

## Semester 5 (3<sup>rd</sup> year 1<sup>st</sup> Semester)

---

Course Code	Course Title	Credit	Theory	Lab
SE 3101	Professional Ethics for Information Systems	3	3	0

**Course Outline:** Introduction to Ethics, Morals, Integrity, Ethical use of Information Technology, Ethics for IT Workers and IT Users - Trade secret, Whistle blowing, fraud, misrepresentation, bribery, professional code of ethics, IT professional malpractice and Common Ethical issues for IT users, Computer and Internet Crime - Exploit, Viruses, Phishing and Types of perpetrators, Privacy - Information privacy, fair information practices, EU data protection directive, key privacy and anonymity issues, Freedom of Expression - Right to freedom of expression, obscene speech, hate speech, defamation, controlling access to information on the internet, anonymity on the internet, corporate blogging and pornography, Intellectual property - Copyright, fair use doctrine, patent, software patents, trade secret and key intellectual property issues, Impact of IT on society, Social networking ethical issues, Ethics for IT organization.

### References:

1. Ethics In Information Technology, George W. Reynolds

Course Code	Course Title	Credit	Theory	Lab
CSE 3103	Web Technology	1	1	0

**Course Outline:** Introduction To Html, Java Script & CSS, Server Side Programming: HTTP Server, Application Server, MVC Web Framework, Web Services, Database Access: Object Relational Mapping, Lambda Expression, Language Integrated Query, Data Reader, Writer, Web Security: Denial of Service, Buffer Overflow, Cross Site Scripting, Authentication and Access Control

### References:

1. Deitel & Deitel, Goldberg, "Internet and world wide web – How to Program", Pearson Education Asia, 2001.
2. Rajkamal, "Web Technology", Tata McGraw-Hill, 2001.
3. Teach yourself web technologies part I & II- I. Bayross. BPB
4. Web Design in a Nutshell- J. Niederst, SPD

Course Code	Course Title	Credit	Theory	Lab
CSE 3104	Web Technology Lab	2	0	2

**Course Outline:** Introduction To Html, Java Script & CSS, Server Side Programming: HTTP Server, Application Server, MVC Web Framework, Web Services, Database Access: Object Relational Mapping, Lambda Expression, Language Integrated Query, Data Reader, Writer, Web Security: Denial of Service, Buffer Overflow, Cross Site Scripting, Authentication and Access Control

#### References:

1. Deitel & Deitel, Goldberg, “Internet and world wide web – How to Program”, Pearson Education Asia, 2001.
2. Rajkamal, “Web Technology”, Tata McGraw-Hill, 2001.
3. Teach yourself web technologies part I & II- I. Bayross. BPB
4. Web Design in a Nutshell- J. Niederst, SPD

Course Code	Course Title	Credit	Theory	Lab
CSE 3105	Data Science and Analytics – DBMS II	1	1	0

**Course Outline:** Indexing and Hashing: Basic Concepts, Ordered Indices, B+-Tree Index Files, B-Tree Index Files, Static Hashing, Dynamic Hashing, Comparison of Ordered Indexing and Hashing; Query Processing: Overview, Measures of Query Cost, Selection Operation, Sorting, Join Operation, Evaluation of Expressions; Query Optimization: Introduction, Transformation of Relational Expressions, Catalog Information for Cost Estimation, Statistical Information for Cost Estimation, Cost-based optimization; Transactions: Transaction Concept, Transaction State, Concurrent Executions, Serializability; Concurrency Control: Lock-Based Protocols, Timestamp-Based Protocols; Recovery System: Failure Classification, Storage Structure, Recovery and Atomicity, Log-Based Recovery, Recovery With Concurrent Transactions; Data Analysis and Mining: Data Mining, Decision tree, Bayes theory, Randomize tree; Database System Architectures: Centralized and Client-Server Systems, Server System Architectures, Parallel Systems, Distributed Systems, Network Types; Parallel Databases: Introduction, I/O Parallelism, Interquery Parallelism, Intraquery Parallelism, Intraoperation Parallelism, Interoperation Parallelism; Distributed Databases: Heterogeneous and Homogeneous Databases: Distributed Data Storage, Distributed Transactions, Commit Protocols; Additional should be

included: Database Design, Database Tuning Security and Authorization, Multidimensional query.

### References:

1. Ramez Elmasri and Shamkant B. Navathe Fundamentals of Database Systems. Third Edition. Addison-Wesley Pub Co, 1999.
2. Database Systems: The Complete Book, Hector Garcia-Molina, Jeffrey D. Ullman and Jennifer D. Widom Prentice Hall. (best supporting book)
3. Fundamentals of Database Systems, by Ramez Elmasri and Shamkant Navathe, Addison Wesley.
4. Database System Concepts, Fifth Edition, Avi Silberschatz, Henry F. Korth, S. Sudarshan (text book)

Course Code	Course Title	Credit	Theory	Lab
CSE 3106	Data Science and Analytics – DBMS II Lab	2	0	2

**Course Outline:** Indexing and Hashing: Basic Concepts, Ordered Indices, B+-Tree Index Files, B-Tree Index Files, Static Hashing, Dynamic Hashing, Comparison of Ordered Indexing and Hashing; Query Processing: Overview, Measures of Query Cost, Selection Operation, Sorting, Join Operation, Evaluation of Expressions; Query Optimization: Introduction, Transformation of Relational Expressions, Catalog Information for Cost Estimation, Statistical Information for Cost Estimation, Cost-based optimization; Transactions: Transaction Concept, Transaction State, Concurrent Executions, Serializability; Concurrency Control: Lock-Based Protocols, Timestamp-Based Protocols; Recovery System: Failure Classification, Storage Structure, Recovery and Atomicity, Log-Based Recovery, Recovery With Concurrent Transactions; Data Analysis and Mining: Data Mining, Decision tree, Bayes theory, Randomize tree; Database System Architectures: Centralized and Client-Server Systems, Server System Architectures, Parallel Systems, Distributed Systems, Network Types; Parallel Databases: Introduction, I/O Parallelism, Interquery Parallelism, Intraquery Parallelism, Intraoperation Parallelism, Interoperation Parallelism; Distributed Databases: Heterogeneous and Homogeneous Databases: Distributed Data Storage, Distributed Transactions, Commit Protocols; Additional should be included: Database Design, Database Tuning Security and Authorization, Multidimensional query.

### References:

1. Ramez Elmasri and Shamkant B. Navathe Fundamentals of Database Systems. Third Edition. Addison-Wesley Pub Co, 1999.
2. Database Systems: The Complete Book, Hector Garcia-Molina, Jeffrey D. Ullman and Jennifer D. Widom Prentice Hall. (best supporting book)

3. Fundamentals of Database Systems, by Ramez Elmasri and Shamkant Navathe, Addison Wesley.
4. Database System Concepts, Fifth Edition, Avi Silberschatz, Henry F. Korth, S. Sudarshan (text book)

Course Code	Course Title	Credit	Theory	Lab
BUS 3107	Business Communications	2	2	0

**Course Outline: Communication Concept:** The Role of Communication in Business, Importance of Communication Skills, Main Form of Business Communication, Process of Human Communication. **Fundamentals of Business Writing:** Adaptation and the Selection of Words, Construction of Clear Sentences and Paragraphs, Writing for Effect. **Basic Pattern of Business Messages:** Directness in Good News and Neutral Situations, Indirectness in Bad Message, Indirectness in Persuasion Message, Letter and Memorandum, Letter Writing Styles, Pattern Variations in Memorandums and the Email, Job Search Activities: Strategies in the Job Search Process, Job search activities, Writing CV, Facing Interviews, Feedback letters for goodwill, **Fundamentals of Report Writing:** Basics of Report Writing, Report Structure: The Short Forms, Long and Formal Report, Usages of Graphics. **Other Form of Business Communication:** Informal Oral Communication, Technology-Enabled Communication.

#### References:

1. Raymond V. Lesikar, John D. Pettit, Maire E. Flatley, Lesikar's Basic Business Communication, Mc Graw Hill.

Course Code	Course Title	Credit	Theory	Lab
BUS 3108	Business Communications Lab	1	0	1

**Course Outline: Communication Concept:** The Role of Communication in Business, Importance of Communication Skills, Main Form of Business Communication, Process of Human Communication. **Fundamentals of Business Writing:** Adaptation and the Selection of Words, Construction of Clear Sentences and Paragraphs, Writing for Effect. **Basic Pattern of Business Messages:** Directness in Good News and Neutral Situations, Indirectness in Bad Message, Indirectness in Persuasion Message, Letter and Memorandum, Letter Writing Styles, Pattern Variations in Memorandums and the Email, Job Search Activities: Strategies in the Job Search Process, Job search activities, Writing CV, Facing Interviews, Feedback letters for

goodwill, **Fundamentals of Report Writing:** Basics of Report Writing, Report Structure: The Short Forms, Long and Formal Report, Usages of Graphics. **Other Form of Business Communication:** Informal Oral Communication, Technology-Enabled Communication.

#### References:

1. Raymond V. Lesikar, John D. Pettit, Maire E. Flatley, Lesikar's Basic Business Communication, Mc Graw Hill.

Course Code	Course Title	Credit	Theory	Lab
SE 3109	Design Pattern	2	2	0

**Course Outline:** Revision of Concepts of OOP, Importance of learning design patterns, Types of Design Patterns - Structural, Behavioral and Creational Patterns, Creational Patterns – Singleton, Factory, Factory Method, Abstract Factory, Builder, Prototype and Object Pool, Behavioral Patterns - Chain of Responsibility, Command, Interpreter, Iterator, Mediator, Memento, Observer, Strategy, Template Method, Visitor and Null Object, Structural Patterns – Adapter, Bridge, Composite, Decorator, Flyweight and Proxy, REFACTORING CODE SMELL, Different type of code smells - Inappropriate Naming, Comments, Dead Code, Duplicated code, Primitive Obsession, Large Class, Lazy Class, Alternative Class with Different Interface, Long Method, Long Parameter List, Switch Statements, Speculative Generality, Oddball Solution, Feature Envy, Refused Bequest, Black Sheep and Train Wreck, Design Principles (SOLID) - Single responsibility principle, Open Close Principle, Liskov substitution principle, Interface segregation principle, Dependency Inversion principle.

#### References:

1. Gamma, Erich. *Design patterns: elements of reusable object-oriented software*. Pearson Education, 1995.

Course Code	Course Title	Credit	Theory	Lab
SE 3110	Design Pattern Lab	1	0	1

**Course Outline:** Revision of Concepts of OOP, Importance of learning design patterns, Types of Design Patterns - Structural, Behavioral and Creational Patterns, Creational Patterns – Singleton, Factory, Factory Method, Abstract Factory, Builder, Prototype and Object Pool, Behavioral Patterns - Chain of Responsibility, Command, Interpreter, Iterator, Mediator, Memento, Observer, Strategy, Template Method, Visitor and Null Object, Structural Patterns – Adapter, Bridge, Composite, Decorator, Flyweight and Proxy, REFACTORING CODE SMELL, Different type of code smells - Inappropriate Naming, Comments, Dead Code, Duplicated code,

Primitive Obsession, Large Class, Lazy Class, Alternative Class with Different Interface, Long Method, Long Parameter List, Switch Statements, Speculative Generality, Oddball Solution, Feature Envy, Refused Bequest, Black Sheep and Train Wreck, Design Principles (SOLID) - Single responsibility principle, Open Close Principle, Liskov substitution principle, Interface segregation principle, Dependency Inversion principle.

**References:**

1. Gamma, Erich. *Design patterns: elements of reusable object-oriented software*. Pearson Education, 1995.

Course Code	Course Title	Credit	Theory	Lab
SE 3112	Software Project Lab II	3	0	3

**Course Outline:** Students will create project teams of 3 members each. Number of team members can be varied for special cases, decided by the assigned course manager. All the project teams are required to prepare their Software Requirements Specification (SRS) first, and later develop the project accordingly.