# SYLLABUS
# FOR
# POST GRADUATE DIPLOMA
# IN
# COMPUTER APPLICATION

FOR THE STUDENTS TO BE ADMITTED IN THE SESSIONS 2020-21, 2021-22, 2022-2023

## A. Eligibility

Minimum qualification required for admission to the PGDCA course shall be:-

Bachelor's Degree of 10+2+3 pattern in any discipline / graduation in any professional programme of more than three years duration or any other qualification recognized by the University as equivalent there to, with at least 50% of the aggregate marks (40% for the candidates belonging to Scheduled Caste) in Bachelor Degree Examination.

## B. Selection Criteria

Admission to PGDCA will be governed under JUET.

## C. Intake Capacity

The maximum intake for PGDCA course will be 30.

## D. Medium of Instruction and Examination

Latest Audio Visual tools will be used for the delivery of Classroom Lectures as well as practical. Medium of instruction will be in English. Medium of examination will also be in English.

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## PGDCA PROGRAMME STRUCTURE

| Course No. | Title | Duration of Exam | External Exam | Internal Assessment | Contact hours per week L-T-P |
|---|---|---|---|---|---|
| CS-401 | Introduction to Computers and their Applications | 3 | 80 | 20 | 3-0-0 |
| CS-402 | Introduction to Computer Organisation | 3 | 80 | 20 | 3-0-0 |
| CS-403 | Computer Networks & Problem Solving with C++ | 3 | 80 | 20 | 3-0-0 |
| Cs-404 | Data Structure & Structured System Analysis and Design | 3 | 80 | 20 | 3-0-0 |
| CS-405 | Database Management System | 3 | 80 | 20 | 3-0-0 |
| CS-406 | PC-Software (Practical I) | 4 | 75 | 75 | 0-0-5 |
| CS-407 | Programming with C++ (Practical II) | 4 | 75 | 75 | 0-0-5 |
| CS-408 | Business Data Processing Lab (Practical III) | 4 | 75 | 75 | 0-0-5 |
| CS-409 | Project Work | | | 50 | 0-0-3 |
| **Total** | | | | | **15-0-18** |

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# DETAILED SYLLABUS

(Prescribed by University of Jammu)

## COURSE NO. CS – 401

## TITLE: INTRODUCTION TO COMPUTERS AND THEIR APPLICATIONS

CONTACT HOURS: 120 Hours MAX MARKS: 100

A ) SEMESTER EXAMINATION: 80
B ) SESSIONAL ASSESSMENT: 20

Time allotted for Examination = 3 hours
Examination to be held: 2021, 2022, 2023

**UNIT 1**

Elements of Computer Processing, Hardware-CPU, VDU, Storage Devices and Media, Input/Output Devices, Data Communication Equipment, Software-System Software, Application, Packages.
Computer Systems: Single/Multi-user, Workstation, Client-Server, Supercomputers, Mainframes, Desktop Systems (PC Workstations), Networks of Computers: Homogenous/Heterogeneous.

**UNIT 2**

Programming Languages Classification, Machine Language, Assembly Language, High Level Languages, Computer Languages, Machine Code, Assembly Code, High Level Code, Machine, Language at the Binary Level, Two Part Machine Code (Operation Code and Address ).
Assembly Language, Mnemonics, Low Level Language, Assembly to Machine Code Conversion, Assemblers, Higher Level Languages (HLL), Machine Independence, Portability, Problem Oriented Languages, Source Code, Object Code, Executable Code, Machine Code, Interpreter, Compiler, Linker, Stored Program Concept.

**UNIT 3**

Disk Operating System: The Fundamentals of DOS, DOS and Disks, Disk Organization, Understanding DOS Prompt and Shell Screen using Keyboard and Mouse, Internal & External Commands, Batch Files, using the Screen Editor, Printing Images, ASCII & Multiple Files, Indirect Printing and Spooling, Communicating with other devices, Parallel vs Serial Communication, Optimizing DOS, Config.sys and Autoexec.bat Files, Freeing up Memory at Boot Time, Managing Extended/Expanded Memory, RAM Disk, Disk Caching, Defragmentation.
Windows OS: Windows fundamentals, anatomy of a window, Files, Folders and Shortcuts, Desktop, Windows Explorer and its features, Drag and Drop, Cut-Paste &

Copy-Paste, Setting Printer, Adding New Hardware, Adding/Removing Programs, Setting Display Properties, Setting Task Bar Properties, Working with Accessories Applications, Working with Scan Disk, Disk Clean-up and Disk Defragmenter applications.

**UNIT 4**

MS–Word: Fundamentals of MS-Word, menus, toolbars, ruler scroll bars, status bar, creating, saving, importing, exporting and inserting files, formatting, indents/outdents, lists, tabs, styles, working with frames, columns, pictures, charts/graphs, forms, tools, equation and macros.

**UNIT 5**

MS-Excel: Worksheet overview, rows, columns, cells, menus, creating worksheets, formatting, printing, charts, window, establishing worksheet links, macros, database, tables, Introduction to PowerPoint.

## INTERNAL ASSESSMENT:

20% of the total marks shall be reserved for internal assessment which will be based on one test and one assignment.

## INSTRUCTIONS TO PAPER SETTER:

Question paper will be comprised of 10 questions in total, each of 16 marks. The examiner will set two questions from each unit; the student has to attempt five questions selecting one question from each unit.

## REFERENCE BOOKS:

1) V. K. Kapoor, "Introduction to Computer Data Processing & System Analysis", I$^{st}$ edition, Sultan Chand and Sons.
2) P. K. Sinha and P. Sinha, "Computer Fundamentals", 6$^{th}$ edition, BPB Publications.
3) P. Norton, "Complete Guide to DOS 6.22", I$^{st}$ edition, Sams Publishing.
4) S. S. Shrivastava, "MS-Office", I$^{st}$ edition, Laxmi Publication.
5) J. Lambert and C. Frye, "Microsoft Office 2016 Step by Step", I$^{st}$ edition, Microsoft Press.
6) R. K. Gaur, "Digital Electronics and Microprocessor", I$^{st}$ edition, Dhantpat Rai Publications.
7) R. Gaonkar, "Microprocessor Architecture Programming and Applications with 8085", 5$^{th}$ edition, Prentice Hall.

-- End of CS-401 --

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# COURSE NO. CS – 402

## TITLE: INTRODUCTION TO COMPUTERS ORGANISATION

CONTACT HOURS: 120 Hours MAX MARKS: 100

A ) SEMESTER EXAMINATION: 80
B ) SESSIONAL ASSESSMENT: 20

Time allotted for Examination = 3 hours
Examination to be held: 2021, 2022, 2023

**UNIT 1**

Representation of Information: Number Systems, Binary, Octal, Hexadecimal, Positive and Negative Numbers, Integers and Reals, Character Codes-ASCII, EBCIDIC, Redundant Coding For Error Detection and Correction.

**UNIT 2**

Basic Logic Design: Truth Tables, Boolean Algebra, Combinational Circuit Design with AND, OR, NOT, NAND & NOR Gates and Multiplexers, Flip-Flops, Shift Registers and Counters, Simple Arithmetic and Logic Circuits.

**UNIT 3**

Memory Devices, Random Access, Serial Access and Direct Access Memories and their specifications.

**UNIT 4**

CPU Architecture: Instruction Format, Addressing Modes, Direct, Indirect, Immediate, Relative, Indexed, Addressing Formats: Zero, Single, Double, Register etc. Instruction Set Selection, Software Tradeoffs, Instruction Execution Fetch Execution Cycles, Microprogramming Concepts, Speed Mismatch between CPU and Memory and Method of Alleviating it.

**UNIT 5**

I/O Architecture: Properties of Simple I/O Devices and their Controllers, Transfer of Information between I/O Devices, CPU & Memory, Program Controlled and Interrupt Controlled Information Transfer, Alleviating Speed Mismatch between I/O Units and Memory, DMA Control, I/O Channels and Peripheral Processors.

**INTERNAL ASSESSMENT**:

20% of the total marks shall be reserved for internal assessment which will be based on one test and one assignment.



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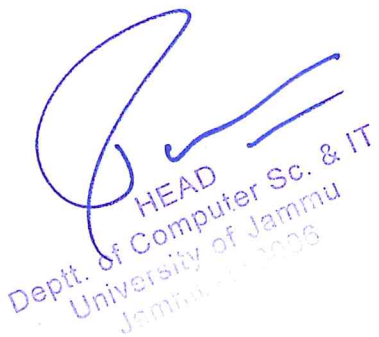
**INSTRUCTIONS TO PAPER SETTER:**

Question paper will be comprised of 10 questions in total, each of 16 marks. The examiner will set two questions from each unit; the student has to attempt five questions selecting one question from each unit.

**REFERENCE BOOKS:**

1) C. W. Gear, "Computer Organization and Programming", I[st] edition, McGraw–Hill.
2) A. S. Tannenbaum, "Structured Computer Organization", I[st] edition, Prentice-Hall of India.
3) M. M. Mano, "Computer System Architecture", I[st] edition, Prentice–Hall of India.
4) G. Langholz, J. Grancioni and A. Kandel, "Elements of Computer Organization", I[st] edition, PHI.
5) Hayes, "Computer Architecture and Organization", I[st] edition, McGraw–Hill International Edition.
6) M. E. Sloan, "Computer Hardware and Organization", 2nd Edition, Galgotia Publication Pvt. Ltd.
7) T. L. Floyd, "Digital Fundamentals", 3rd edition, Universal Bookstall and Pvt. Ltd.
8) R. K. Gaur, "Digital Electronics and microprocessor", I[st] edition, Dhantpat Rai Publication.

-- End of CS-402 --



# COURSE NO. CS – 403

## TITLE: COMPUTER NETWORKS & PROBLEM SOLVING WITH C++

CONTACT HOURS: 120 Hours MAX MARKS: 100

A ) SEMESTER EXAMINATION: 80
B ) SESSIONAL ASSESSMENT: 20

Time allotted for Examination = 3 hours
Examination to be held: 2021, 2022, 2023

**UNIT 1**

Introduction to Computer Networking, Communication & Internet, Computer Communication, Need for Data Transmission over Distances, Methods of Data Transmission: Communication Channels, Twisted Pair Wire, Co-Axial Cable, Microwave, Radio wave, Optical Fiber, Satellite.
Band and Band Width, Digital and Analog Transmission: Serial/Parallel Transmission, Modems, Communication Protocols, Synchronous and Asynchronous Transmission, Simplex, Half Duplex, Full Duplex.

**UNIT 2**

Networking and Computers: Need and Advantages of Networking, Share Computer files, Equipments, Facilitate Inter-User Communication, Consideration and Cost Training, Upkeep and Security.
Local Area Networks (LAN): ISO - OSI model (functionalities), Types of LAN -Star, Ethernet, Bus Wide Area Networks, Express Networks, Protocol Gateways, Bridges.

**UNIT 3**

Introduction to Internet, E-Mail, World Wide Web, Gopher, Mosaic, Overview of HTML and Web Design, Overview of Java.

**UNIT 4**

Overview of Programming: Introduction of Computer-Based Problem Solving, Requirements of Problem Solving by the Computer, Program Design and Implementation Issues, Programs and Algorithms, Construction of Loops-Basic Programming Constructs, Implementation.

**UNIT 5**

Fundamentals of C++ Programming: Overview of Object Oriented Programming, Data Types, Constant and Variables, Variable Declaration, Constants, Operators And Expression, Control Constructs, Arrays, Functions, Basic I/O, Scope Rules, Pointers, Structures, Class, Operator Overloading, Inheritance, Files and Streams.

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## INTERNAL ASSESSMENT:

20% of the total marks shall be reserved for internal assessment which will be based on one test and one assignment.

## INSTRUCTIONS TO PAPER SETTER:

Question paper will be comprised of 10 questions in total, each of 16 marks. The examiner will set two questions from each unit; the student has to attempt five questions selecting one question from each unit.

## REFERENCE BOOKS:

1. A. S. Tanenbaum, "Computer Networks", 5th edition, Pearson Education Asia.
2. B. A. Forouzan, "Data Communications and Networking", 4th edition, Tata McGraw Hills, 2004.
3. W. Stallings,"Data and Computer Communication", 7th edition, Pearson Education Asia, 2016.
4. P. C. Gupta, "Data Communications and Computer Networks", Ist edition, PHI.
5. W. A. Shay, "Understanding Data Communications and Networks", 2th edition, Thomson Asia Pvt. Ltd.
6. D. Ravichandran, "Programming with C++", 3rd edition, McGraw Hill Education.
7. E. Balaguruswamy, "Programming with C++", 7th edition, McGraw Hill Education.

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# COURSE NO. CS – 404

## TITLE: DATA STRUCTURE & STRUCTURED ANALYSIS AND DESIGN

CONTACT HOURS: 120 Hours MAX MARKS: 100

A ) SEMESTER EXAMINATION: 80
B ) SESSIONAL ASSESSMENT: 20

Time allotted for Examination = 3 hours
Examination to be held: 2021, 2022, 2023

**UNIT 1**

Basic concepts of data and their representations, arrays, access formula, insertion, deletion, searching and sorting.
Linked List, Implementation, Insertion, Deletion, Traversing, Doubly Linked List, Applications of Linked List.

**UNIT 2**

Stack, Sequential and Linked Representation, Push & Pop Operation, Applications. Queue, Sequential & Linked representation, Insertion and Deletion operation, Deque, Priority Queue, Circular Queue, Applications.

**UNIT 3**

Trees, Binary Trees, Binary Search Tree, Heap, Trees Traversal, Implementation, B-Tree, B+Tree, Graphs, Breadth First Search, Depth First Search, Applications.

**UNIT 4**

System Investigations: Project Selection, Feasibility Analysis, Fact Gathering, Human Aspects System Design and Implementation and Evaluation, Input Editing and Validation, Audit Considerations, Computer Workload, Scheduling-Documentation and its Importance-Specification Language.

**UNIT 5**

Methods Tools of Analysis, DFD, Data Dictionary, Decision Tables, Decision Trees, Design Consideration, Database Design and Normalization, Module Testing, System Testing and Implementation.

**INTERNAL ASSESSMENT**:
20% of the total marks shall be reserved for internal assessment which will be based on one test and one assignment.

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## INSTRUCTIONS TO PAPER SETTER:

Question paper will be comprised of 10 questions in total, each of 16 marks. The examiner will set two questions from each unit; the student has to attempt five questions selecting one question from each unit.

## REFERENCE BOOKS:


1. V. Goyal, "A Simplified Approach to Data Structures", I[st] edition, Shroff Publishers Pvt. Ltd, 2014.
2. GAV Pai, "Data Structures and Algorithms", I[st] edition, Tata McGraw Hills, 2017.
3. S. Lipschutz, "Data Structures with C", I[st] edition, Schaum Outlines, 2011.
4. R. Thareja, "Data Structures using C", 2nd Edition, Oxford University Press, 2014.
5. A. V. Aho, J. E. Hopcroft and J. D. Ullman, "Data Structures and Algorithms", I[st] edition Pearson Education India, 2001.
6. J. P. Tremblay and P. G. Sorenson, "Introduction to Data Structures with Application", 2nd edition, Tata McGraw-Hill, 2001.
7. E. M. Awad, "System Analysis and Design", 2[nd] edition, Galgotia Publications Pvt Ltd.
8. P. Gupta, "Structured System Analysis and Design", I[st] edition, Laxmi Publications, 2005.


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# COURSE NO. CS – 405

## TITLE: DATABASE MANAGEMENT SYSTEM

CONTACT HOURS: 120 Hours MAX MARKS: 100

A ) SEMESTER EXAMINATION: 80
B ) SESSIONAL ASSESSMENT: 20

Time allotted for Examination = 3 hours
Examination to be held: 2021, 2022, 2023

**UNIT1**

Data Independence, Data Models, Net Work Model, DBTG Proposal, Definition and Manipulation Languages, Hierarchical and Relational Models, DBMS: architecture, users, advantages & disadvantages.

**UNIT 2**

Storage Organization for Relations, Relational Algebra and Calculus, Relational Query Languages, Query Processor and Optimizers, Integrity constraints.

**UNIT 3**

Functional Dependencies, Normal Forms, Multi Valued Dependencies, Decomposition, Normal Forms, Integrity, Protection.

**UNIT 4**

Security, Concurrency, Recovery, Distributed Databases, Available Database System, Problems of Concurrent transactions and control mechanism.

**UNIT 5**

Case Studies of few Business Systems for small business organization Using MS-Access and Visual Basic (MS Access: Introduction, RDBMS, Objects, Data Types, Create Database, Create Table, Queries.
Visual Basics: Introduction, Excel Macros, Input Box, Variables, Loops, Decisions, Strings, Arrays, Functions, Basic programs.)

**INTERNAL ASSESSMENT:**

20% of the total marks shall be reserved for internal assessment which will be based on one test and one assignment.



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## INSTRUCTIONS TO PAPER SETTER:

Question paper will be comprised of 10 questions in total, each of 16 marks. The examiner will set two questions from each unit; the student has to attempt five questions selecting one question from each unit.

## REFERENCE BOOKS:

1) B. C. Desai, "An Introduction to Database Systems", I[st] edition, West-publishing company, 2012.
2) R. Elmasri and S. B. Navathe, "Fundamentals of Database Systems", 6[th] edition, Pearson Education, 2011.
3) C. J. Date, "An Introduction to Database Systems", I[st] edition, Addison Wesley Pearson Education, 2014.
4) N. S. Umanath and R. W. Scamell, "Data Modelling and Database Design", I[st] edition, Thomson Course Technology India Edition.
5) N. Tiwari, "MS - Access", 3[rd] edition, Narendra Publication, 2015.
6) B. Newsome, "Beginning Visual Basic 2015", I[st] edition, Wrox, 2016.
7) J. L. Viescas, "SQL Queries", 4[th] edition, Addison-Wesley Professional, 2018.
8) P. E. Demertzoglou, "MS Access 2013 SQL Comprehensive", I[st] edition, Alpha Press, 2015.
9) P. Lomax, "VB & VBA in a Nutshell: The Language", I[st] edition, O'Reilly Media, 1998.

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# COURSE NO. CS – 406

## TITLE: PRACTICAL I
## (PC SOFTWARE/DOS/WORD/EXCEL/HTML/WEBPAGE)

CONTACT HOURS: 200
MAXIMUM MARKS: 150 (INCLUDING 50% INTERNAL ASSESSMENT)

**OBJECTIVE:**
To give work experience and practical training in the topics covered in the course no. CS-401.

**INTERNAL ASSESSMENT:**
50% of total marks shall be reserved for internal assessment will be awarded by the concerned teacher on the basis of student's attendance in the lab course and two tests conducted by concerned teacher.

**INSTRUCTIONS TO EXAMINER:**
Practical examination will be conducted as per provisions of the statutes. The duration of the exam will be of 4 hours. Candidates will be required to do two practical allotted to them on spot by the examiners.
Viva will form an important part of the practical test. However its weight shall not exceed 33 percent of the marks allotted for university examinations. The viva may cover the entire practical performed by the students in the class.

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# COURSE NO. CS – 407
## TITLE: PRACTICAL II
## (PROGRAMMING WITH C++)

CONTACT HOURS: 200
MAX MARKS: 150 (50 % OF INTERNAL ASSESSMENT)

**OBJECTIVE**
To give work experience and practical training in the topics covered in theory.

**COURSE CONTENTS**
Programming with C++ based on course no. CS-403
Note: Candidates will be required to perform at least 15 practicals, practical can be added or withdrawn at any time by the department.

**INTERNAL ASSESSMENT:**
50 % of the total marks shall be reserved for internal assessment. The internal assessment will be awarded by the concerned teacher on the basis of student's attendance in the lab course and two tests conducted by the concerned teacher.

**INSTRUCTIONS TO EXAMINER:**
Practical examination will be conducted as per provisions of the statutes. The duration of the exam will be of 4 hours. Candidates will be required to do two practical allotted to them on spot by the examiners.
Viva will form an important part of the practical test. However its weight shall not exceed 33 percent of the marks allotted for university examinations. The viva may cover the entire practical performed by the students in the class.

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# COURSE NO. CS – 408
## TITLE: PRACTICAL III
## (BUSINESS DATA PROCESSING LAB)

CONTACT HOURS: 200
MAX MARKS: 150 (50 % of INTERNAL ASSESSMENT)

**OBJECTIVE:**
To give work experience and practical training in the topics covered in theory and practical handling of projects.

**COURSE CONTENTS:**
File organisation and File processing techniques team work for a reasonable size business data processing of computer programs in Visual Basic & Access based on course no. CS-405.

**INTERNAL ASSESSMENT:**
50 % of the total marks shall be reserved for internal assessment. The internal assessment will be awarded by the concerned teacher on the basis of students' attendance in the lab course and two tests conducted by the concerned teacher.

**INSTRUCTIONS TO EXAMINER:**
Practical examination will be conducted as per provisions of the statutes. The duration of the exam will be of 4 hours. Candidates will be required to do two practical allotted to them on spot by the examiners.
Viva will form an important part of the practical test. However its weight shall not exceed 33 percent of the marks allotted for university examinations. The viva may cover the entire practical performed by the students in the class.

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# COURSE NO. CS – 409

## TITLE: PROJECT WORK

CONTACT HOURS: 150 MAX MARKS: 50

**OBJECTIVE:**

To give practical experience of handling a small project of particular organisation to the logical end.

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