiometer - 10 wires with jocky	1	500	500
14.	Meter bridge complete	1	250	250
15.	Lead accumulator 2.2 V. and 20 amp. hour capacity	2	250	500
16.	Moving coil galvenometer	3	200	600
17.	Moving coil ammeter 0-1 amp., 0-5 amp., 0-10 amp., 1 no of each	3	250	750
18.	Moving coil voltmeter 0-1 V. 0-5 V., 0-10 V. 1 No of each	3	250	750
19.	Lechlanchi cell complete	3	100	300
20.	Resonance col. of steel tube with			

```
       tuning forcs and other accessaries 1        500      500
21.  Tuning forcs set of different
     frequencies                      1 set    1000     1000
22.  App. for determining coefficient
     of friction on a horrizontal plane 1 set  1000     1000
23.  Appratus for determining character-
     stics of P-N junction diode complete
     with all accessaries             1 set    1500     1500
24.  Post office box dial type        1        1200     1200
25.  Resistance box 0-10 ohm., 0-100
     ohm. 2 nos. each                 4         400     1600
26.  Rehostat of different ohm.capacity 8       250     2000
27.  Physical balance with weight box  2        800     1600
28.  Set of fractional weights        10         20      200
29.  Fortin's barometer with mercury   1       2500     2500
```

```
-----------------------------------------------------------------
S.No.Name of Equipment                  No.       @ Rs.  Amt.in Rs.
-----------------------------------------------------------------
30.  Battery  eleminator 6 V. & 3 amp.  1         250      250
31.  Lab tables                        3        8000    24000
32.  Lab stools                       10         100     1000
33.  Anemometer cup type               1        1000     1000
34.  Anemometer hand held              1        1000     1000
35.  Suryamapi                         1        1500     1500
36.  Insolation meter                  1        1500     1500
     Misc.                        Lum Sum                 5000
```

ELECTRICAL ENGINEERING LAB

```
_____
Sl. No.          Equipment                       Qty.  Price
_____

1.   Ammeter -dynamometer type
     portable, moving  coil, permanent
     magnet 150 mm uniform scale
   a. Range 0 - 2.5 - 5 Amp.                        2    1200
   b. Range 0 - 50 m A                              1     500
   c. Range 0 - 500 mA                              2    1000

2.   Ammeter - moving iron type
     Portable moving iron permanent
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          magnet, 150 mm uniform scale
    a. Range 0 - 5 Amp.                         2    1000
    b. Range 0 - 10/20 Amp.                     2    1000
    c. Range 0 - 500 mA/1000 mA                 2    1000

3.    Voltmeter dynamometer type
      portable moving coil permanent
      magnet 150 mm uniform scale
    a. Range 0 - 5/10 V                         2    1000
    b. Range 0 - 15/30 V                        1    1000
    c. Range 0 - 50 mv/100 mv                   1    1000
    d. Range 0 - 125/500 V                      1    1000
    e. Range 250/500 V

4.    Digital multimeter                        1    3000
      3.5 digit - display
      D.C. voltage 0 - 1000 V in 5 steps
      A.C. voltage 0 - 750 V in 5 steps
      Resistance 0 - 20 M ohm in 6 steps
      D.C. 0 - 10 A in 6 steps
      A.C. 0 - 10 A in 6 steps
      Power supply 9 V.

5.    Analog multimeter (Portable)              1    1000
      D.C. Voltage 0 0 1000 V
      AC Voltage 0 2/5/10/25/100/250/1100 V.
      Resistance 0 200 M ohm
      DC 0 - 50 micro Amp./1 mA/10 mA/100mA/1A/10A
      AC 0 - 100 mA/1A/25 A/10A

6.    Wattmeter single phase (LPF= 0.2)         2    5000
      portable dynamometer type, scale 150 mm
      current range 0 - 5/10 Amps
      voltage Range 0 - 250/500 V

7.    Decade resistance box                     1    1000
      constantan coils, single dial
      10x10, 10x100, 10x1000, 10x10,000 ohms

8.    Continuously variable 0 - 1000 micro      1    1000
      farad, 250 V
```

Sl. No.	Equipment	Qty.	Price
9.	Energymeter single phase induction type, industrial grade 5 A or 10 A, 250 V, 50 Hz.	1	2000

10.	Energymeter(Substandard) single phase, induction type 5 A/10A, 250 V, 50 Hz.	1	3000
11.	Power factor meter dynamometer type, eddy current damping, 50 Hz, scale length 150 mm range upto 20 amp, voltage range 300 V 10 F. range 0.5 log, unity 0.5 load.	1	5000
12.	Frequency meter (Reed type) 230 V, range for having 21 reeds for 40-60 Hz range.	1	500
13.	Rheostat sliding rheostats wound with evenly oxidised iron free nickel copper on vitreous enamelled round steel tube 150 ohms 2 Amps. 110 ohms 2.5 Amps.	1 1	600 600
14.	Variable inductor single phase, 250 V, 2.5 KVAr continuously variable	1	2000
15.	Battery charger 12 V silicon bridge rectifier AC input 230 V, DC output suitable for charging 6 V And 12 V batteries provided with MC voltmeter 0 - 20 V and ammeter 0 - 5 A	1	1000
16.	Capacitors 2.5 microfarod, electrolytic type	4	200
17.	Q Meter frequency 0 - 30 MHz Q 0 to 500	1	4000
18.	LCR meter (digital) 3.5 digit display capacitance 0 to 20,000 microfarad inductance 0 to 200 Henry resistance 0 to 20 M ohms	1	8000
19.	LCR/Q bridge capable of measuring resistance, inductance and capacitance of range 8 amps, 0.012 to 10 M ohms, 4 to 10,000 H, 0.5 pico farad to 10 F.	1	5000

Sl. No.	Equipment	Qty.	Price
20.	Kelvin double bridge 10 x 0.1 ohms circular slide wire devided into 200 equal parts		
21.	Energy meter 3 phase induction type, 4 wire, industrial grade, 50 Hz, 10 A, 440 Volt	1	5000
22.	Energy meter (Sub standard) 3 phase, 4 wire, 440 V, 10A, 50 Hz induction type.		
23.	Transformer single phase core type, 230/110 V, 1 KVA, 50 Hz.	1	5000
24.	Universal shunt 0 - 75 A	1	2000
25.	Current transformer 10/25/50/5A as per IS 4201/1967 and 2705/1981	1	2000
26.	Potential transformer 10 VA, 415/110 V as per IS 4201/1967 and 2705/1981	1	2000
27.	Maxwells bridge	1	1000
28.	Laboratory D.C. power supply (220 V) static converter input from 3 phase 50 Hz, 415 volts A.C., output rating of 200 vatts to 260 watts, 50 amps, continuously varibale.	1	50,000
29.	Watt meter 3 phase induction type 2 element voltage range 0/300/600 V current range 0/5/10 A	1	2000
30.	Frequency meter - portable (Reed type) 45-55 Hz with 21 reeds	1	2000
	Frequency meter digital portable 3.5 digit LED display range 20-99 Hz	1	2000
31.	Phase sequence indicator (Rotary) 3 phase, 415 V, 50 Hz	1	1000
32.	Phase sequence indicator (Indicating type)	1	1000

3 phase, 400 V, 50 Hz

33.	Galvanometer centre zero response time 1.8 sec.	1	1000
34.	VAR meter 1/5 A, 300/600 V	1	2000

Sl. No.	Equipment	Qty.	Price
35.	Wire wound rheostats		
	15 ohms, 10 A	2	1200
	100 ohms, 5 A	2	1200
	250 ohms, 5 A	2	1200
	1000 ohms, 0.5 A	2	1200
	2500 ohms, 0.1 A	2	1200
36.	Stop watch least count 0.01 Sec.	2	2000
37.	Stop watch (digital) LED	2	2000

COMPUTER CENTRE

S.No.	DESCRIPTION	QTY.	APPROX. COST (in Rs.)
1	Latest Version-Core-2 Dual Processor 2 MB L2 Cache, 2.4 Ghz ofr Higher 1 GB DDR2 RAM,160 GB SATA HDD,72K RPM MONITOR COLOUR 17" TFT DVD Writer, Multi Media Kit with Speaker & Microphone FDD - 1.44 MB Key Board - Multimedia Mouse - Optical Scrool Fibre Mouse 32 Bit PCI ETHERNET CARD(10/100) Mbps Internal Modem, Pen Drive 2GB, Blue Tooth Pre loaded Windows XP/2000/VISTA Pre loaded latest Anti Virus with licence media and manual with UPS 660 VA	62	20,000,00=00 (60+2Server)

OR

Computer of latest Specification

```
2.    Lap Top (Latest Version)            04              300000.00

3. Software :(With Licence)

        i     WINDOWS - XP/2000/VISTA
        ii    ORACLE 9i or Latest Windows based
              20 USERS)  & Development (Latest)
        iii.  VISUAL STUDIO (professional)
        iv.   MS OFFICE XP
        v.    COMPILER    -       'C',C++, JAVA
        vi.   Unix & Linux
        vii.  Front Pange, Internet Explorer,Page Maker
              Corel Draw, Dream Weaver
        viii. Personal Web Server, HTML, IIS
        ix.   Tally


3. Hardware

     i. Switch-16,8,24 Port                    100000.00
        all accessories related to Networking.
     ii.Scanner- A4/Auto lighter Scanner     02  25000.00
4.    132 Column 600 CPS or faster           02  50000.00
      9 Pin dot matrix printer with
      500 million character head     life
5.    Laser Jet-A4,All In One (2 Each)       04  70000.00
6.    Desk Jet-A4, Photo Smart(2 Each)       04  40000.00
7.    5 KVA on line UPS with minimum         04 400000.00
      30 miniute battery backup along
      with sealed maintenance free
      batteries. Provision for connecting
      external batteries with network
      connectivity. (For 2 Labs)
7.    Split   Air  Conditioner 1.5  tones    08 300000.00
      capctity with ISI mark alongwith
      electronic voltage stablizer with
      over voltage and time delay circuit
8.   Room preparation and furniture       LS
9.   Cat-6 cabling for network            LS
10.  2 KVA Inverter Cum UPS               02   50000.00




11. Digital Camera                        01   25000.00
14.  Fire Extinguisher (2 Kg.)            04   15000.00
16.  Fire Extinguisher (5 Kg.)            04   30000.00
17.  Vaccum Cleaner                       02   15000.00
18.  LCD Projector                        02  200000.00
19.  Pen drive 1GB, 2GB, 4 GB             10   15000.00
20.  DVD writer External                  02    5000.00
21.  HDD External 160 GB                  02   10000.00
22.  PDA (Latest Configration)            02   10000.00
23.  Broadband For Internet(Speed Min. 8mbps)  04
24.  USB Modem                            02   10000.00
25.  Generator 10 KVA Water Coolent       01  100000.00
```

NOTE : All the above items should be equally distributed in the 2
computer centres

HARDWARE MAINTENANCE & PROJECT LAB

S.No.	Descirption	Qty.	Approximate Cost.
1.	Digital Multimeter	12	24,000
2.	Power Supply	10	30,000
3.	Latest Version-Core-2 Dual Processor 2 MB L2 Cache, 2.4 Ghz or Higher,1 GB DDR2 RAM,160 GB SATA HDD, 72K RPM, CD/DVD Drive	10	400000
4.	Printer (600 cps) a) Dot Matrix b) Desk Jet c) Laser	2 Each	100000
5.	Constant Voltage Transformer	4	32,000
6.	PC Card Sets (One Mother Board, 4 Cards)	2	20,000
7.	Spike Buster	10	5,000
8.	Tool Kit	10 Set	50000

7.   LEARNING RESOURCE MATERIALS

1.   Overhead Projector with screen   1   --   20000

2.	35 m.m. Slide cum Film Projector	1	--	50000
3.	Audio Cassette Recorder	1	--	15000
4.	V.C.R. with Monitor & Accessories	1	--	35000
5.	Photography Camera for Production of slide and film strips, 35 mm still camera dark room equipment.	1		100000
6.	Cutting, Binding & Stitching equipment.	1	--	30000
7.	L. C. D. Projector	1	--	400000

ANNEXURE-QUESTIONNAIRE

INSTITUTE OF RESEARCH,DEVELOPMENT AND TRAINING U.P.KANPUR -208024

SUBJECT: Questionnaire for ascertaining the job potential and
          activities of diploma holder in Computer   Science
          (Semester System).

PURPOSE: To design and develop Three   Year (Six Semester)
          diploma   curriculum in Computer Science (Semester
          System).

NOTE: 1.Please answer the questions to the points given in
          the questionnaire.
          2.Any other point or suggestion not covered in this
          questionnaire may be written on a separate paper and
          enclosed with the questionnaire.

1.Name of the organisation:_____
                           _____

2.Name & Designation of the officer _____
  filling the questionnaire   _____

3.Name of the department/section/   _____
  shop   _____

4.Importent functions of the   _____
  department/section/shop   _____

5.Number of diploma holder employees
  under your charge in the area of   _____
  Computer Science.

6. Please give names of modern equipments/machines handled by a diploma holder in Computer Science.

    1.   2.   3.

    4.   5.   6.

7. What proficiencies are expected from a diploma holder in Computer Science.

    1.   2.   3.

    4.   5.   6.

8. Mention the approximate percentage of the following desired in Diploma teaching.

    1. Theoretical knowledge   -------------%

    2. Practical knowledge   -------------%
    3. Skill Development   ------------%

9. Do you think " on the job training" / Industrial training should form a part of curriculum.   (Yes/ No)
    if yes then
    (a) Duration of training   --------------
    (b) Mode of training   1. Spread over different semesters

                               2. After completion of course

                               3. Any other mode

10. What mode of recruitment is followed by your organisation.

    1. Academic merit
    2. Written test
    3. Group discussion
    4. Interview
    5. On the job test.

11. Mention the capabilities/ Qualities looked for while recruiting diploma holder in Computer Science.
    (a) Technical knowledge   ------------
    (b) Practical skill   ------------
    (c) Etiquettes and behaviour   ------------
    (d) Aptitude   ------------
    (e) Health, habit and social background --------------
    (f) Institution where trained   --------------

12. Does your organisation have   Yes/No

any system for the survey of Home
articles of different countries/States.

13. Does your organisation conduct field   Yes/No
    survey to know users views regarding.
      1. Home Articles for different
         age groups and sex.
      2. Effect of climatic conditions
      3. Any other
         If yes ; Please give brief account of each.

14. Which type of assignment do you suggest for an entrepreneur
     in Computer Science.

15. In which types of organisations can a diploma holder in
     Computer Science can work or serve.

     1   2   3

     4   5   6

16. Job prospects for the diploma holder in Computer Science the
     next ten years in the state / country.

17. In your opinion what should be the subjects to be taught to a

     diploma student in Computer Science.

      Theory   Practical
18. Kindly mention particulars regarding topics/areas which
     should be given more emphasis in the curriculum .

       Theory   Practical

19. Kindly state whether your organisation   Yes/ No
     can contribute towards improvement of
     curriculum in above field.
     If yes : Please give names of experts in
     your organisation to whom contact.

20. Kindly give your valuable suggestions for being
     considered at the time of finalisation of curriculum.

21. What changes in technologies are to be incorporated
     in the development of curriculum in Computer Science.

(Signature)

Kindly mail the above questionaire duly filled to:-

     R. P. Alam
     Assistant Professor
     Institute of Research,Development & Training,U.P.
     Kanpur-208024
(Please note that all information in this survey is confidential
for the use of curriculum design only)

ANNEXURE- 2 FIELD EXPOSURE SCHEDULE

All the students of second year after annual examination will undergo in industrial training for a period of four week in Industries dealing with computers. It will in all respect end by the end of summer vacation. It will be arranged and supervised by institute staff . The performa for preparing a report of his stay. There in the industry given below can be taken as a guide for the purpose.

1. Name & Address of the organisation

2. Nature of the industry and its activity.

3. Date of

    i. Joining

    ii. Leaving

4. Details of the sections of the industry visited.

    i. Name of tools, equipments instruments in use.

    ii. Activities of the section

    iii. Study of the components, devices used in complete assemblies.

    iv. Soldering and de-soldering techniques used in circuit fabrication.

v. Study of PCB Lay out developing and preparation.

vi. Checking and testing of the components used.

vii. Final checking of the product.

viii. Discription of quality control measures taken in industry.

_____
_____