

GOVERNMENT POLYTECHNIC, PUNE
(An Autonomous Institute of Govt. of Maharashtra)

Programme : Diploma in CE/EE/ET/ MT/CM/IT
Programme Code : 01/02/03/05/06/07/15/16/17
Name of Course : Basics of Computer Systems
Course Code : CM261

Teaching Scheme:

	Hours /Week	Total Hours
Theory	03	48
Practical	02	32

Evaluation Scheme:

	Progressive Assessment	Semester End Examination			
		Theory	Practical	Oral	Term work
Duration	---	---	2 hrs	---	2 hrs
Marks	---	---	50	---	25

Course Rationale:

In this world of high speed computing, it is essential for diploma in computer engineering students to know about device of computers, its operation and graphical base applications and latest technologies in the market. This course is designed for basic perspective for first year diploma students.

Course Objectives:

- Use computer system effectively.
- Describe and use different application software's.
- Use the basic functions of an operating system.
- Use five essential utility programs.
- Compare major OS like Linux and MS-Windows
- Understand working of input output devices.
- Understand working of secondary storage devices.
- Set the parameter required for effective use of hardware combined with and application software's
- Understand connectivity, internet multimedia and web.

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Course Content:

Chapter No.	Name of Topic/Sub topic	Hrs	Weightage
1	Input and Output		
	1.1 What Is Input?	04	---
	1.2 Keyboard Entry		
	Keyboards		
	1.3 Pointing Devices		
	Mouse, Joystick, Touch Screen, Light Pen, Stylus		
	1.4 Scanning Devices		
	Optical Scanners, Bar Code Readers, Character and Mark Recognition Devices		
	1.5 Image Capturing Devices		
	Digital Camera, Digital Video Camera		
	1.6 Audio-Input Devices		
	Voice		
	1.7 Webcams and Instant Messaging		
	1.8 What Is Output?		
	1.9 Monitors		
	Cathode-Ray Tube, Panel Monitor, Monitors		
	1.10 Printers		
	Features, Ink-Jet Printer, Laser Printer, Thermal Printer, Other Printers		
	1.11 Audio-Output Devices		
	1.12 Combination Input and Output Devices		
	Fax Machines, Multifunction Devices, Internet Telephone, Terminals		
	SECONDARY STORAGE		
	1.13 Storage		
	1.14 Floppy Disks		
	Traditional Floppy Disk, High Capacity Floppy Disks		
	1.15 Hard Disks		
	Internal Hard Disk, Hard-Disk Cartridges Hard-Disk Packs, Performance Enhancements		
	1.16 Optical Disks		

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		Compact Disc, Digital Versatile Disc		
	1.17	Other Types of Secondary Storage		
		Solid-State Storage		
	1.18	Making IT Work for You:		
	1.19	Music from the Internet		
		Internet Hard Drives, Magnetic Tape		
	1.20	Mass Storage Devices		
	1.21	A Look to the Future: Blu-Ray Technology and		
	1.22	Plastic Memory Expected to Replace DVD		
2	The System Unit			
	2.1	Electronic Data and Instructions		
		Binary Coding Schemes		
	2.2	System Board		
	2.3	Microprocessor		
		Microprocessor Chips ,Specialty Processors		
	2.4	Memory		
		RAM, ROM, CMOS		
	2.5	System Clock	02	---
	2.6	Expansion Slots and Cards		
	2.7	Making IT Work for You:		
	2.8	TV Tuner Cards and		
	2.9	Video Clips		
	2.10	Bus Lines		
		Expansion Buses		
	2.11	Ports		
		Standard Ports, Cables		
	2.12	Power Supply		
3.	System Software			
	3.1	System Software		
	3.2	Operating Systems		
		Functions, Features, Categories, Windows Mac OS, UNIX and Linux	04	---
	3.3	Utilities		
		Windows Utilities, Utility Suites		
	3.4	Device Drivers		

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	3.5	Making IT Work for You: Virus Protection and Internet Security		
	3.6	A Look to the Future: IBM Builds an Aware		
4.	Basic	Application Software		
	4.1	Application Software		
		Common Features, Web-based Applications		
	4.2	Making IT Work for You: Speech		
	4.3	Recognition		
	4.4	Word Processors		
		Features, Case		
	4.5	Spreadsheets		
		Features, Case		
	4.6	Database Management Systems		
		Features, Case		
	4.7	Presentation Graphics		
		Features, Case		
	4.8	Integrated Packages		
		Case		
	4.9	Software Suites		
	4.10	Sharing Data between Applications		
		Copy and Paste, Object Linking and Embedding		
	4.11	A Look to the Future: Web-based Application		
	4.12	Software Updates Ease Maintenance		
5.	Information Technology			
	5.1	Internet, and You (Only Introduction)		
	5.2	Information Systems		
	5.3	People		
	5.4	Making IT Work for You:		
	5.5	Information Technology Topics		
	5.6	Software		
		System Software, Application Software		
	5.7	Hardware		
		Types of Computers, Microcomputer Hardware		
	5.8	Data		
	5.9	Connectivity, the Wireless Revolution, and the Internet		

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	5.9	A Look to the Future: Using and Understanding				
	5.10	Information Technology Means Being Computer Competent				
6.	The Internet, the Web, and Electronic Commerce					
	6.1	The Internet and the Web Access Providers, Browsers	04	---		
	6.2	Communication E-Mail, Instant Messaging, Discussion Groups				
	6.3	Making IT Work for You:				
	6.4	Blocking Spam				
	6.5	Search Tools Search Engines, Meta search Engines, Specialized Search Engines				
	6.6	Electronic Commerce Web Storefronts, Web Auctions, Security				
	6.7	Web Utilities Telnet, FTP, Plug-ins, Filters				
	6.8	A Look to the Future:Internet2 Is a High-Performance Network				
7.	Specialized Application Software (only Introduction)					
	7.1	Specialized Applications			02	---
	7.2	Graphics Desktop Publishing, Image Editors, Illustration Programs, Image Galleries, Graphics Suites				
	7.3	Audio and Video Multimedia Links and Buttons, Developing Multimedia Presentations, Making IT Work for You: Digital Video Editing, Multimedia Authoring Programs				
	7.4	Web Authoring Web Site Design, Web Authoring Programs				
	7.5	Emerging Applications Virtual Reality, Knowledge-based (Expert) Systems, Robotics				

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	7.6	A Look to the Future: The Future of Artificial		
8.	Communications and Networks (Only Introduction)			
	8.1	Communications	06	---
		Connectivity, The Wireless Revolution, Communication Systems		
	8.2	Communication Channels		
		Physical Connections, Wireless Connections		
	8.3	Connection Devices		
		Modems , Connection Service		
	8.4	Data Transmission		
		Bandwidth, Protocols		
	8.5	Networks		
		Terms		
	8.6	Network Types		
		Local Area Networks, Home Networks, Metropolitan Area Networks, Wide Area Networks		
	8.7	Network Architecture		
		Configurations		
	8.8	Making IT Work for You: Home Networking Strategies		
	8.9	Organizational Internets: Intranets and Extranets		
		Intranets, Extranets, Firewalls		
	8.10	A Look to the Future: Toyota and Sony Create Wireless Robotic Car		
	9.	Cyber Law & Cyber Security		
	9.1	Introduction to Cyber Security, Security issues related to Information, Internet Security, Data Security and Information Security. Cyber Law associated with violation of security.	02	---
	Total		48	---

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List of Practicals/Experiments/Assignments:

Sr. No.	Name of Practical/Experiment/Assignment	Hrs
1.	Demonstrate types of Computers.	02
	Demonstrate use of various I/O Devices. (Maximum Devices Available in the LAB as per theory should be demonstrated)	
	Functioning of Cathode Ray Tube, TFT/Flat Monitors and other monitors	
	Introduction of interface of other output devices like Fax Machines, Internet phones, Digital Camera etc.	
	Functioning of various types of Audio-Output Devices.	
2.	Functions and working of Secondary Storage devices	04
	Types of Secondary Storage devices.	
	Installation, configuration and setting of Hard Disks.	
	BIOS Settings for Primary and secondary Memory.	
	Installation and working of CD-ROM/DVD-ROM/ DVD-Combo/ DVD-Writer (Internal and External).	
	Future of Secondary Storage Devices.	
3.	Practice of basic commands in command window: Ex: dir, md, copy, cd, move, rmdir, rd etc.	04
4.	Operating System	04
	Various operations on Window based operating system.	
	Windows Operations: Minimising, Maximising, Resizing.	
	Using Windows Help.	
	Creating, copying, moving files and folders.	
	Creating shortcuts.	
	Creating and Removing/Deleting User Accounts.	
	Setting window views.	
	Using Add /Remove Programs Utility.	
	Using Add Hardware Utility	
	Adding Fonts.	
	Viewing Computer Configuration.	
	Desktop settings: Display properties, time and date setting, Screen Saver , Appearance	

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5.	Application software	
	Word Processors	
	Hands on Word Processors.(Ex: MS WORD, OpenOffice.org)	
	Various options and its use in creating/ updating/ printing/ Adding Image/mail merge etc. (Perform at least 5 assignments Covering all menu items). Spreadsheets:	
	Assignments based on use of Spreadsheets & Various menu items and its use in worksheets to solve problems. (Perform at least 5 assignments using any spreadsheet software)	
	Presentation Graphics:	
	Preparation of Various slides (Perform at least 5 assignments covering Presentation Graphics like objects grouping, Customising Slide transition, Embedding Links)	07
6	Database Management System	
	Creation of tables using DBMS tools like MS Access. (Teachers should frame their own assignments for above tools which covers maximum features provided by respective softwares).	07
7.	Introduction to Internet and WWW	
	Conduct minimum 2 assignments on Internet and Web, like creating mail accounts, using web based applications, browsing internet sites to fetch relevant information, etc.	02
	Introduction to e-Commerce and related web sites. Example Railway Reservations, Air Ticket Reservations etc..	02
	Total	32

Text Books:

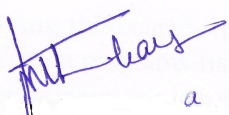
Sr. No	Author	Title	Publication
1.	Timothy J. O. Leary	Computing Essentials	TMH
2.	Vikas Gupta	Comdex Computer Course Kit	Dreamtech


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Reference Books:

Sr. No	Author	Title	Publication
1.	Computer Fundamentals	BPB	P.K. Sinha
2.	Information Technology for Management	Tata McGraw Hill	Henry C. Lucas, Jr.

Learning Resources: Books, Models


(Prof. Smt. M. H. Thakre)
Prepared By


(Prof. S. B. Kulkarni)
Secretary, PBOS


(Prof. Dr. S. B. Nikam)
Chairman, PBOS

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Programme : Diploma in CM/IT
Programme Code : 06/07
Name of Course : Programming in C
Course Code : CM 263

Teaching Scheme:

	Hours /Week	Total Hours
Theory	04	64
Practical	02	32

Evaluation Scheme:

	Progressive Assessment	Semester End Examination			
		Theory	Practical	Oral	Term work
Duration	Two class tests of 60 Minutes	03 hrs.	---	---	---
Marks	20	80	50	---	25

Course Rationale:

In this era of high speed computing, it is necessary to program computers with the help of structured & dynamic languages like 'C' to study programming is useful in solving problems/tasks related to various domains. Now days almost every setup in software engineering domain chooses 'C' as a basic tool to develop software.

Course Objectives:

After studying this course, the student will be able to

- Write a programs using 'C' language
- Implement data types & structures related to problems.
- Solve the problems/tasks in structured way.

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Course Content:

Chapter No.	Name of Topic/Sub topic	Hrs	Weightage
1	Overview of 'C'		
	1.1 Introduction: development of 'C',	02	04
	1.2 Importance of 'C',		
	1.3 Basic structure of 'C' programs, programming style, sample 'C' programs, execution of 'C' program		
2	Data Types & Character Set		
	2.1 Character set, C tokens, keywords & identifiers, constants, variables. Data types, declaration of variables, assigning values to variables, defining symbolic constants.	04	06
3	Operators & Expressions		
	3.1 Operators: Arithmetic, relational, logical, increment & decrement, conditional, bit-wise special.	06	10
	3.2 Expressions: Arithmetic expressions, evaluation of expressions, procedure of arithmetic operators, type conversions in expressions, operator precedence & associativity, mathematical functions.		
	3.3 Managing input & output operators: Introduction, reading a character, writing a character, formatted input, formatted output.		
4	Decision Making		
	4.1 Branching & looping introduction, decision making with if statement, simple if statement, the if-else statement, The else if ladder, The switch statement, The?: operator, the go to statement, looping , introduction , the while statement , jumps in the loop, break statement.	06	08
5	Arrays		
	5.1 Introduction, one- dimensional arrays, two-dimensional arrays, multidimensional arrays, Initialization of arrays.	10	12
6.	Strings		

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	6.1	Introduction, declaring & initializing string variables, reading string, writing strings, arithmetic operations on string , putting strings together , comparison of two strings, string handling functions, table of strings	06	06
7.	User defined functions			
	7.1	Need of user defined function, the types of C functions, return values & their types, calling a function.	10	12
	7.2	Category of functions: No argument- No return value, Argument-No return value, No argument-return value & No argument- return value.		
	7.3	Handling non-integer functions, nesting of functions, recursion, and unction with arrays.		
8.	Structures & Unions			
	8.1	Structure definition, giving values to members, structure initialization and comparison structure variables.	10	12
	8.2	Arrays of structures, arrays within the structure, structure and functions, Unions, size of structures, bit fields & bit operations.		
9.	Introduction to Pointers			
	9.1	Pointer Concept,& and * operators, Declaration of Pointers, Initialisation of pointers, Pointer Expressions, Application of pointers, Array of Pointers, Pointer to array, function, structure, Function returning pointer and passing addresses to functions.	10	10
Total			64	80

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List of Practicals/Experiments/Assignments:

Sr. No.	Name of Practical/Experiment/Assignment	Hrs
1.	Demonstration of Turbo-C Compiler, Creating a program Compiling & linking executing programs.	02
2.	Write 'C' programs based on declaring variables & assigning values to variables. (Minimum 3)	02
3.	Write programs based on expressions and operators. Programs using scanf(), printf(), getch(), putch().(Minimum 4)	02
4.	Programs using following control statements: If statement, Switch statements, ?: operator, go to statements Programs using following loop controls, while loop do.. while loop for loop (Minimum 5)	06
5.	Write programs based on arrays. (Minimum 4)	04
6.	Write programs using strings operations such as comparison, concatenation, copying etc. (Minimum 3)	04
7.	Examples on User defined functions, demonstration of return data types. Write programs demonstrating four categories of functions. Programs based on recursion & nesting of functions. (Minimum 5)	04
8.	Write programs based on structure definition and initialization. Write programs based on structure within structure. Write programs based on bitwise operations. (Minimum 3)	04
9.	Write programs based on Pointers and pointer applications. (Minimum 3)	04
Total		32

Note :

- Minimum 30 Programs as specified in practical coverage section should be executed.
- Actual program statements on practical topics should be framed by the respective teachers.

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Instructional Strategy:

Sr. No.	Topic	Instructional Strategy
1.	Overview of 'C'	Demonstration of 'C' Compiler, Create simple program
2.	Data types & character set	Write 'C' programs based on declaring variables & assigning values to variables.
3.	Operators & Expressions	Explanation of operators, expressions & managing i/p & o/p operators.
4.	Decision Making	Theoretical explanation + writing program using different control statements.
5.	Arrays	Theoretical explanation & implementation of arrays.
6.	Strings	Theoretical explanation & implementation of strings.
7.	User defined functions	Explanation & implementation of examples on user defined functions,
8.	Structures and Unions	Theoretical explanation & implementation of structures & Unions.
9.	Pointers	Explanation & implementation of examples on Pointers

Text Books:

Sr. No	Author	Title	Publication
1.	E. Balagurusamy	Programming in ANSI 'C'	Tata- McGraw Hill pub.(Second Edition)

Reference Books:

Sr. No	Author	Title	Publication
1.	Yeshwant Kanetkar	Let us 'C'	BPB Publication
2.	Madhusudhan Mothe	C for Beginners	SPD Publication

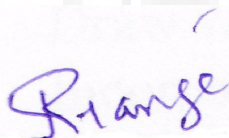
Learning Resources:


Black Board, Transparencies, Overhead projector, LCD, White Board.


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Specification Table:

Sr. No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1.	Overview of 'C'	01	01	02	04
2	Data types & character set	02	01	03	06
3.	Operators & Expressions	03	03	04	10
4.	Decision Making	02	04	02	08
5.	Arrays	03	04	05	12
6.	Strings	02	02	02	06
7.	User defined functions	04	04	04	12
8.	Structures and Unions	05	04	03	12
9.	Pointers	03	02	05	10
Total		25	25	30	80


(Prof. J.R.Hange)
Prepared By


(Prof. S. B. Kulkarni)
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Chairman, PBOS

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Programme : Diploma in ET/CM/IT
Programme Code : 03 /06 /07/17
Name of Course : Electrical Technology
Course Code : EE 262

Teaching Scheme:

	Hours /Week	Total Hours
Theory	03	48
Practical	02	32

Evaluation Scheme:

	Progressive Assessment	Semester End Examination			
		Theory	Practical	Oral	Term work
Duration	Two class tests , each of 60 Min. duration	03 Hrs	---	---	---
Marks	20	80	---	25	25

Course Rationale:

Now a day's various electronic circuits are used for different electrical equipments. Hence it is necessary to study the electrical principles and working characteristics of some of the electrical machines.

Course Objectives:

After studying this course, the student will be able to

- Understand the basic and fundamental principle of Electrical engineering circuit.
- To state the basic principles of electromagnetism, electrostatics and electromagnetic induction.
- Apply these principles to different electrical machines.
- Understand the principle and construction of various electrical machines and transformers
- To explore to electrical safety.

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Course Content:

Chapter No.	Name of Topic/Sub topic		Hrs	Weightage
1.	Electrical Circuits			
	1.1	Introduction to electrical power supply system, A.C. supply –single phase and three phase, DC supply.	03	04
	1.2	Resistance, Effect of temperature on resistance (pure metals, insulators, alloys), temperature coefficient of resistance.		
	1.3	Resistances in series, voltage division formula.		
	1.4	Resistances in parallel, current division formula. Simple numericals.		
2.	Electromagnetism & Magnetic Circuits			
	2.1	Magnetic field due to electric current, right hand grip rule, magnetic field of a solenoid.	04	08
	2.2	Production mechanical force on current carrying conductor placed in magnetic field. Fleming's Left hand rule		
	2.3	Introduction to magnetic circuit, M.M.F., absolute and relative permeability, reluctance, state the relation between M.M.F. and reluctance.		
	2.4	Comparison of magnetic & electrical circuits.		
	2.5	Simple series magnetic circuits, concept of useful flux, leakage flux, total flux & fringing.		
	2.6	Magnetization curves.		
	2.7	Concept of hysteresis, hysteresis loop & loss.		
	2.8	Practical importance of hysteresis loop		
3.	Electromagnetic Induction			
	3.1	Basic concept.	04	08
	3.2	Faradays law of Electromagnetic induction in brief		
	3.3	Nature of induced e. m. f. i.e. statically and dynamically.		
	3.4	Fleming's Right hand rule & Lenz's law.		
	3.5	Magnitude of dynamically induced e. m. f. (No Derivation)		

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	3.6	Magnitude of self & Mutual induced e. m. f. (No derivation)		
	3.7	Self & mutual inductance.		
	3.8	Factors affecting inductance of a coil		
	3.9	Coefficient of coupling.		
	3.10	Dot convention. Simple numericals.		
4.	Electrostatics			
	4.1	Brief review of electric field, field density, permittivity, relative permittivity, charge & their relation.	04	08
	4.2	Capacitor & Capacitance.		
	4.3	Capacitors in series & parallel.		
	4.4	Capacitance of parallel plate capacitor with single dielectric and composite dielectric medium (No derivation).		
	4.5	Charging and discharging of capacitor to give idea of RC time constant (no deviation)		
	4.6	Types of capacitors- Identification & colour coding. Simple numericals.		
5.	AC Fundamentals & Series Circuits			
	5.1	Generation of alternating voltage and current i.e. principles and descriptions of elementary alternators.	10	16
	5.2	Graphical representations of sinusoidal e.m.f and current.		
	5.3	General Equation of Alternating quantity.		
	5.4	Definitions of instantaneous value, cycle, period, frequency, amplitude.		
	5.5	Peak value, average value, r.m.s. value of an alternating sinusoidal voltage and current, Define peak factor and form factor..		
	5.6	Concept of phase and phase difference. Meaning of lagging and leading sine wave		
	5.7	Representation of an alternating quantity by phasor.		

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	5.8	Waveforms and Phase diagram for a Purely resistive AC circuit Purely inductive AC circuit. Purely capacitive AC circuit. (Voltage, Current, power, p.f. relations and phasor diagrams, no deviation).		
	5.9	Inductive reactance,		
	5.10	Capacitive reactance.		
	5.11	RL Series circuit: phasor diagram, Impedance, Impedance triangle, power factor. (only formulae , no derivations)		
	5.12	Definitions of apparent power, true power and reactive power.		
	5.13	R. C. circuit: phasor diagram, Impedance, Impedance triangle, power factor. (only formulae , no derivations)		
	5.14	R-L-C series circuit: phasor diagram, Impedance, Impedance triangle, power factor. (only formulae , no derivations)		
	5.15	Numerical on Series Circuits.		
6.	Three Phase Circuits			
	6.1	Introduction.	03	06
	6.2	Generation of 3-phase voltage and its waveform.		
	6.3	Phase sequence, star & delta connection.		
	6.4	Concept of balanced load.		
	6.5	Concept of balanced supply system.		
	6.6	Voltage, current, power relations in star & delta connected system & numerical (no derivation ,but simple numericals)		
	6.7	Advantages of poly phase circuits over 1-phase.		
7.	Single-Phase Transformers			
	7.1	Introduction.	04	06
	7.2	Principle of operation & construction of transformer.		
	7.3	Types of transformers on the basis of voltage, power & construction.		

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	7.4	E.M.F. equation (No derivation).		
	7.5	Voltage, current ratio of a transformer.		
	7.6	Losses in transformer, efficiency & regulation of transformer. imple numericals.		
8.	Electrical Motors			
	A)	D.C. Motors		
	8.1	Construction and Working principle of d .c. motor		
	8.2	Types of motors.		
	8.3	Characteristics & applications of d. c. motors.		
	8.4	Reversal of direction of rotation of motor.		
	8.5	Speed control of d. c. motor.		
	8.6	Necessity of a starter.		
	B)	Induction Motor		
	8.1	Construction and working principle of three phase Induction Motor.		
	8.2	Synchronous speed, slip, frequency of rotor current.		
	8.3	Factors determining the torque.		
	8.4	Torque –slip characteristic & starting of three phase I.M.,	12	16
	8.5	Principle of working, specifications and applications of Relay and Contactor.		
	8.6	D.O.L & star- delta starters.		
	8.7	Change the direction of rotation.		
	8.8	Single Phase Induction Motors- working principle, types and applications.		
	C)	Special Motors		
	8.1	Steeper motor, definition types and applications.		
	8.2	Servo motors, Definition, A.C. Servo motors, D.C. Servo motors applications.		
		d) Factors to be considered while selecting motor for particular application.		

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9.	Electrical Safety			
	9.1	I.E. rules for safety of person & equipment followed when working with electrical installation.	04	08
	9.2	Electrical shock, Procedure for rescuing a person who has received an electrical shock.		
	9.3	Operational precautions necessary to avoid electrical shock.		
	9.4	Introduction to circuit protective devices: Earthing, H.R.C. fuses, D.P. switch, MCB, safety tools, use of ELCB & Isolators.		
Total			48	80

List of Practicals/Experiments/Assignments:

Sr. No.	Name of Practical/Experiment/Assignment	Hrs
1.	To determine temperature rise of resistance of metal.	02
2.	Demonstration on production of mechanical force on current carrying conductor in magnetic field & verify Fleming's Left hand rule.	02
3.	To plot the B-H curve of a magnetic material.	02
4.	Verification of Faraday's Law of Electro Magnetic Induction & verify Fleming's Right hand rule.	02
5.	To plot the charging & discharging curve of a capacitor.	02
6.	To observe waveforms of A.C. Voltage and current on CRO, determine amplitude & phase and understand concept of lagging & leading.	02
7.	To determine the resistance & inductance of a choke coil.	02
8.	To measure voltage across each parameters of R-L-C series circuit and draw vector diagram. Also find impedance of circuit.	02
9.	To verify the relation between line & phase values of current and voltage in a balanced star & delta connected circuit.	04
10.	To determine voltage & current ratio of single-phase transformer.	02
11.	To determine efficiency and voltage regulation of single phase transformer by direct loading method.	02
12.	Speed control and reversal of rotation of D.C. shunt motor.	02

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13.	Reversal of rotation of Three phase Induction Motor.	02
14.	Demonstration & use relay & contactor with simple circuit.	04
15.	Demonstration of use & tripping of MCB against overload & short circuit.	04
16.	Demonstration of use & tripping of ELCB against leakage current	04
Total		40

Note : Any 12 practicals are to be conducted & at least 1 from each chapter.

Instructional Strategy:

Sr. No.	Topic	Instructional Strategy
1.	D.C. Circuits & basic terms	Lecture, problem solving, practical
2.	Electromagnetism & magnetic circuits	Lecture, Q/A technique.
3.	Electromagnetic induction	Lecture, problem solving
4.	Electrostatics	Lecture, problem solving
5.	AC Fundamentals & Circuits.	Lecture, problem solving, practical, Q/A technique.
6.	Three phase circuits	Lecture, problem solving, practical
7.	Single-phase transformers.	Lecture, problem solving, practical
8.	D.C. Machines	Lecture, problem solving, practical
9.	Induction motors.	Lecture, problem solving

Text Books:

Sr. No	Author	Title	Publication

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Reference Books:

Sr. No	Author	Title	Publication
1.	B.L Theraja	Electrical Technology Vol. I & II	S. Chand & Co.
2.	Edvard Hughes	Electrical Technology	Pearson Education.
3.	H.Cotton	Electrical Technology	CBC, Delhi
4.	B. H. Deshmukh	Electrical Technology	Nirali Prakshan
5.	V. N. Mittle	Basic Electrical Engineering	Tata McGraw Hill
6.	Prof. Kulkarni	Introduction to Industrial Safety	


Learning Resources:

Model, White Board, Transparencies, Overhead projector.

Specification Table:

Sr. No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1.	Electrical Circuits	02	00	02	04
2	Electromagnetism & magnetic circuits	04	02	02	08
3.	Electromagnetic induction	02	02	04	08
4.	Electrostatics	02	02	04	08
5.	AC Fundamentals & Series Circuits.	04	02	10	16
6.	Three phase circuits	02	02	02	06
7.	Single-phase transformers.	02	02	02	06
8	Electrical Motors	04	06	06	16
9	Electrical Safety	04	04	00	08
Total		26	22	32	80


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Programme : Diploma in ME / MT / CM / IT
Programme Code : 04/ 05 /06 /07/18/19
Name of Course : Elements of Electronics Engineering
Course Code : ET 262

Teaching Scheme:

	Hours /Week	Total Hours
Theory	03	48
Practical	02	32

Evaluation Scheme:

	Progressive Assessment	Semester End Examination			
		Theory	Practical	Oral	Term work
Duration	Two class tests , each of 60 minutes	3 hrs.	--	--	--
Marks	20	80	--	--	25

Course Rationale:

This course will be useful in understanding of construction, working and applications of semiconductor devices and circuits.

Course Objectives:

After studying this course, the student will be able to

- Explain construction, working, characteristics and applications of semiconductor devices and circuits.
- Build and test the circuits

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Course Content:

Chapter No.	Name of Topic/Sub topic	Hrs	Weightage
1.	Semiconductor devices		
	Concept & principles of electronics devices		
	<p>1.1 Rectifying diode : Review of P - type and N - type semiconductor ,PN junction, Barrier voltage , depletion region ,Junction Capacitance</p> <p>Forward biased & reversed biased junction</p> <p>Diode symbol , forward & reversed Characteristics of PN junction diode</p> <p>Specifications :</p> <p>Forward voltage drop , Reverse saturation current, maximum forward current , power dissipation ,Package view of diodes of different power ratings (to be shown during practical hours)</p>	15	20
	<p>1.2 Zener diode :</p> <p>construction ,Symbol ,characteristics (forward & reversed) Avalanche & zener breakdown</p> <p>Specifications :</p> <p>Zener voltage , power dissipation , break over current,dynamic resistance & maximum reverse current (to be shown during practical hours)</p>		
	<p>1.3 Rectifier :</p> <p>Half wave and Full wave Rectifier, circuit diagram, working, comparison, merits and demerits. Filters, necessity, types, comparison, merits, demerits.</p>		
	<p>1.4 Transistor :</p> <p>construction, symbol, operating principle, characteristics, applications, rating and specifications, configurations, comparison between CB, CE, CC.</p>		
	<p>1.5 UJT :</p> <p>Construction, symbol, operating principle, characteristics, applications, rating and specifications.</p>		

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	1.6	FET: Construction, symbol, operating principle, characteristics, applications, rating and specifications, configurations, comparison.		
	1.7	SCR : Symbol, their construction, working, characteristics, applications		
2.	Oscillator			
	2.1	Block diagram, Barkhausen Criteria for sustained oscillations, classification: LC and RC. Oscillations in LC tank circuit; Hartley; Colpitts. RC Wein Bridge and Phase shift, Oscillator. Crystal Oscillator.	07	12
3.	Digital Fundamentals			
	3.1	Number systems: Decimal, Binary, Hexadecimal, Octal.	07	12
	3.2	Basic logic gates: AND, OR, NOT, NAND, NOR, EXOR symbols, IC numbers and Truth Table.		
	3.3	Logic families : TTL, CMOS		
	3.4	Boolean Algebra: Fundamentals of Boolean algebra, Basic laws, De Morgan's theorem,		
4.	Linear ICs,			
	4.1	OP AMP. IC 741, symbol, pin diagram, ideal and typical characteristics, Applications such as Inverting , Non Inverting amplifier, Difference amplifier, adder subtractor , Integrator, differentiator.	07	12
	4.2	Timer IC 555: Block diagram, operating modes viz. Astable, Monostable.		
5.	Instrumentation			
	5.1	CRO: Cathode Ray Tube, Oscilloscope Block diagram, operation, oscilloscope specifications, Applications.	05	12
	5.2	Function generator, Block diagram, operation, specifications, applications		

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6.	Transducer		
	6.1	Definition, classification: Active, Passive, Primary, Secondary, Mechanical, Electronic, Analog, Digital, Selection criteria, Resistive, Capacitive, Inductive, Transducers(LVDT), Photoelectric, Piezoelectric Transducers, proximity switch, Construction, Operation, One example of each, Applications,	07
			12
Total			48
			80

List of Practicals/Experiments/Assignments:

Sr. No.	Name of Practical/Experiment/Assignment	Hrs
1.	Plot V-I characteristics of P-N junction diode.	02
2.	Study of Half wave and Full wave rectifier with and without filter.	02
3.	Plot the i/p and o/p characteristics in CE configurations.	02
4.	Plot the characteristics of FET.	02
5.	Plot the characteristics of UJT.	02
6.	Plot the characteristics of SCR.	02
7.	Study of Hartley and Colpitts oscillator.	02
8.	Study of RC phase shift and Wein Bridge.	02
9.	Study of logic gates and verifications of logic gates.	02
10.	Verification of De Morgan's theorem.	02
11.	Study of Inverting and Non Inverting Amplifier.	02
12.	Study of Adder, Subtractor.	02
13.	Study of Integrator and Differentiator.	02
14.	Study of astable multivibrator using 555.	02
15.	Study of C.R.O.	01
16.	Study of Function generator.	01
17.	Study of Transducers.	02
Total		32

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Instructional Strategy:

Sr. No.	Topic	Instructional Strategy
1.	Semiconductor devices.	Classroom teaching and laboratory work.
2.	Digital fundamentals.	Classroom teaching and laboratory work.
3.	Linear IC's.	Classroom teaching and laboratory work.
4.	Oscillator.	Classroom teaching and laboratory work.
5.	Instrumentation.	Classroom teaching and laboratory work.
6.	Transducer.	Classroom teaching and laboratory work.

Text Books:

Sr. No	Author	Title	Publication
2.	Albert Malvino.	Basic Electronics.	TMH.
3.	Katre.	Basic Electronics.	Tech-Max.
4.	B.L.Theraja.	Basic Electronics.	S.Chand.
5.	Ramakant Gaikwad	Linear Integrated Circuits	PHI
6.	R P Jain	Modern Digital Electronics	TMH
7.	A K Sawheny	Instrumentation	DHANPAT RAI & SONS

Reference Books:

Sr. No	Author	Title	Publication
3.	Mottershed	Electronics Devices and Circuits.	PHI
4.	Milmann Halkies	Electronics Devices and Circuits.	TMH


Learning Resources:

Reference Books, Data Manual

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Specification Table:

Sr. No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1.	Semiconductor Devices	10	06	04	20
2.	Oscillators	04	06	02	12
3.	Digital Fundamentals	06	04	02	12
4.	Linear I C 's	06	04	02	12
5.	Instrumentation	06	04	02	12
6.	Transducers	06	04	02	12
Total		38	28	14	80



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GOVERNMENT POLYTECHNIC, PUNE
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Programme : Diploma in EE / ET / CM / IT
Programme Code : 02 / 03 / 06 / 07/16/17
Name of Course : Graphics Skills & Auto CAD
Course Code : ME261

Teaching Scheme:

	Hours /Week	Total Hours
Theory	02	32
Practical	04	64

Evaluation Scheme:

	Progressive Assessment	Semester End Examination			
		Theory	Practical	Oral	Term work
Duration	---	---	---	---	---
Marks	---	---	50	---	50

Course Rationale:

Engineering drawing is the graphical language. It is used by engineers, designers, planners, supervisors and also the workers to express their thoughts, ideas and concepts. The expression by drawing is very accurate, precise and brief. At a glance one can understand detailed description of any part to be manufactured or a dam to be built or an electric circuit to be used. For all technicians through understanding of principles of engineering drawing (Graphic Skills) is essential.

Course Objectives:

After studying this course, the student will be able to

- Draw various engineering curves.
- Incorporate Indian Standards in drawings.
- Sketch various orthographic and isometric views.

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- Draw all different views from given components vis-à-vis.
- Draw free hand sketches.
- Have hands on experience on AutoCAD.
- Under stand use of AutoCAD in 2D drawing
- Convert 2D drawing into AutoCAD drawing

Course Content:

Chapter No.	Name of Topic/Sub topic		Hrs	Weightage
SECTION-I				
1.	Introduction of Drawing Instruments, Lines, Letters etc.		02	--
	1.1	Use of different drawing equipments.		
	1.2	Types of letters.		
	1.3	Conventions of lines.		
	1.4	Scales.		
2.	Curve and Tangential Exercises		04	--
	2.1	Geometrical constructions and tangential exercises.		
	2.2	To draw an ellipse by concentric circle method.		
	2.3	To draw a parabola by : i) Directrix focus method.		
	2.4	To draw a hyperbola by : i) Directrix focus method.		
3.	Orthographic Projections		10	--
	3.1	Introduction to orthographic projections first and third angle method of projection. Conversion of simple pictorial view, Dimensioning technique.		
4.	Sectional Orthographic Projections		06	--
	4.1	Introduction, converting the given pictorial view into sectional views.		
5.	Isometric Views		08	--
	5.1	Isometric scale and isometric views of simple objects.		
	5.2	Isometric views of rectangular, cylindrical objects, slots on sloping surface.		
6.	Free Hand Sketches		02	--
	6.1	Free hand sketches of respective branches		

SECTION-II				
7.	AutoCAD Fundamentals			
	7.1	Introduction to AutoCAD, Importance of Computer aided Drafting, AutoCAD's Graphical user interface, standard tool bar and menus, pull down menus ,screen menu tool bars displaying and hiding , drawing area , command prompt area , status line, text screen , UCSICON coordinator systems: Cartesian and polar Coordinate system.	02	--
8.	Setting Up AutoCAD Environment			
	8.1	Concept of setting up drawing, -determination of paper size, drawing scale, angles. Lines, colours, Methods of settings: Setting from scratch- default values, Using wizards to Automate settings, Using available Templates.	03	--
9.	Drawing in AutoCAD			
	9.1	AutoCAD command entry methods using command prompt, screen menu, pull down menu, Tool bar coordinate point entry method – using Absolute & relative coordinates Basic Geometric commands: Point, line, arc, circle, rectangle, ellipse, polygon, polyline, doughnut, sketch Redraw, regen and regen auto commands.	02	--
10.	Drawing Accurately and Speedily			
	10.1	Accuracy using grid, snaps, ortho and coordinate display Accuracy using object snap options- center, endpoint, insertion, intersection, midpoint, nearest, perpendicular, quadrant. Erase, break, trim, extend, stretch, move, rotate, chamfer, fillet. Copy, array, offset Display control commands such as zoom with its options. Pan and its options.	03	--

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11.	Layers and Line Types		02	--
	11.1	Concept of Layer, creating layer, organizing layers, controlling layers using ON/OFF, LOCK/UNLOCK, FREEZE/THAW commands Working with existing line types, assigning colour and a line type to a layer, line type scale factor, setting of the line type for the new objects, modifying line types and scale factor for existing object		
12.	Creating Blocks		02	--
	12.1	Concept of block, local and global block, creating block, inserting block, exploding block and redefining block.		
13.	Drawing and Plotting		04	--
	13.1	Text handling: single line text, text styles, Mtext. Section lines/hatching lines. Dimensioning: Fundamentals, dimension variables, styles, methods such as linear dimensioning: horizontal, vertical aligned, rotated, base line, continue, angular dimensioning, diameter and radius dimensioning, leader, tolerancing and plotting the drawing.		
Total			48	--

List of Practicals/Experiments/Assignments:

Sr. No.	Name of Practical/Experiment/Assignment	Hrs
SECTION - I		
5 sheets on topics covered in the syllabus.		
1.	Line letters and numbers. (Sheet No. 1)	02
2.	Engineering curves and tangential exercises. (Sheet No. 2)	04
3.	Orthographic projection. (Sheet No. 3)	10
4.	Sectional views(Sheet No. 3)	06
5.	One sheet Isometric projection(Sheet No. 4)	08
6.	Free hand sketches. (Sheet No. 5)	02
Total		32

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SECTION - II		
7 Assignments on covered syllabus		
7.	Assignments on AutoCAD fundamentals	04
8.	Assignments on Setting up AutoCAD environment	03
9.	Assignments on Drawing in AutoCAD	06
10.	Assignments on Drawing accurately and speedily	06
11.	Assignments on Layers and Line types	06
12.	Assignments on Creating Blocks	03
13.	Assignments on Drawing and Plotting	04
Total		32

Note: 1) Th-2 & PR-2 for Graphic Skills, Th-0 & PR-2 for Auto CAD
2) Term work evaluation on Graphic skill & Practical evaluation on AutoCAD.

Instructional Strategy:

Sr. No.	Topic	Instructional Strategy
SECTION -I		
1.	Curves and tangential exercises	Demonstrations and classroom teaching.
2.	Orthographic projection	Use of models and classroom teaching.
3.	Sectional views	Use of models, transparencies and classroom teaching.
4.	Missing views	Classroom teaching, self study and assignments.
5.	Isometric views	Classroom teaching and use of models.
6.	Free hand sketches	Self study, assignments.
SECTION -II		
7.	Introduction	Classroom teaching and Computer Lab. teaching
8.	Initial Setting And Drawing Aids	
9.	Basic 2D Commands	
10.	Dimensioning	
11.	Layer & Line Properties	
12.	Blocks And Attributes	
13.	Hatching	
14.	Basic 3D Commands	
15.	Plotting	
16.	Script Files & Lisp Files	

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Text Books:

Sr. No	Author	Title	Publication
1.	N.D. Bhatt	Elementary Engg. Drawing (Including plan and solid geometry)	Charotar Publication, Anand.
2.	Mali, Choudhary	Engineering Drawing	Vrinda Prakashan, Jalgaon
3.	K. Venugopal	Engineering Drawing and Graphics + AutoCAD	New Age International Publishers.

Reference Books:

Sr. No	Author	Title	Publication
1.	N.D. Bhatt	Geometrical and Machine Drawing	Charotar Publication, Anand.
2.	--	I.S. 696 Latest version	B.I.S.
3.	Curriculum Development Centre, TTTI, Bhopal	A Workbook in Engineering Drawing	Somaiyya Publication Pvt. Ltd., Mumbai
4.	--	SP 46 – 1988	B.I.S.
5.	G.R. Nagpal	Machine Drawing	--

Learning Resources:

Video cassettes No. 122, 123 of G.P.P. Library



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GOVERNMENT POLYTECHNIC, PUNE
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Programme : Diploma in CM / IT
Programme Code : 06 / 07
Name of Course : Workshop Practice (CM/ IT)
Course Code : WS 263

Teaching Scheme:

	Hours /Week	Total Hours
Theory	--	--
Practical	04	64

Evaluation Scheme:

	Progressive Assessment	Semester End Examination			
		Theory	Practical	Oral	Term work
Duration	--	--	--	--	--
Marks	--	--	--	--	50

Course Rationale:

To make the students conversant with use of various workshop tools used in smithy, carpentry, fitting shops and PC components and devices

Course Objectives:

After studying this course, the student will be able to

- Interpret the assigned job drawing.
- Identify various tools used in different shops of Work shop.
- Select appropriate tool set to perform a specific job.
- Acquire skills to use various tools.
- Take care and maintain the tools.
- Open and connect various PC components.
- Connect external devices.

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Course Content:

Chapter No.	Name of Topic/Sub topic	Hrs	Weightage
1.	Sketch of smithy/forging Hand tools , Equipments, with construction and Application.	04	05
2.	Sketch of carpentry hand tools , Equipment with construction and application	14	10
3.	Sketch of fitting and filling hand tools , equipment with construction and application	14	10
4.	Computer workshop : Demonstrating Opening and closing PC PC components Cleaning keyboard Handling printers : Printer ON – OFF, Setting printers, Paper feeding, ejecting. Removing and mounting ribbon / cartridge. Removable medias : Hard disk : Attaching and jumper setting Floppy disk : Inserting, removing and attaching drives. CDROM : Inserting, removing and attaching drives Back Panel demonstration Monitor, Scanner, Speakers connection. Processor, Fan and RAM chips mounting. Cards: LAN cards, display cards, Modem card, connecting to external modem. Motherboard fitting and connections, power supply and front panel connection.	04 02 04 04 04 02 02 02 04 04	25
Total		64	50

Note : Journal writing and submission on above given topics.

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List of Practicals/Experiments/Assignments:

Sr. No.	Name of practical/Experiment/Assignment	Hrs
1.	Demo of job involving minimum three operations. e.g. Upsetting, Drawing Down, Bending, Setting down.	04
2.	One useful carpentry job involving carpentry joints and wood turning	14
3.	One useful fitting job involving Marking, Filing, Sawing, Drilling, Tapping	14
4.	Demonstrating Opening and closing PC PC components Cleaning keyboard Handling printers : Printer ON – OFF, Setting printers, Paper feeding, ejecting. Removing and mounting ribbon / cartridge. Removable medias : Hard disk : Attaching and jumper setting Floppy disk : Inserting, removing and attaching drives. CDROM : Inserting, removing and attaching drives Back Panel demonstration Monitor, Scanner, Speakers connection. Processor, Fan and RAM chips mounting. Cards : LAN cards, display cards, Modem card, connecting to external modem. Motherboard fitting and connections, power supply and front panel connection.	04 02 04 04 04 02 02 02 04 04
Total		64

Instructional Strategy:

Sr. No.	Topic	Instructional Strategy
1.	Smithy and forging	Explanation, Demonstration, exhibition of Models/samples pieces.
2.	Carpentry	
3.	Fitting and filling	
4.	Computer W / S	Explanation and Demonstration

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Text Books:

Sr. No	Author	Title	Publication
1.	Mali and Ghan	Elements of electrical and mechanical technology(Mechanical technology portion)	Nirali and Pragati Prakashan
2.	Deshmukh Mandke	Elements of electrical and mechanical technology(Mechanical technology portion)	Nirali Prakashan
3.	Choudhari M.A.	Elements of electrical and mechanical technology(Mechanical technology portion)	Sandeep Prakashan, Pune
4.	M. David Stone & Alfred Poor	Troubleshooting your PC	PHI

Reference Books:

Sr. No	Author	Title	Publication
1.	S. K. Hajara Choudhari A. K. Hajara houdhari	Elements of workshop technology – Vol. I	Media promoters and Publishers Pvt. Ltd., Mumbai-7
2.	V. Kapoor	Workshop practice Manual	Dhanpat Rai and sons, New Delhi – 32
3.	B. S. Raghuwanshi	A course in workshop technology Vol-I	Dhanpat Rai and sons, New Delhi – 32.
4.	Govindrajalu	IBM PC clones	BPB Publication

Learning Resources:

Demonstration kit, charts, models/sample pieces and books. Video cassette.

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Specification Table:

Sr. No	Topic	Cognitive	PSYCHOMOTOR			Total
		Knowledge	Imitation	Manipulation	Perfection	
1.	Smithy and forging	5	--	--	--	5
2.	Carpentry	3	2	3	2	10
3.	Fitting and filling	3	2	3	2	10
4.	Computer Workshop	8	5	8	4	25
Total		19	09	14	08	50



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