

**Tata Institute of Social Sciences- School of Vocational Education**

**POST GRADUATION DIPLOMA IN SOFTWARE DEVELOPMENT**

**PGDSD**



**1. Introduction**

In December 2011, Tata Institute of Social Sciences found out the varsiety of vocational training (SVE) to supply immediate and definite interventions to enhance the lives of the disadvantaged and marginalized youth, especially who are excluded by the formal school education system, through appropriate vocational education programmes. it's been found out with a vision of making an ecosystem that might bring back the dignity of labour for blue collar streams of work and make sustainable sources of income. This project has been initiated under the aegis of All India Council for Technical Education (AICTE) proposed by the Ministry of HRD, Government of India.

**1.1 Key Features:**

**Introduction and Course Objectives:**

School of vocational training offers this P.G. Diploma course of one-year duration in IT sector. This course has strong components of skill based and Work Integrated training. so as to satisfy the stress of the Industry for skilled workforce with higher qualification at the post graduate level, School of vocational training (SVE) has undertaken the task to supply this one-year Post Graduate Diploma Programme in IT sectors.

This will provide learners the chance for education and better employment after completion of their graduation programme. This course is at NSQF level 8 (Level 8-10 P.G. Diploma, Masters and research degree programme under NSQF).

The objective of this programme is to develop system programmers and analysts to satisfy the manpower requirement of fast developing software industry. The programme is meant to complement the programming and analysis ability of scholars .

The course content includes: - Advance programming Languages like JAVA, ASP.NET MVC & C#, Web development using PHP, Packages like MSOffice and management systems. It also includes the module of Mobile application development and Software project management which result in enhance their knowledge towards different phases of software project.

At the end of the each semester, the students are required to submit a project report which will represent their knowledge of understanding of the particular semester.

This programme is meant to supply a dynamic breed of computer professionals with excellent managerial skills. Emphasis is given to in-depth studies of various application - oriented subjects, covering various methodologies to develop software products efficiently by utilizing

advance networking technologies and application software.

It helps in developing software development skills in students. It'll provide an exposure of the IT Environment. This model comprises of On-the Job Training (OJT), it's quite one-on-one training located at the work site, where someone who knows the way to do a task shows another the way to perform it.

This unique program of TISS focuses on job-specific skills instead of providing only a broad based education. The aim is to enable the scholars to find out the skill by engaging in on-the-job training at real shop floor of the industry/company along side classroom theoretical training.

The Learners / students who have successfully completed graduation in any stream or equivalent course are eligible to take admission.

### 1.3. Employability/Skill enhancement

Considering the work integrated approach adopted by TISS: SVE the industry will be open to employ the students attached with them for the purpose of training as full time employees.

Undergoing the Post Graduation Diploma in Software Development will give the students, an upper hand in comparison to others as they will receive additional specialized training as follows:

- Basic understanding of computer and its terminology
- Manage, co-ordinate and resolve incidents as quickly as possible at primary support level
- Problem-solving approaches in different situations
- Select appropriate technology to use to develop any given application
- Background knowledge of programming languages such as JAVA, C#, etc
- Work effectively with colleagues, either in your own work group or in other work groups within your organization
- Analyze inputs from appropriate people to identify, resolve and record design defects and inform future designs
- Develop basic programming structures to implement functionality
- Develop understanding of Big Data analytics

## 2. Semester wise Distribution of Credits

Semester wise Credit distribution of Credits						
Semester	Vocational Theory Credits	Vocational Theory Hours	Vocational Practical Credits	Vocational Practical Hours	Total Credits	Total Hours
Semester 1	8	120	12	360	20	480
Semester 2	8	120	12	360	20	480
<b>Total</b>	<b>16</b>	<b>240</b>	<b>24</b>	<b>720</b>	<b>40</b>	<b>960</b>

Theory	1 credit=15 hours
Practical	1 credit= 30 hours

### 3. Course Structure

Number of Credits - 40

Duration of Course –960 Hours

Total number of Semesters – 2

Subject Code	Topic/Module	Credits	Duration (Hrs)	Key Learning Outcomes
<b>SEMESTER-I</b>				
PGDSD101	Advance Computing and MS Office	2	30	<ul style="list-style-type: none"> <li>Understand the functions, characteristics &amp; components of a computer system</li> <li>Understand operating system &amp; file system basics</li> <li>Incorporate &amp; use advanced features in MS Word</li> <li>Working with multiple workbooks</li> <li>Perform simple arithmetic calculations directly in a cell as well as by referring to another cell</li> <li>Use Excel functions to calculate mean, median, standard deviation, minimum and maximum values</li> <li>Break a complex problem into steps and solve it using Excel</li> <li>Summarize information quickly and generate Management Reports</li> <li>Design presentations using text, graphics, images, tables and charts</li> </ul>
PGDSD102	Database management systems	2	30	<ul style="list-style-type: none"> <li>Understand concepts of database management systems.</li> <li>Gain knowledge for the oracle and SQL &amp; PL/SQL.</li> <li>Working with the basic and</li> </ul>

				<p>advance functions of database in programming.</p> <ul style="list-style-type: none"> <li>• Working with the various data models and keys.</li> <li>• Gain knowledge about MS access.</li> </ul>	4
PGDSD103	Object oriented programming with JAVA	2	30	<ul style="list-style-type: none"> <li>• Understand basics of Java Programming language.</li> <li>• Gain knowledge for the various concepts of JAVA programming.</li> <li>• Understand basics structure of JAVA program.</li> <li>• Gain knowledge about operators and statements of JAVA.</li> <li>• Gain knowledge about class, inheritance and arrays in Java.</li> <li>• Create applets using Java.</li> </ul>	
PGDSD104	Web Development using PHP	2	30	<ul style="list-style-type: none"> <li>• Develop web page using PHP.</li> <li>• Knowledge about functions and variables used in PHP.</li> <li>• Functional knowledge of Error handling in PHP.</li> <li>• Knowledge about working with forms and database connectivity using PHP</li> </ul>	
PGDSD-OJT1	Internship/OJT	10	300	<p>Internship/OJT should provide an opportunity for students to:</p> <ul style="list-style-type: none"> <li>• Experience the discipline of working in a professional engineering organisation</li> <li>• Develop understanding of the functioning and organisation of a business</li> <li>• Interact with other professional and non-professional groups</li> <li>• Understand the functions, characteristics &amp; basic components of a computer system.</li> <li>• Know-how of various</li> </ul>	

				peripherals, storage devices & understand their physical structure & working <ul style="list-style-type: none"> <li>• Develop web page using PHP</li> </ul>	5
PGDSD-PW1	Project Work	2	60	<p>The students are required to submit a project report which will represent their knowledge of understanding of this semester.</p> <p>Student must be capable of working and explaining any one of the below mentioned technologies/framework that he/she learnt during this semester.</p> <ul style="list-style-type: none"> <li>➤ Working of Operating System- Windows</li> <li>➤ Object oriented programming with Java</li> <li>➤ How Database Management System works</li> <li>➤ Website development and modification using PHP programming languages</li> </ul>	
<b>SEMESTER-II</b>					
PGDSD201	ASP.NET MVC & C#	2	30	<ul style="list-style-type: none"> <li>• Describe the core syntax and features of C#.</li> <li>• Create and call methods, catch and handle exceptions, and describe the monitoring requirements of large-scale applications</li> <li>• Describe the Microsoft Web Technologies stack and select an appropriate technology to use to develop any given application.</li> <li>• Design the architecture and implementation of a web application that will meet a set of functional requirements, user interface requirements, and address business models.</li> <li>• Create MVC Models and write code that implements business</li> </ul>	

				logic within Model methods, properties, and events.	6
PGDSD202	Android Mobile Application Development	2	30	<ul style="list-style-type: none"> <li>• Use the development tools in the Android development environment</li> <li>• Use the major components of Android API set to develop their own apps</li> <li>• Use the Java programming language to build Android apps</li> <li>• Make UI-rich apps using all the major UI components</li> <li>• Store and manipulate data using Content Providers, Shared Preferences and Notifications</li> <li>• Do background processing with Services and AsyncTasks</li> </ul>	
PGDSD203	Software Engineering and Project Management	2	30	<ul style="list-style-type: none"> <li>• Understand and explain the importance of software project planning.</li> <li>• Impart functional knowledge about design methods of software.</li> <li>• Knowledge about S/W Quality Assurance and computer aided s/w engineering.</li> <li>• Be familiar with the use of Project Management Tool.</li> </ul>	
PGDSD204	Big Data Hadoop	2	30	<ul style="list-style-type: none"> <li>• Understand Big Data and Hadoop ecosystem</li> <li>• Work with Hadoop Distributed File System (HDFS)</li> <li>• Master the concepts of HDFS and MapReduce framework</li> <li>• Hadoop Configuration and installation</li> <li>• Setting up Pseudo node and Multi node cluster on Amazon EC2</li> <li>• Master HDFS, MapReduce, Hive, Pig, Oozie, Sqoop, Flume, Zookeeper, HBase</li> </ul>	

				<ul style="list-style-type: none"> <li>• Detailed understanding of Big Data analytics</li> <li>• Hadoop testing applications using MR Unit and</li> <li>• Practice real-life projects using Hadoop and Apache Spark</li> </ul>	7
PGDSD-OJT2	Internship/OJT	10	300	<p>Internship/OJT should provide an opportunity for students to:</p> <ul style="list-style-type: none"> <li>• Experience the discipline of working in a professional engineering organisation</li> <li>• Develop understanding of the functioning and organisation of a business</li> <li>• Understand the features &amp; architecture of MVC framework</li> <li>• Work with MVC language</li> <li>• Understand concepts of database management systems</li> <li>• Detailed understanding of Big Data analytics</li> <li>• Practice real-life projects using Hadoop and Apache Spark</li> </ul>	
PGDSD-PW2	Project Work	2	60	<p>The students are required to submit a project report which will represent their knowledge of understanding of this semester.</p> <p>Student must be capable of working and explaining any one of the below mentioned technologies/framework that he/she learnt during this semester.</p> <ul style="list-style-type: none"> <li>➤ Web application development with the advance programming languages and framework; C# and MVC</li> <li>➤ Concept of software engineering and project management</li> </ul>	

				<ul style="list-style-type: none"> <li>➤ Hadoop Configuration and installation</li> <li>➤ Handling and usage of Big Data Hadoop</li> <li>➤ Androidbased mobile application development</li> </ul>	8
<b>Total</b>		40	960		

**4. Method of Teaching:**

**A. For Theory Based Teaching:**

Class room teaching and demonstration, learner will actively be involved in learning by giving assignments, participating in symposium

**B. For Practical Based Teaching:**

This part of the PGSD will be delivered extensively by engaging students with the industries of the sector.

**5. Assessment Criteria:**

The Skill component of the course will be assessed and certified by the School of Vocational Education-Tata Institute of Social Sciences.

P.G. Diploma Programme as per NSQF guidelines will be of Level -8

1. Each P.G. Diploma will consist of 40 credits divided in to two semesters.
2. Theory and skill based component for P.G. diploma programme are divided in 40:60 ratios.
3. Theory parts credit refers to a unit by which the course work is measured and
4. Number of hours of instructions required per week.
5. One theory credit is equivalent to 15 hours of teaching (lecture or tutorial) and one practical credit is equivalent to 30 hours of practical work/field work. i.e. 1:15 and 1:30 resp.



### 5.1 Theory Component

The theoretical component is supported the syllabus approved by the respective sector and approved by the academic Council of the University. It's divided into four courses each of two credits and 50 marks. Examination for 70% marks are going to be conducted by SVE at the top of every semester (Examination are going to be conducted for 100 marks and converted to 70 Marks), assessment for 30% marks are allotted by institute by conducting two tests each of 20 marks per course and average of both tests taken, if tests are conducted quite 20 marks then these are converted to twenty marks and 10 marks are allotted to the work book completed during the course of every semester.

### 5.2 Skill Component

The skill component for P.G. diploma programme is total of 12 credits and 300 marks divided into (Internship / or On Job training) for 10 credits (250 marks) and project report/ case study/ research/survey etc. are for 02 credits (50 marks).

The assessment and evaluation and marks distribution of the skill based component is carried out as per rules and guidelines framed in a below given table. Assessment of the Skill component is carried out by Internal examiner (50%) marks and External examiner (50% marks) as per the given guidelines. The internship part is jointly assessed by the supervisor / trainer and external examiner appointed by SVE. Similarly, the Project Report assessment work is assessed by coordinating guide/ supervisor and external examiner simultaneously.

Note: The institute can modify the internship /on job training and project report as per the need of the sector e.g. Life Support Services, Health Care Services as per the need and requirements of the sector, however the credits and weightage will remain the same. This will ascertain the uniformity of the programme over all sectors. Accordingly, variation in assessment pattern is changed and permitted within the frame work.

**DETAILED SYLLABUS****SEMESTER 1****COURSE TITLE: PGDSD101 - ADVANCE COMPUTING AND MS OFFICE****Credits: 2****Total Credit Hours: 30**

Introduction- What is Central Processing Unit, Arithmetic and Logic Unit, Control Unit, Registers, Instruction set, Processor Speed, Input and Output Devices. What is a program?, Programming Languages , Introduction, Data, information And Knowledge, Programming development cycle

Management Information System (MIS), Fields of Information System, Impact Of MIS, Designing An MIS, Placement Of MIS, Views Of MIS, Pitfalls In Designing an MIS, Introduction to Windows, Advance features of Windows -Managing Hardware & Software, Add or remove Hardware devices to/from computer, Add/remove programs

Communication – Setting up Dial up Networking with Windows, Internet connection with Windows, Direct Cable Connection, Setting up TCP/IP properties, Hyper Terminal, Understanding OLE, Embed/Link Using Cut and Paste and Embed/Link Using Insert Object - Manage Embedded/Linked Object

MS Office and its Components- Introduction to MS Office; MSWord Creating a New Document; Saving document, Saving as different format, Different Page Views and layouts; Applying various Text Enhancements; Advanced Features-Working with section breaks and page breaks, Working with Columns, Tabs & Indents; Creation & Working with Tables including conversion to and from text; Margins & Space management in Document; Adding References – footnotes, endnotes, and Table of contents, Insert drawing, Mail Merge, Envelops & Mailing Labels, protect and secure documents in MS Word, Working in different languages in MS Word. Using Unicode in MS Word, Insert WordArt and other objects like shapes, clipart, charts and SamrtArts, symbol in Document. Using Macros in Word- Record, edit and run macros.

MS Excel: Introduction and area of use; Working with MS Excel; concepts of Workbook & Worksheets; Using Wizards; Various Data Types; Using different features with Data, Cell and Texts; Inserting, Removing & Resizing of Columns & Rows; Working with Data & Ranges; Different Views of Worksheets; Zooming, Column Freezing, Labels, Hiding, Splitting etc.; Using different features with Data and Text; Use of Formulas, Calculations using various type of functions-Logical, string, date & time, math and other types; Working with Different Chart Types; Printing of Workbook & Worksheets with various options. Import and export excel sheets to/from various format, add headers and footers, using macros in excel sheet- Record, edit and run macros.

MICROSOFT POWER POINT AND ITS FEATURES- Introduction, Create a New Presentation, View of Presentation – Slide Show View, Designing of a Presentation, Write

PCTI Ltd.

**COURSE TITLE: PGDSD102 - DATABASE MANAGEMENT SYSTEMS****Credits: 2****Total Credit Hours: 30**

Operational data, Purpose of database system, Views of data, Data models: Relational, Network, Hierarchical, Instances & Schemes, Data Dictionary, Types of Database languages : DDL, DML, Entity Relationship Model as a tool of conceptual design : Entities & Entity set, Relationship & Relationship set, Attributes, Mapping Constraints, Keys, Entity-Relationship diagram (E-R diagram) : Strong & weak entities, Generalization, Specialization, Aggregation, Reducing ER diagram to tables

Concepts of Keys: Candidate key, Primary Key, Alternate Key, Super Key, Foreign Key, Fundamental integrity rules: Entity integrity, Referential integrity.

Different types of joins i.e. theta join, equi join, natural join, outer join, set operations. Structured query language(SQL), Codd's rules, Functional Dependencies, Good & Bad Decomposition, Anomalies as a database: A consequences of bad design, Universal Relation, Normalization: First, Second, Third & BCNF Normal Forms, Multivalued Dependency, Join Dependency & forth Fifth Normal Form

Popular RDBMS available in the market, Introduction to MS Access, Creating Databases using MS Access, Creating and Using Tables in MS Access, modifying tables in Access, Query in MS Access, Creating and using reports in MS Access, Printing Reports in MS Access, Importing and exporting in MS Access,

Oracle introduction, Client and server communication (SQL) Data Definition Language (DDL) - Creating, Altering & Dropping Tables, Oracle Data Types, Integrity Constant, Data Manipulation Language (DML) - Select Insert, Update, Delete Commands, Sorting in oracle, Joins in Oracle-Inner,Outer, Cartesian, Self-join, Non-equi joins, Transaction Control Using ,SQL - Commit, Rollback, Save point Command, Data Controlling Using SQL - Grant, Revoke, Set Role, SQL functions, Indexes and views

PL/SQL, SQL & PL/SQL, Differences, Blocking Code for Clarity, Using Variables, Constant and Data Types, Assigning Data Base Values to Variables, Select into .... Cursors using Flow Control and Loop Statements, Goto Statement. Error handling built in PL / SQL Exceptions, User - Defined Exceptions, Unhandled

Exception, the Raise - Application - Error Procedure. PL / SQL Programs Anonymous PL / SQL Blocks, Stored Procedure,

Function & Packages, Using Database Triggers

**COURSE TITLE: PGDSD103 - OBJECT ORIENTED PROGRAMMING WITH  
JAVA**

13

**Credits: 2****Total Credit Hours: 30**

C++ Vs JAVA, JAVA and Internet and WWW, JAVA support systems, JAVA environment. JAVA program structure, Tokens, Statements, JAVA virtual machine, Constant & Variables, Data Types, Declaration of Variables, Scope of Variables, Symbolic Constants, Type Casting. Operators: Arithmetic, Relational, Logical Assignments, Increment and Decrement, Conditional, Bitwise, Special, Expressions & its evaluation. If statement, if...else... statement, Nesting of if...else... statements, else...if Ladder, Switch, ? operators, Loops – While, Do, For, Jumps in Loops, Labelled Loops.

Defining a Class, Adding Variables and Methods, Creating Objects, Accessing Class Members, Constructors, Methods Overloading, Static Members, Nesting of Methods. Inheritance: Extending a Class, Overriding Methods, Final Variables and Methods, Final Classes, Finalize Methods, Abstract methods and Classes, Visibility Control.

Arrays: One Dimensional & two Dimensional, strings, Vectors, wrapper Classes, Defining Interface Extending Interface, Implementing Interface, Accessing Interface Variable, System Packages, Using System Package, Adding a Class to a Packages, Hiding Classes.

Creating Threads, Extending the Threads Class, Stopping and Blocking a Thread, Life Cycle of a Thread, Using Thread Methods, Thread Exceptions, Thread Priority, Synchronization, Implementing the Runnable Interface.

Local and Remote Applets Vs Applications, Writing Applets, Applets Life Cycle, Creating an Executable Applet, Designing a Web Page, Applet Tag, Adding Applet to HTML File, Running the Applet, Passing Parameters to Applets, Aligning the Display, HTML Tags & Applets, Getting Input from the User.

**COURSE TITLE: PGDSD104 - WEB DEVELOPMENT USING PHP****Credits: 2****Total Credit Hours: 30**

Introduction to PHP as a programming Language: - Advantages of PHP, the server side architecture Decomposed, overview of PHP, history, object oriented support, benefits in running PHP as a server side script. Installing a web server, Internet information server, and IIS installation, testing web server setup.

The basics of PHP: - data types, variables, constants, operators, Arrays, Conditional statements (if statement, Executing Multiple Statements, else if clause and switch statement), Iterations (for loop, while loop, controlling an array using a while loop, do while statement, for each loop and special loop key words)

Functions, user defined functions, functions with arguments, built in functions( print(), includer(), header(), phpinfo() ), PHP server Variables, working with date and time , performing mathematical operations , working with string functions . System Variable (GET, POST, cookies& Session, Forums)

Working with forms, form elements (Text Box, Text Area, Password, Radio Button, Checkbox, The Combo Box, Hidden Field and image), adding elements to a form, uploading files to the Web Server using PHP, building a challenge and response subsystem and understanding the functionality of the FORM attribute Method Regular Expressions: - Engine, types of Regular Expressions, symbols used in Regular Expressions. Error handling in PHP: - Displaying errors, warnings, types of errors, error levels in PHP, logging Errors and Ignoring errors.

Data base connectivity using PHP (MySQL, ODBC, ORACLE, SQL) Performing, executing Commands, different types of Data Base Operations like Insertion, deletion, update and query on data

**COURSE TITLE: PGDSD-OJT1 - INTERNSHIP/OJT**

**Credits: 10**

**Total Credit Hours: 300**

Internship/OJT should provide an opportunity for students to:

- Experience the discipline of working in a professional engineering organisation
- Develop understanding of the functioning and organisation of a business
- Interact with other professional and non-professional groups
- Understand the functions, characteristics & basic components of a computer system.
- Know-how of various peripherals, storage devices & understand their physical structure & working
- Develop web page using PHP

**COURSE TITLE: PGDSD-PW1 - PROJECT WORK****Credits: 2****Total Credit Hours: 60****Objective**

The objective of project is to measure the performance of the students.

**Timeline and Instructions:**

Each student has to complete a project at the end of both semesters. Actual time allotted for project is 60 hours. As far as possible individual projects are to be allotted to students. However, in case of larger project two or three student can work in a group. In such a case each student should work on a separate or distinct module. Student should submit the project individually. The project report submitted by the student shall be evaluated separately by the internal guide and the external examiner appointed by the university.

**Outcomes**

The students are required to submit a project report which will represent their knowledge of understanding of this semester.

Student must be capable of working and explaining any one of the below mentioned technologies/framework that he/she learnt during this semester.

- Working of Operating System- Windows
- Object oriented programming with Java
- How Database Management System works
- Website development and modification using PHP programming languages

**COURSE TITLE: PGDSD201– ASP.NET MVC & C#****Credits: 2****Total Credit Hours: 30****BASICS OF C# PROGRAMMING**

**OVERVIEW:** Strong Programming Features of C#; **ENVIRONMENT:** The .Net Framework, Integrated Development Environment (IDE) for C#, writing C# Programs on Linux or Mac OS.

**BASIC SYNTAX:** The *using* Keyword, The *class* Keyword, Comments in C#, Member Variables, Member Functions, Instantiating a Class, Identifiers, C# Keywords

**DESCRIPTORS AND DEFINITIONS:** Data Types, Type Conversion, Variables, Constants and Literals, Operators, Decision Making, Loops, Encapsulation, Methods, Arrays, Strings, Structures, Classes, Inheritance, Polymorphism, Operator Overloading, Interfaces, Exception Handling And Collections.

### ASP.NET MVC

**OVERVIEW:** History, Why Asp.Net MVC?, Benefits Of Asp.Net MVC , Environment Setup , Installation, Getting Started, Create Asp.Net MVC Application, Add Controller

**LIFE CYCLE:** The Application Life Cycle, The Request Life Cycle, Routing, Understanding Routes, Custom Convention, Controllers, Actions, Request Processing, Types Of Action, Add Controller

**FILTERS & SELECTORS:** Action Filters, Types Of Filters, Apply Action Filter, Custom Filters, Actionname, Nonaction, Actionverbs, Views, Data Model, Helpers Model Binding, Databases; Validation: Dry, Adding Validation To Model; Security: Authentication, Authentication Options, Authorization, Bootstrap

**CACHING:** Why Caching?, Varying the Output Cache, Cache Profile; DATA NOTATIONS: Key, Timestamp, ConcurrencyCheck, Required MaxLength.MinLength, Table IndeForeignKey, NotMapped, InverseProperty, SELF-HOSTING: Deploy using File System.

## **COURSE TITLE: PGDSD202 – ANDROID MOBILE APPLICATION DEVELOPMENT**

**Credits: 2**

**Total Credit Hours: 30**

Android Introduction, Smartphones future, Preparing the Environment, Installing the SDK, Creating Android Emulator, Installing and Using Eclipse, Installing Android Development Tools, Choosing which Android version to use

Android Architecture, Android Stack, Android applications structure

Creating a project, Working with the AndroidManifest.xml, Using the log system Activities

Introduction to UI – Layouts, Fragments, Adapters, Action bar, Dialogs, Notifications , UI best practices

UI Architecture, Application context, Intents, Activity life cycle, Supporting multiple screen sizes

Designing User Interface Using Views – Basic Views- TextView, Button, ImageButton, CheckBox,ToggleButton, RadioButton etc., ProgressBar View and AutoCompleteTextView,



TimePicker and DatePicker View, ListView, ImageView, ImageSwitcher and GridView, DigitalClock & AnalogClock Views  
 Notification and Toast, Parameters , on Intents, Pending intents, Status bar notifications  
 Toast notifications  
 Menus, Localization, Options menu, Context menu  
 Dialogs-Alert dialog, Custom dialog, Dialog as Activity  
 Orientation and Movement- Pitch, roll and yaw, Natural device orientation, Reference frame remapping  
 SMS - Sending and Receiving  
 Working with Media –Playing audio and video, Recording audio and video

Location and Maps - Google maps, Using GPS to find current location  
 Working with data storage - Shared preferences, Preferences activity, Files access, Using External storage, SQLite database  
 Animation-View animation, Drawable animation  
 Working with Sensors- Finding sensors, Accelerometers, Gyroscopes, Other types  
 Working with Camera – Controlling the camera, Preview and overlays, Taking pictures

Content providers- Content provider introduction, Query providers  
 Network Communication - Web Services, HTTP Client, XML and JSON, Using e-mails.  
 Services - Service lifecycle, Foreground service, Creating own services  
 Publishing and Distributing Your App -Preparing for publishing, Google Play requirements, Signing and preparing the graphics, Publishing to the Android Market, Monetization, Tips on becoming a top app, Google analytics

**COURSE TITLE: PGDSD203– SOFTWARE ENGINEERING AND PROJECT MANAGEMENT**

**Credits: 2**

**Total Credit Hours: 30**

**SOFTWARE :** Software Characteristics, Components & Applications, Software Engineering - A Layered Technology, Software Process Models - Linear Sequential Model, Prototype & Rad Model., Evolutionary Software Process Model – Incremental Model and Spiral Model.

**SOFTWARE PROJECT MANAGEMENT:** Project Management Concepts – People Problem and Process S/W process and Project Metrics : Metrics in The Process and Project Domains . Software Measurement –Size Oriented, Function Oriented Metrics, Extended Function

**SOFTWARE PROJECT PLANNING:** Objectives, Scope, Project Estimation, Decomposition Techniques, Empirical Estimation Models.

**ANALYSIS CONCEPT AND PRINCIPLES:** Requirement Analysis, Communication Techniques, Analysis Principles, Software Prototyping, Specifications.

**ANALYSIS MODELING:** Elements of The Analysis Modeling, Data Modeling. Functional Modeling and Information Flow, Behavioral Modeling, Data Dictionary.

**DESIGN CONCEPTS AND PRINCIPLES:** Design Process, Design Concepts, Design Principles, Effective Modular Design .

**DESIGN METHODS :** Architectural Design Process, Transform Mapping and Transaction Mapping, Interface Design, - Internal and External Design, Human Computer Interface Design, Interface Design Guidelines, Procedural Design.

**Software Project Scope:** Need to scope a software project, scope management process, communication techniques and tools, communication methodology

**Software Requirement Gathering and Resource allocation:** Requirement specifications, SRS Document preparation, Resources types for a software projects, requirement for resources allocation.

**Software Project Estimation:** Work Breakdown structure (WBS), steps in WBS, Measuring efforts for a project, techniques for estimation – SLOC, FP, COCOMO and Delphi methods.

**Project Scheduling:** Scheduling and its need, scheduling basics, Gantt Chart, Network scheduling techniques, Pert and CPM

**Using a Project Management Tool:** Introduction to MS Project 2000, Managing tasks in MS Project 2000, Tracing a project plan, creating and displaying project information reports.

## **COURSE TITLE: PGDSD204 – BIG DATA HADOOP**

**Credits: 2**

**Total Credit Hours: 30**

**BIG DATA OVERVIEW-** What is Big Data?, What Comes Under Big Data?, Benefits of Big Data, Big Data Technologies, Operational vs. Analytical Systems, Big Data, Challenges

**BIG DATA SOLUTIONS-** Traditional Enterprise Approach, Google's Solution, Hadoop,

**INTRODUCTION TO HADOOP-** Hadoop Architecture, MapReduce, Hadoop Distributed File System, How Does Hadoop Work?, Advantages of Hadoop

**ENVIRONMENT SETUP-** Pre-installation Setup, Installing Java, Downloading Hadoop, Hadoop Operation Modes, Installing Hadoop in Standalone Mode, Installing Hadoop in Pseudo Distributed Mode, Verifying Hadoop Installation,

**HDFS OVERVIEW-** Features of HDFS, HDFS Architecture, Goals of HDFS,

**HDFS OPERATIONS-** Starting HDFS, Listing Files in HDFS, Inserting Data into HDFS, Retrieving Data from HDFS, Shutting Down the HDFS

**COMMAND REFERENCE-** HDFS Command Reference

**MAPREDUCE-** What is MapReduce?, The Algorithm, Inputs and Outputs (Java Perspective), Terminology, Example Scenario, Compilation and Execution of Process Units Program, Important Commands, How to Interact with MapReduce Jobs

**STREAMING-** Example using Python, How Streaming Works, Important Commands

**MULTI-NODE CLUSTER-** Installing Java, Creating User Account, Mapping the nodes, Configuring Key Based Login, Installing Hadoop, Configuring Hadoop, Installing Hadoop on Slave Servers, Configuring Hadoop on Master Server, Starting Hadoop Services, Adding a New DataNode in the Hadoop Cluster, Adding a User and SSH Access, Set Hostname of New Node, Start the DataNode on New Node, Removing a DataNode from the Hadoop Cluster

### **COURSE TITLE: PGDSD-OJT2 - INTERNSHIP/OJT**

**Credits: 10**

**Total Credit Hours: 300**

The students are required to submit a project report which will represent their knowledge of understanding of this semester.

Student must be capable of working and explaining any one of the below mentioned technologies/framework that he/she learnt during this semester.

- Experience the discipline of working in a professional engineering organisation
- Develop understanding of the functioning and organisation of a business
- Understand the features & architecture of MVC framework
- Detailed understanding of Big Data analytics
- Practice real-life projects using Hadoop and Apache Spark
- Work with MVC language
- Understand concepts of database management systems

### **COURSE TITLE: PGDSD-PW2 - PROJECT WORK**

**Credits: 2**

**Total Credit Hours: 60**

#### **Objective**

The objective of project is to measure the performance of the students.

#### **Timeline and Instructions:**

Each student has to complete a project at the end of both semesters. Actual time allotted for project is 60 hours. As far as possible individual projects are to be allotted to students. However, in case of larger project two or three student can work in a group. In such a case each student should work on a separate or distinct module. Student should submit the project individually. The project report submitted by the student shall be evaluated separately by the internal guide and the external examiner appointed by the university.

**Outcomes**

The students are required to submit a project report which will represent their knowledge of understanding of this semester.

Student must be capable of working and explaining any one of the below mentioned technologies/framework that he/she learnt during this semester.

- Web application development with the advance programming languages and framework; C# and MVC
- Concept of software engineering and project management
- Android based mobile application development
- Hadoop Configuration and installation
- Handling and usage of Big Data Hadoop

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## Reading Lists &amp; References

Subject Code	Subject	Reference Books
PGDSD101	Advance Computing and Operating System- Windows	<ul style="list-style-type: none"> <li>• Fundamentals of Computers Paperback, Reema Thareja, Oxford, 2014</li> <li>• Computer Fundamentals, Kogent Learning Solutions Inc., Dreamtech Press</li> <li>• Fundamentals of Computers and Information System, Niranjan Shrivastava, KLSI, Dreamtech Press</li> <li>• Windows 8 Absolute Beginner's Guide, Paperback, Paul Sanna, Pearson Education</li> <li>• Windows 8.1 In Depth, Brian Knittel, Pearson Education</li> <li>• Computer Course : Windows 7 and Office 2010, Ravikant Taxali, Tata McGraw Hill</li> <li>• Computer Course : Windows 7 and Office 2010, Ravikant Taxali, Tata McGraw Hill</li> <li>• Office 2013 All-In-One Absolute Beginner's Guide, Paperback, Patrice-Anne Rutledge, Pearson Education</li> <li>• Microsoft Office 2010: On Demand, Paperback, Steve Johnson , Pearson Education</li> </ul>
PGDSD102	Database management systems	<ul style="list-style-type: none"> <li>• "DATABASE MANAGEMENT SYSTEM" by Leon &amp; Leon, Vikas Publications</li> <li>• Oracle Database 12c- Hands on SQL and PL/SQL by Ashis Asnani, PHI</li> <li>• "DATABASE SYSTEM CONCEPTS" by Henry F.Korth &amp; Abraham Silberschatz</li> <li>• "AN INTRODUCTION TO DATABASE SYSTEM" by Bipin C.Desai</li> <li>• "Database Management and Oracle Programming" 2nd Edition By S. S. Khandare , S. Chand Publisher</li> <li>• "Oracle A Beginners Guide" by Michael Abbey &amp; Michael J. Corey TMH Publications</li> </ul>
PGDSD103	Object oriented programming with JAVA	<ul style="list-style-type: none"> <li>• E. Balaguruswamy, "Programming in Java", 2nd Edition, TMH Publications</li> <li>• Peter Norton, "Peter Norton Guide to Java Programming", Techmedia Publications</li> </ul>
PGDSD104	Web Development using PHP	<ul style="list-style-type: none"> <li>• PHP: The Complete Reference by Steven Holzner (Author)</li> <li>• Programming Php, Publisher: Shroff - O'Reilly, Sold By: Orange books</li> </ul>

<p>PGDSD201</p>	<p>Web application development with ASP.NET MVC &amp; C#</p>	<ul style="list-style-type: none"> <li>• Learn ASP.NET MVC by Arnaud Weil</li> <li>• Professional ASP.NET MVC 5 by Jon Galloway</li> <li>• ASP.NET MVC 5 with Bootstrap and Knockout.js: Building Dynamic, Responsive Web Applications by Jamie Munro</li> <li>• The C# Player's Guide (2nd Edition) by RB Whitaker</li> <li>• Pro ASP.NET MVC 5 (Expert's Voice in ASP.Net) by Adam Freeman</li> <li>• ASP.NET Core 1.1 For Beginners: How to Build a MVC Website Jonas Fagerberg</li> <li>• <a href="https://www.asp.net/mvc">https://www.asp.net/mvc</a></li> <li>• <a href="https://en.wikipedia.org/wiki/ASP.NET_MVC">https://en.wikipedia.org/wiki/ASP.NET_MVC</a></li> <li>• <a href="https://www.tutorialspoint.com/mvc_framework/">https://www.tutorialspoint.com/mvc_framework/</a></li> </ul>
<p>PGDSD202</p>	<p>Android Mobile Application Development</p>	<ul style="list-style-type: none"> <li>• Beginning Android Application Development by Wei-Meng Lee, Wiley India.</li> <li>• Android Programming: The Big Nerd Ranch Guide (Big Nerd Ranch Guides) Bill Philips &amp; Brian Hardy</li> <li>• Android Design Patterns: Interaction Design Solutions for Developers(By: Greg Nudelman )</li> <li>• Android User Interface Design: Turning Ideas and Sketches into Beautifully Designed Apps (By: Ian G. Clifton</li> </ul>
<p>PGDSD203</p>	<p>Software Engineering and Project Management</p>	<ul style="list-style-type: none"> <li>• Software Engineering By R.S.Pressman</li> <li>• An Integrated Approach To Software Engineering By Pankaj Jalote</li> <li>• Software Testing Tools: Covering WinRunner, Silk Test, LoadRunner, JMeter and TestDirector with case By Dr. K.V.K.K. Prasad, ISBN: 8177225324, Wiley Dreamtech, List Price: Rs. 279.00 <a href="http://www.columbia.edu/~jm2217/">http://www.columbia.edu/~jm2217/</a></li> <li>• Basics of Software Project Management – By NIIT,, Prentice Hall of India, ISBN 81-203-2490-0</li> <li>• Software Project Management by Bob Hughes &amp; mike Cotterell, Tata McGraw Hill , ISBN – 0-07-061985-9</li> </ul>
<p>PGDSD204</p>	<p>Big Data Hadoop</p>	<ul style="list-style-type: none"> <li>• Hadoop in Practice by Alex Holmes</li> <li>• Hadoop For Dummies by Dirk De Roos</li> <li>• Big Data Analytics with R and Hadoop by Vignesh Prajapati</li> <li>• Professional Hadoop Solutions by Alexey Yakubovich, Boris Lublinsky, and</li> </ul>

		<ul style="list-style-type: none"><li>• Kevin B Smith</li><li>• Learning Spark: Lightning-Fast Big Data Analysis <sup>23</sup> by Andy Konwinski, Holden Karau, Matei Zaharia, and Patrick Wendell</li><li>• <a href="https://www.javatpoint.com/hadoop-tutorial">https://www.javatpoint.com/hadoop-tutorial</a></li><li>• <a href="https://www.tutorialspoint.com/hadoop/">https://www.tutorialspoint.com/hadoop/</a></li><li>• <a href="https://www.cloudera.com/more/training/library/tutorials.html">https://www.cloudera.com/more/training/library/tutorials.html</a></li></ul>
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**Assessment Criteria for Internship/ on Job Training and projects for P.G. Diploma's****Internship and On Job Training (10 Credits 250 marks) Skill based component.**

Each learner will be assessed based on following scheme and required to prepare a detailed plan within 15 days of joining the internship/OJT and Project in consultation with Supervisor/Trainer/Co-ordinator.

1. At the end of the internship, Supervisor/Trainer/Co-ordinator will prepare a write up on achievements of the goals mentioned in the detailed plan and also their reflections.
2. Each student will be required to maintain the diary in which daily /weekly activities will be recorded. This will be sent to Supervisor/Trainer/Co-ordinator and department advisor on weekly basis.
3. At the end of the internship student will submit a report in about 2000-2500 words.
4. Evaluation of internship/OJT will be done internally and externally. (10 credits).

Following will be the criterion for Internal assessment

**Parameters of Assessment criteria.**

**Punctuality:** remains present for all working days, goes to work on time and remains at work for the required duration

**Sincerity:** works hard to meet the quality requirement of the organisation, prepared to put in extra efforts to complete the given task.

**Initiative:** prepared to try new ways of doing existing task, identifies obstacles-makes persistent efforts to overcome the barriers.

**Commitment:** Displays work oriented life goals, makes client and customers their priority, has a clear understanding of her job responsibilities and fulfils those to the best of their ability.

**Attitude towards profession:** Takes responsibility for the own actions, improves herself through self-learning receptive to new ideas, ready to take new challenges, accepts constructive criticism demonstrates trustworthiness, treats seniors, peers and juniors of all class/caste with respect, dresses appropriately, comes prepared for work.

**Skills**

**Communication:** written and oral, displays good manners and etiquettes

**Documentation:** Prepared the relevant documents and preserves them systematically

**Reporting:** reports to the higher authorities of organisation work done by her in appropriate manner.

Any other: Each P. G. Diploma program has specified skills and abilities are developed at the end and are assessed based on

- ❖ Plan for Internship including goals of internship
- ❖ Achievement of goals (reflections and Performa)



- ❖ Diary: Daily/weekly reports of activities
- ❖ Following will be the criterion for assessment done jointly
- ❖ Report of internship
- ❖ Viva voce

(For the batch of 10 students' There will be one coordinator / supervisor, who will assign them and will monitor on Daily/ weekly basis.)

### **Project (02 Credits 50 marks)**

The students/ learner will carry out one project under the guidance of course coordinator or supervisor for 02 credits and 50 marks for which the assessment is based on one of the following.

project title / case study/ Research /survey etc.

After completion of Project/ research/ case study etc. each student will submit the report of 50-60 pages (12000-15000 words)

(The font and format for presentation of the thesis separate guidelines will be issued.)

Evaluation of research project will be conducted internally and externally

Each report will be evaluated by the coordinator guide and external referee

Following will be criterion for Internal and External assessment: (100 marks)

- |   |            |
|---|------------|
| 1. Project Work/ Case study<br>(General – Need, Parameters, Applicability etc.) | (30 marks) |
| 2. Project Report   | (30 Marks) |
| 3. Viva - Voce  | (30 Marks) |
| 4. Presentation.  | (10 Marks) |

The Internal and External Examiners will assess learner on their internship and project Report jointly.

**Evaluation Report**

**Name of The Student** \_\_\_\_\_

**Programme**\_\_\_\_\_ **Semester**\_\_\_\_\_ **Seat No**\_\_\_\_\_

**Place of Internship/ Training Centre**\_\_\_\_\_

**Title of the Project**\_\_\_\_\_

**Name of the coordinator/ supervisor.** \_\_\_\_\_

**Marks obtained** \_\_\_\_\_ **out of** \_\_\_\_\_

**Signature and Name  
Examiner**

**Signature and Name External  
Internal Examiner**

**Place:  
and Signature**

**Seal of the Institute**

**Date:**

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## Guidelines for Evaluation of Internship/On Job Training &amp; Project Report

27

Sr.No.	Types of Evaluation	Criteria for Evaluation	Marks Obtained	Total
01	Internal Assessment (25 Marks)	<b>A) Internal Assessment (25 Marks)</b>		
		1) Punctuality (5)		
		2) Sincerity (5)		
		3) Initiative (5)		
		4) Commitment (5)		
		5) Attitude (5)		
02	External assessment (75 Marks)	<b>B) Skills (75 marks)</b>		
		1) Communication (5)		
		2) Documentation (5)		
		3) Reporting (10)		
		4) Sector Skills (20)		
		5) Plan and Goal of Internship (10)		
03	Joint Assessment for Internship/OJT (75 Marks )	Report of Internship (40)		
		Viva Voce (35 Marks)		
04	Joint Assessment On Project/Case Study/Research/Survey etc. - 75 Marks Coordinator/ Supervisor and External Examiner	Project Work (20 Marks)		
		Project Report (20 Marks) Viva Voce and Presentation (25 + 10 Marks)		
		Total Marks		