



GOVT.TOOL ROOM & TRAINING CENTRE

SEMESTER: SECOND

Course: DIPLOMA IN TOOL & DIE MAKING

Syllabus -Theory and practical Subjects

Course: 1. DIPLOMA IN TOOL & DIE MAKING

SL. NO	CODE	SUBJECTS	Contact Hours/Week	Contact Hours/Semester
1	DTDM-IIS201	Production Technology – II (Turning)	3	64
2	DTDM-IIS202	Engineering Mathematics –II	3	64
3	DTDM-IIS203	Basic Electrical & Electronics	3	64
Practical				
4	DTDM-IIS204	Engineering Drawing –II	4	94
5	DTDM-IIS205	Basic Computer Application Lab	3	64
6	DTDM-IIS206	Work Shop – II	24	450

Scheme of Examination

Course: DIPLOMA IN TOOL & DIE MAKING

Sl. No	Sub. Code	Subjects	Contact Hours per Week	Exam Duration	Scheme of Examination				Total Marks	Min marks for passing
					Exam		Internal Assessment			
					Max	Min	Max	Min		
					Marks	Marks	Marks	Marks		
1	DTDM-IIS201	Production Technology – II (Turning)	3	3	100	50	20	10	120	60
2	DTDM-IIS202	Engineering Mathematics –II	3	3	100	50	20	10	120	60
3	DTDM-IIS203	Basic Electrical & Electronics	3	3	100	50	20	10	120	60
Practical										
4	DTDM-IIS204	Engineering Drawing –II	4	4	100	50	20	10	120	60
5	DTDM-IIS205	Basic Computer Application Lab	3	3	100	50	20	10	120	60
6	DTDM-IIS206	Work Shop – II	24	10	900	540	100	60	1000	600
Total			40	---	1700	940	260	140	1960	1080

PRODUCTION TECHNOLOGY-II

SUBJECT CODE: DTDM-IIS201

Contact Hrs./Week: 3

Contact Hrs. / Semester: 64

- 1. General safety**
 - Safety precautions
- 2. Shaping Machines**
 - different types
 - main parts
 - controls
 - driving mechanism
 - quick return motion
- 3. Cutting Tool - Shaper**
 - tool geometry
 - roughing tools
 - grooving tools
 - side tools
 - bent tools
 - T-Slot tools
 - Finishing tool
- 4. Work holding devises**
 - Machine vice
 - Direct tables
 - Chucks
 - Collects
 - Centres
 - Face plates
 - Mandrels
 - Steady rest
- 5. Cutting speeds & feeds**
 - Work piece material
 - Tool material
 - Design of machine
 - Using tables
- 6. Calculation of machining time**
 - Length of Jobs
 - Feed per stroke speed
 - Cutting stroke
 - Return stroke speed
- 7. Safety**
 - Rules & regulations
- 8. Lathe Machines**
 - Types
 - main parts

9. Work holding devises

- Chucks
- Collects
- Centres
- Face plates
- Mandrels
- Steady rest

10. Turning tool Geometry

- HSS
- Carbide
- Ceramic
- Roughing tool
- Finishing tool
- Plain turning tool
- Threading tool

11. Tool holder

- Holder for tool bit
- Tool post
- Clamping plate
- Four way tool post

12. Turning operation

- plain
- Step
- Parting
- Boring
- Grooving
- Facing
- Threading
- Profile
- Drilling
- Tapping
- Reaming
- Counter boring
- Eccentric turning
- Copy turning

13. Taper turning methods

- Offset tail stock
- Taper turning attachment
- Effect tool position
- Taper calculation

14. Thread Cutting

- Gear setting
- Metric threads
- lead screw
- inch threads from metric lead screw
- Threading dial
- Right & left hand threads
- External & Internal threads

15. Cutting Speed

- Length in m/min
- Material of work Piece
- Tool material
- Cross section of chips
- Cooling
- Design of machine

16. Calculation of R.P.M.

- Cutting speed
- Diameter of work piece

17. Feeds & depth of cut

- Material
- Cutting tools
- Cutting angles
- Feed in mm/revolution

18. Calculation of machining time

- Setting time
- Machine time
- Auxiliary time
- Delay time
- Total time

19. Safety

- Rules & regulations

Reference Books

1. Workshop Technology – S.K.Hazra Chowdhary
2. Production Technology – R.K. Jain
3. Basic Shop theory - Chapmen

ENGINEERING MATHEMATICS-II

SUBJECT CODE: DTDM-IIS202

Contact Hrs. /Week: 4

Contact Hrs. / Semester: 64

SPECIFIC INSTRUCTIONAL OBJECTIVES:

1.0 ANALYTICAL GEOMETRY

10 Hrs

- 1.1 Define margin, co ordinate axes.
- 1.2 Define Abscissa & Ordinates of a point.
- 1.3 Obtain equation for the distance between two points in terms of coordinate.
- 1.4 Using the distance formula to find the distance between the two points.
- 1.5 Problems of the following type:
 - a) Find distance between the given points
 - b) S.T.the given points are collinear
 - c) S.T.the given 3 points from the vertices of a triangle
 - d) S.T.the given 4points form the vertices of a parallelogram, rectangle, square, rhombus, etc
- 1.6 Explain the section of a straight line.
- 1.7 Derive section formulae for Internal &External division.
- 1.8 writes formulae for midpoint of a line.
- 1.9 Solve problems on Internal External Division.
- 1.10 Derive Area of a triangle formed by the given points.
- 1.11 Examples of co-ordinates of the centroid of a triangle.
- 1.12 Find the area of the Quadrilateral formed by the given points etc.

2.0 LIMITS

8 Hrs

- 2.1 Define independent , dependent variable & constants with examples
- 2.2 Define a function
- 2.3 List type of function
- 2.4 Define
 - 1) Direct & inverse function
 - 2) Explicit & implicit function
 - 3) Odd & even function with examples
- 2.5 Define limit of a function
- 2.6 Theorems on limits
- 2.7 Solve problems on limits of a function by factorization
- 2.8 Solve problems on limits of a function by rationalization
- 2.9 Solve problems on limits of a function when X tends infinity
- 2.10 Deduce
 - 1) $\lim_{x \rightarrow a} \frac{x^n - a^n}{x - a} = na^{n-1}$ for any rational number (no proof)
 - 2) $\lim_{\theta \rightarrow 0} \frac{\sin \theta}{\theta} = 1$ where θ is in radians (statement only)
- 2.11 Solve problems on above results

3.0. DIFFERENTIATION

12 Hrs

3.1 Definition of differentiation

3.3 *Derive differentiation of a functions from first principle method x^n , $\sin x$, $\cos x$ with respect to x*

3.4 State derivative of e^x and $\log x$

3.5 State rules of differentiation

1) Derivative of sum

2) Product & quotient of function

3.6 Solve problems on rules of differentiation

3.7 Obtain the derivatives of a function of function (chain rule)

3.8 Inverse trigonometric functions

3.9 Implicit functions & parametric functions

3.10 Solve problems on above types

3.11 Carry out logarithmic differentiation

3.12 Solve simple problems of the type x^n , a^x , $x^{\sin x}$, $x^{1/x}$ etc.,

3.13 Obtain the 2nd derivative of a function

4.0 INTEGRAL CALCULUS

12 Hrs

4.1 Definition of integration as anti-derivative

4.2 List of standard integrals

4.3 State rules of integration

4.4 Solve the problems on rules of integration

4.5 Explain integration by substitution method

4.6 Solve simple problems on substitution method

5.0 DEFINITE INTEGRALS

10 Hrs

5.1 State $\int_a^b f(x)dx$ as a definite integral.

5.2 Explain definite integrals as a limit of sum(statement)

5.3 Write the formulae for finding area, volume of a function.

6.0 COMPLEX NUMBERS

8 Hrs

6.1 Definition

6.2 Real and Imaginary parts of a complex number

6.3 Conversion from one form to other

6.4 Conjugate of a complex number.

6.5 Addition, subtraction, multiplication and division of a complex number.

Contact Hrs./Week: 4

Contact Hrs. / Semester: 94

ENGINEERING DRAWING –II

SUBJECT CODE: DTDM-IIS204

Learning goals for Engineering Drawing

On completion of this subject, the trainees will be able to:

- Prepare the detail drawings with the help of the given assembly drawings.
- Prepare the assembly drawing with the help of the given detail drawings.
- Prepare the bill of materials.
- Decide dimensions for all mating parts.
- Interpret special views.
- Interpret the symbols for surface finish.
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SPECIFIC INSTRUCTIONAL OBJECTIVES

ENGINEERING DRAWING –II

I - REVIEW

1 .Review	Lines, Lettering, Angle of Projection & Types of Sectioning
2.Auxillary Views	What is as auxiliary view? When to choose auxiliary views?
3.Auxillary Views (Continued)	Extra Exercise from reference books
4.Developments of Solids	Introduction, , Development of Cubes, Calculations & Related Practice
5.Developments of Solids	Development of Prisms, Calculations & Related Practice
6.Developments of Solids	Development of Cylinders, Calculations & Related Practice
7.Developments of Solids	Development of Pyramids, Calculations & Related Practice
8.Developments of Solids	Development of Cones, Calculations & Related Practice
9.Surface Roughness	What is surface roughness? Symbols used for indication. Indications added to the symbols, Eg: (Direction of Lay). Details of the characteristics, Eg: (Roughness Grade)

II Preparation of Assembly drawing, detail drawing & part list

1. Screw jack
2. Pipe vice
3. Tool Maker's Clamp
4. Mini Vice
5. Universal Coupling
6. Tennon & Fork

Reference Books

- 1 Elementary Engineering drawing : N.D.Bhatt
- 2 Engineering Drawing : K.R. Gopal Krishna
- 3 Fundamentals of Engineering drawing : R.K. Dhawan
- 4 Engineering Drawing : I.S. Morris
- 5 Step by step Engineering drawing : Vee Ess
- 6 Engineering graphics : Verges
- 7 Engineering drawing by Venugopal

BASIC ELECTRICAL & ELECTRONICS

SUBJECT CODE: DTDM-IIS203

Contact Hrs./Week: 3

Contact Hrs. / Semester: 64

1. Basics of electricity

- 1.1 Definition of electric current, emf, electric potential,
- 1.2 Potential difference, ohm's law , specific resistance,
- 1.3 Simple problems limitations of ohms law,
- 1.4 Series parallel circuit.
- 1.5 Kirchoff's current law and voltage law, discuss power,
- 1.6 Energy & units.

2. Conductor & Insulators

- 2.1 Definition of conductors & insulators , properties examples
- 2.2 Semi-conductor materials Ge & Si atomic structure, doping,
- 2.3 Trivalent & pentavalent donors and acceptors.
- 2.4 N & P type semi-conductors, intrinsic & extrinsic
- 2.5 Semiconductors, energy level, PN junction diode.
- 2.6 Transistors, types of transistors & characteristics of transistors.

3. Electromagnetic Induction

- 3.1 State faradays laws & Lenz's laws. Definition of flux,
- 3.2 Mmf, reluctance, absolute permeability, self inductance,
- 3.3 Mutual inductance.
- 3.4 Mutual inductance, expression for energy stored in a inductor,
- 3.5 Inductance in series & parallel, coefficient of coupling,
- 3.6 Inductive reactance & definition of quality factor.

4. AC Fundamentals

- 4.1 Define amplitude, peak value, cycle, frequency, time period,
- 4.2 Phase with respect to sine wave, phase difference leading & Lagging phase shift.
- 4.3 Expression for rms value, average value. Discuss form factor,
- 4.4 Peak factor simple problems.

5. Digital Electronics

- 5.1 Introduction, decimal system, binary system & octal system
- 5.2 Hexa decimal system

6. Transformers

- 6.1 Study of principle of operation of transformer,
- 6.2 Emf equation, turns ratio, voltage transformation,
- 6.3 Ratio, losses of transformer, efficiency, regulation.
- 6.4 Construction of power transformer, classification of
- 6.5 Transformer, based on core.
- 6.6 Frequency, auto transformer, uses of isolation transformer.
- 6.7 RFT, AFT, & Pulse transformer.

7. Batteries & Relay & Motors

- 7.1 Definition of cell, primary & secondary cell, will suitable
- 7.4 Discuss precaution to be taken in battery maintenance,
- 7.5 Various types of batteries used in ups & electronic equipment
- 7.6 Working principle of electromagnetic relay,
- 7.7 Classification of relays based on the principle of operation, polarization & application
- 7.8 List the contact materials used in relays & list their
Characteristic principle of operation of dc motors, stepper & Dc generators.

8. Passive components

- 8.1 Resistors, specification of resistors, ohmic value, and tolerance Power rating & thermal stability.
- 8.2 Constructional features of carbon composition, metal film & Wire wound fixed resistors.
- 8.3 Applications of resistors, constructional features
- 8.4 Composition. Linear logarithmic & wire wound potentiometers.
- 8.5 Principle of operation of LDR, VDR, Thermister.
- 8.6 Applications of fixed resistors, pots, rheostats.
- 8.7 Identify the resistance value by colour code & letter code (Bs 1852) method.
- 8.8 Capacitors, classification based on dielectric material.
- 8.9 Constructional features of fixed, variable, capacitor,
- 8.10 Applications of capacitor.

Course : Basic Computer Applications Lab

Course Code: DTDM-IIS205

Contact Hours:64

Prerequisites: Knowledge of Secondary school English comprehensions, Mathematics

Course Objectives: Understand the Basics of Computers and apply the application tools like word processor, spread sheet and presentation.

Course Outcomes:

At the end of the course, the students will be able to:

1. Understand the basic organisation of the computer.
2. Use the different tools and utilities of the operating system.
3. Use: a) word processor b) spreadsheet c) presentation effectively.

Course Contents

Unit – I

1. Identify and understand the various hardware components of a Computer.
2. Study and Practice of Basic DOS Commands.
3. Practice creating Icons and Folders, Creating/Opening of file, Editing and saving the document, Copy, Cut and Paste operations, in-built utilities of OS like – Text editors, paint, calculator, etc.
4. Practice browsing using search engine.
5. Create E-Mail accounts, Sending, Receiving of E-Mails.

Unit –II

Word Processing

1. Create a Business Letter and Personal Letter.
2. Create a Company Letterhead.
3. Create a Simple Newsletter with minimum three columns. Insert a Clip art in the newsletter.
4. Create a Resume for a Job Application.
5. Create the cover page of a Project Report (use Word Art, insert Picture Image).
6. Prepare the class time table for your class.
7. Create an invitation and sent it to all the head of the departments using mail merge

Spreadsheet

1. Create a worksheet with ten columns, each column for Sl. No., Register No., Student Name, and one column for each Course, enter ten student records and find the sum of all columns in rows using sum feature.
2. Create a worksheet containing the pay details of employees (containing Basic pay, DA, HRA, Medical allowance, with Deductions- PF, PT, Insurance) and find Gross and Net salary using formulas.

3. Create a results sheet containing Candidate's Register No., Name, Marks of all subjects, Total Marks, Percentage and Result. Result must be calculated as below:
Distinction if Total Percentage $\geq 70\%$
First Class if Total Percentage $\geq 60\%$ and $< 70\%$
Second Class if Total Percentage $\geq 50\%$ and $< 60\%$
Pass if Total Percentage $\geq 35\%$ and $< 50\%$ provided the candidate has secured at least 35 marks in each Course or Fail otherwise.
4. You have a monthly income of Rs.11000. Your monthly expenditures are Rent- Rs 3500, Food- Rs. 1500, Electricity- Rs.110, Phone- Rs. 160, and Cable TV-Rs. 300. Prepare a worksheet with the Monthly Income, the Monthly Expenditures listed and summed, monthly savings amount (what's left over each month) calculated, and the amount saved per day (assuming 30 days in a month).
5. Create a Simple Bar Chart and Pie Chart to highlight the sales of a company for three different periods, also give different colours and legends

Power Point Presentation

1. Using presentation tool, Create a simple Presentation consisting of 4-5 slides about Input and Output Devices.
2. Create a presentation about a book containing Title, Author, Publisher and Contents.
3. Create an automated (with timings, Transmission & animation) Presentation with five slides about different Models of Computers. Use Presentation tool.

References:

1. Computer Fundamentals Concepts, Systems, Application, D.P.Nagapal, Chand Publication, RP-2014, ISBN: 81-219-2388-3
2. <http://www.tutorialsforopenoffice.org/>
3. <http://www.libreoffice.org/get-help/documentation/>
4. <http://www.kingsoftstore.com/>

Course Delivery:

The course will be delivered through tutorials of one hour and three hours of hands on practice per week.

Note: There is no change in workshop practical syllabus.