Enterprise Application Development using SAP ABAP on HANA

Course Code	KS28001
Course Title	Enterprise Application Development using SAP ABAP on HANA
Number of Credits	0-0-2-1
Course Type	Vocational Elective

Course Objectives:

The course objectives for Enterprise Application Development using SAP ABAP(Advanced Business Application Programming) on HANA typically aim to equip participants with the skills and knowledge necessary to develop and maintain SAP applications using the ABAP programming language.

Course Outcomes:

- ✓ **CO1:** Understand the fundamental concepts of Enterprise Resource Planning (ERP) and SAP.
- ✓ **CO2:** Establish a strong foundation in ABAP programming.
- ✓ **CO3:** Develop skills in managing data structures using the ABAP Data Dictionary.
- ✓ **CO4:** Introduce Object-Oriented ABAP concepts.
- ✓ **CO5:** Master the creation of various types of ABAP reports.

Course Contents:

Unit I: Introduction to ERP, SAP and ABAP
- Introduction to ERP
- Overviews of SAP & it's system architecture
- Overviews of SAP HANA
- Introduction to ABAP programming language
- Introduction to SAP GUI and navigation.

Unit II: ABAP Basics
- ABAP Data Types
- Variables and Constants
- Arithmetic Operations
- Control Structures (IF, CASE, LOOP)
- Internal Tables and Data Structures
- Modularization Techniques (Subroutines, Function Modules)

Unit III: ABAP Data Dictionary
- Tables, Views, and Data Elements
- Domains and Search Helps
- Table Maintenance Generator (TMG)
- Table Indexes and Foreign Keys
- Lock Objects and Data Class

Unit IV: ABAP Object-Oriented Programming (OOP)
- Introduction to Object-Oriented ABAP
- Classes, Objects, and Interfaces

- Inheritance and Polymorphism
- Events and Methods

Unit V: ABAP Reports
- Classical Reports
- Interactive Reports
- ALV (ABAP List Viewer)

Text Books:

1. "SAP ABAP Programming for Beginners" by Sushil Markandeya.
2. "SAP ABAP: A Step-by-Step Guide" by Rabi Jay.

Cloud-IMS (Infrastructure Management Services)

Course Code	KS28002
Course Title	Cloud-IMS (Infrastructure Management Services)
Number of Credits	0-0-2-1
Course Type	Vocational Elective

Course Objectives:

A Cloud-IMS course typically aims to provide students with a comprehensive understanding of managing and utilizing information within cloud computing environments. The primary objectives of such a course may include: - Understanding Cloud Computing, Information Management in the Cloud, Cloud Infrastructure and Services, Security and Compliance, Scalability and Performance, Emerging Technologies and Practical Implementation.

Course Outcomes:

- ✓ Explain the core concepts of the cloud computing paradigm: how and why this paradigm shift came about, the characteristics, advantages and challenges brought about by the various models and services in cloud computing.
- ✓ Apply the fundamental concepts in datacentres to understand the trade-offs in power, efficiency and cost.
- ✓ Identify resource management fundamentals, i.e. resource abstraction, sharing and sandboxing and outline their role in managing infrastructure in cloud computing.
- ✓ Analyse various cloud programming models and apply them to solve problems on the cloud.

Course Contents:

S. No	Topic	Session	Hours
1.	Introduction to Cloud - Cloud fundamentals & Virtualization - Cloud Computing Service Models - Cloud Computing Deployment Models - Service Comparison: AWS, Azure, GCP	1	2
2.	Introduction to OpenStack - Computes - Flavors - Storage - hypervisor - Instances - zones - affinity - Image concepts	2	2
3.	Cloud Networking and SDN vLANs vs vxLANs	3	2
4.	Cloud Economics and Billing	4	2

5.	Cloud Lifecycle management, Instantiation, termination, Cloud Scale In, Scale out, Healing	5	2
6.	Public, Private, Hybrid cloud	6	2
7.	Cloud Orchestration	7	2
8.	Introduction to dockers, Kubernetes, containers, caas , micro-services	8	2
9.	**Hands-On Practice on:** • AWS Edge Location • Different Amazon Web Services • Ways to access AWS: CLI, Console, and SDKs	9	2
10	**Hands-On Practice on:** - Build your VPC and Launch a Web Server	10	2
11	**Hands-On Practice on: -** Working with EBS	11	2
12	**Hands-On Practice on: -** Build a Cloud Database Server, Scale & Load Balance your Architecture	12	2

Text Books:

1. Cloud Computing A practical approach for learning and implementation by A. Srinivasan and J.Suresh
2. Cloud Computing by Sailendra Singh
3. AWS Certified Cloud Practitioner Study Guide by Sybex.

Course Code	KS28003
Course Title	Data Analytics
Number of Credits	0-0-2-1
Course Type	Vocational Elective

Course Objectives:
- ✓ Equip students with fundamental data analysis concepts and Python programming skills.
- ✓ Enable hands-on practice in data cleaning, exploration, analysis, and visualization.
- ✓ Introduce basic machine learning principles

Course Outcomes:

- ✓ Participants will gain a solid foundation in basic Python programming, including variables, data types, operators, functions, and data structures.

- ✓ They will be equipped with hands-on data analysis skills like data cleaning, manipulation, and exploration using Pandas libraries like DataFrames and Series.

- ✓ They will have an introduction to basic statistical concepts like probability, central tendency, and hypothesis testing, providing a framework for data interpretation.

- ✓ Through the mini-project, participants will gain practical experience applying data analysis and Python skills to solve real-world engineering problems.

- ✓ They will be exposed to basic machine learning concepts like supervised and unsupervised learning, K-Nearest Neighbors, and decision trees, understanding their potential applications in engineering.

Course Contents:

Session 1: Introduction to Data Analytics and Python

- Data analytics in engineering: Definition and importance.
- Data types and sources.
- Python for data analysis: Overview and setup.

Session 2: Python Basics for Data

- Variables, data types, operators, and control flow.
- Functions and modules for code organization.

- Introduction to lists and handling data structures.

Session 3 & 4: Data Cleaning and Manipulation with Pandas

- Introduction to Pandas: Data Frames and Series.
- Handling missing values, outliers, and inconsistencies.
- Data wrangling: Merging, transforming, selecting, filtering.

Session 5 & 6: Exploratory Data Analysis (EDA) with Visualization

- Descriptive statistics with Pandas: Summary measures and distributions.
- Creating visualizations with Matplotlib: Histograms, boxplots, scatterplots, bar charts, and line plots.
- Identifying patterns and trends through EDA.

Session 7: Probability and Statistics Fundamentals

- Basic probability concepts: Random variables, distributions, and central tendency.
- Introduction to hypothesis testing and statistical inference.

Session 8: Regression Analysis

- Linear regression model: Assumptions and interpretation.
- Fitting and evaluating linear regression models using Scikit-learn.

Session 9: Data Visualization for Impact

- Effective visualization principles: Choosing the right charts and graphs.
- Creating compelling visualizations using Tableau or Power BI (optional).

Session 10: Introduction to Machine Learning

- Supervised and unsupervised learning paradigms.
- Simple machine learning algorithms: K-Nearest Neighbors (KNN) and decision trees.
- Applications in engineering domains.

Session 11 & 12: Mini-Project

- Hands-on practice applying data analysis techniques and Python to solve engineering problems.

- Students work on individual or group projects with presentations.

Software Tools:

- ✓ Python (Pandas, NumPy, Scikit-learn)
- ✓ Data visualization tools (Tableau, Power BI)

Additional Resources:

- ✓ Online tutorials and courses on data analysis.
- ✓ Open-source datasets for practicing data analysis skills.

Text Book:
1. . Think Stats 2nd Edition by Allen B. Downey
2. Python for Data Analysis by Wes McKinney