SRISIVANICOLLEGEOFENGINEERING

(UndertheManagementofSriSivaniEducationalSociety,Srikakulam)
(Approved by AICTE,NewDelhiand Affiliated to JNTUGV, Vizianagaram-CC-W6,
UGCRecognitionunder2(f)&12(B),ISO9001:2015Certified)
NH-16,ChilakapalemJn.,SrikakulamDist.AndhraPradesh-532410

DEPARTMENTOFCIVILENGINEERING
COURSE OUTCOMES

Year/Sem:II–I   **Regulation:R20**   **AcademicYear:2023-24**

Name of the Course: Mathematics-III   **Course Code:**R2021011

Course Outcomes:

After At the end of the course, the student will be able to:

CO201.01:. Interpret the physical meaning of different operators such as gradient, curl and divergence (L5)

CO201.02: Estimate the work done against a field, circulation and flux using vector calculus (L5)

CO201.03: Apply the Laplace transform for solving differential equations (L3)

CO201.04: Find or compute the Fourier series of periodic signals (L3)

CO201.05: Know and be able to apply integral expressions for the forwards and inverse Fourier transform to a range of non-periodic waveforms (L3)

CO201.06: Identify solution methods for partial differential equations that model physical processes

Name of the Course: Object oriented Programming Through C++   **Course Code:**

Course Outcomes: By the end of the course, the student

C202.01: Classify object oriented programming and procedural programming

C202.02: Apply C++ features such as composition of objects, operator overloads, dynamic memory allocation, inheritance and polymorphism, file I/O, exception handling

C202.03: Build C++ classes using appropriate encapsulation and design principles

C202.04: Apply object oriented or non-object oriented techniques to solve bigger computing problems

Nameof the Course: Operating System   **Course Code: R1641024**

CourseOutcomes:

After the completion of the course the student should be able to:

CO203.01: Students will be able to understand various generations of Operating System and functions of Operating System.

CO203.02: Student will understand the concept of program, process and thread and analyze various CPU Scheduling Algorithms and compare their performance.

CO203.03: Student can Compare various Memory Management Schemes especially paging and Segmentation in Operating System.

CO203.04: Student can understand the concept of various Page Replacement Techniques and Thrashing technique.

CO203.05: Student familiar with the File and file system implementation, management and optimization.

CO203.06: Student can understand working of Firewalling to protect systems and networks, Computer security

Name of the Course: Software Engineering   **Course Code: R2021053**

Course Outcomes: After the completion of the course:

CO204.01: Students will be able to decompose the given project in various phases of life cycle

CO204.02: students will be able to choose appropriate process model depending on the user requirements

CO204.03: Students will be able to perform various life cycle activities, like analysis design, implementation testing and maintenance

CO204.04: Skills to design and implement and execute text cases

CO204.05: Students will be able to know the various process used in all the phases of the product

CO204.06: Students can apply the knowledge, techniques and skills in the development of a software product

Name of the Course: Mathematical Foundations of Computer Science   **Course Code:** R2021054

Course Outcomes:

After the completion of the course, the student should be able to:

CO205.01:. To Identify the concepts of mathematical logic's and solving mathematical problems.

CO205.02: To understand the concepts of sets, relations, and functions.

CO205.03: To perform the operations associated with mathematical modeling and proficiency in using mathematical software.

CO205.04: To identify generating functions and recurrence relations.

CO205.05: To relate practical examples to the appropriate set, functions,

CO205.06: To use Graph theory for solving problems.

Name of the Course: Object oriented Programming Through C++ Lab   **Course Code:**

Course Outcomes: By the end of this lab the student is able to

CO206.01: Apply the various OOPs concepts with the help of programs.

CO206.02: Demonstrate procedural and object oriented paradigm with concepts of streams, classes, functions, data and objects

CO206.03: Understand dynamic memory management techniques using pointers, constructors, destructors, etc

CO206.04: Demonstrate the concept of function overloading, operator overloading, virtual functions and polymorphism, inheritance.

Name of the Course: Operating System Lab   **Course Code:**

Course Outcomes: By the end of this lab the student is able to

CO207.01: To use Unix utilities and perform basic shell control of the utilities

CO207.02: To use the Unix file system and file access control

CO207.03: To use of an operating system to develop software

CO207.04: Students will be able to use Linux environment efficiently

CO207.05: Solve problems using bash for shell scripting

Name of the Course: Software Engineering   **Course Code:**

Course Outcomes: By the end of this lab the student is able to

CO208.01: By the end of this lab the student is able to elicit, analyze and specify software requirements through a productive working relationship with various stakeholders of the project

CO208.02: prepare SRS document, design document, test cases and software configuration management and risk management related document.
CO208.03: develop function oriented and object oriented software design using tools like rational rose.
CO208.04: use modern engineering tools necessary for software project management, estimations, time management and software reuse
CO208.05: generate test cases for software testing

Name of the Course: Skill Oriented Course-1- WEB APPLICATION DEVELOPMENT USING FULL STACK
Frontend Development – Module -I   **Course Code:**
Course Outcomes: By the end of this lab the student is able to
CO209.01: Analyze a web page and identify its elements and attributes.
CO209.02: Demonstrate the important HTML tags for designing static pages and separate design from content using Cascading Style sheet
CO209.03: Implement MVC and responsive design to scale well across PC, tablet and Mobile Phone
CO209.04: Create web pages using HTML and Cascading Style Sheets.

Year/Sem:III–I   Regulation:R20   AcademicYear:2023-24
Name of the Course: Computer Networks   **Course Code:**
Course Outcomes: By the end of the course, the student will be able to
CO301.01: Demonstrate different network models for networking links OSI, TCP/IP, B-ISDN, N-BISDN and get knowledge about various communication techniques, methods and protocol standards.
CO301.02: Discuss different transmission media and different switching networks.
CO301.03: Analyze data link layer services, functions and protocols like HDLC and PPP.
CO301.04: Compare and Classify medium access control protocols like ALOHA, CSMA, CSMA/CD, CSMA/CA, Polling, Token passing, FDMA, TDMA, CDMA protocols
CO301.05: Determine application layer services and client server protocols working with the client server paradigms like WWW, HTTP, FTP, e-mail and SNMP etc.

Name of the Course: Design and Analysis of Algorithms   **Course Code:**
Course Outcomes: After the completion of the course, student will be able to
CO302.01: Analyze the performance of a given algorithm, denote its time complexity using the asymptotic notation for recursive and non-recursive algorithms
CO302.02: List and describe various algorithmic approaches and Solve problems using divide and conquer &greedy Method
CO302.03: Synthesize efficient algorithms dynamic programming approaches to solve in common engineering design situations.
CO302.04: Organize important algorithmic design paradigms and methods of analysis: backtracking, branch and bound algorithmic approaches
CO302.05: Demonstrate NP- Completeness theory ,lower bound theory and String Matching

Name of the Course: Data Warehousing and data Mining   **Course Code: R203103**
Course Outcomes:
After the completion of the course the student should be able to:
CO303.01: Illustrate the importance of Data Warehousing, Data Mining and its functionalities and Design

schema for real time data warehousing applications.

CO303.02: Demonstrate on various Data Preprocessing Techniques viz. data cleaning, data integration, data transformation and data reduction and Process raw data to make it suitable for various data mining algorithms

CO303.03: Choose appropriate classification technique to perform classification, model building and evaluation

CO303.04: Make use of association rule mining techniques viz. Apriori and FP Growth algorithms and analyze on frequent item sets generation.

CO303.05: Identify and apply various clustering algorithm (with open source tools), interpret, evaluate and report the result.

CO303.06: Discover interesting patterns, analyze supervised and unsupervised models and estimate the accuracy of the algorithms.

Name of the Course: Open Elective -1 DLD   **Course Code:**

Course Outcomes:

CO304.01:

CO304.02:

CO304.03:

CO304.04:

CO304.05:

CO304.06:

Name of the Course: Professional Elective-I-Artificial Intelligent   **Course Code: R203104**

Course Outcomes: After the completion of the course the student should be able to:

CO305.01: Classify various AI Applications , Apply the logic for tic-tac-toe game playing , List the AI Languages Outline the current trends in AI .

CO305.02: Demonstrate the state space search and control strategies techniques and Apply informed search and uninformed search techniques to problems, Identify problem reduction techniques, Develop game playing strategies using AI techniques.

CO305.03: Classify predicate and propositional logic techniques , Explain natural deduction system and axiomatic system, Explain semantic tableau system in propositional logic.

CO305.04: Illustrate knowledge representation using semantic networks, extended semantic networks and frames, List phases in building expert systems , Distinguish between expert systems and traditional systems , Develop rule based expert system.

CO305.05: Apply probability approaches like Bayesian belief networks, certainty factor theory, to address AI problems.

CO305.06: Apply fuzzy sets and fuzzy logic operations to address uncertainty in AI. Develop the Knowledge representations in Artificial Intelligence.

Name of the Course: Data Ware Housing and data Mining Lab   **Course Code:**

Course Outcomes: By the end of the course student will be able to

CO306.01: Design a data mart or data warehouse for any organization

CO306.02: Extract knowledge using data mining techniques and enlist various algorithms used in information analysis of Data Mining Techniques

CO306.03: Demonstrate the working of algorithms for data mining tasks such as association rule mining, classification for realistic data

CO306.04: Implement and Analyze on knowledge flow application on data sets and Apply the suitable visualization techniques to output analytical results

Name of the Course: Computer Networks Lab   **Course Code:**
Course Outcomes: By the end of the course student will be able to
CO307.01: Know how reliable data communication is achieved through data link layer.
CO307.02: Suggest appropriate routing algorithm for the network.
CO307.03: Provide internet connection to the system and its installation.
CO307.04: Work on various network management tools

Name of the Course: Skill Oriented Course-III- ANIMATION COURSE: ANIMATION DESIGN (Skill Oriented Course)   **Course Code:**
Course Outcomes: At the end of the Course, Student will be able to:
CO308.01: At the end of the Course, Student will be able to:
CO308.02: learn various tools of digital 2-D animation
CO308.03: understand production pipeline to create 2-D animation
CO308.04: apply the tools to create 2D animation for films and videos
CO308.05: understand different styles and treatment of content in 3D model creation
CO308.06: apply tools to create effective 3D modelling texturing and lighting

Name of the Course: Employability Skills-I   **Course Code:**
Course Outcomes: The end of the course student will be able to
CO309.01: Understand the corporate etiquette.
CO309.02: Make presentations effectively with appropriate body language
CO309.03: Be composed with positive attitude
CO309.04: Understand the core competencies to succeed in professional and personal life

Name of the Course: Summer Internships-2 Months   **Course Code:**
Course Outcomes:
CO3010.01:
CO3010.02:
CO3010.03:
CO3010.04:
CO3010.05:
CO3010.06:

Year/Sem:IV–I   **Regulation:R20**   **AcademicYear:2023-24**
Name of the Course: Professional Elective-III-Cloud Computing   **Course Code:**
Course Outcomes: At the end of the course, student will be able to
CO401.01: Illustrate the key dimensions of the challenge of Cloud Computing
CO401.02: Classify the Levels of Virtualization and mechanism of tools.
CO401.03: Analyze Cloud infrastructure including Google Cloud and Amazon Cloud.
CO401.04: Create Combinatorial Auctions for cloud resource and design scheduling algorithms for computing cloud

CO401.05: Assess control storage systems and cloud security, the risks involved its impact and develop cloud application

Name of the Course: Professional Elective-IV- DEEP LEARNING TECHNIQUES **Course Code:**

Course Outcomes: After the completion of the course, student will be able to

CO4**02.01:** Demonstrate the fundamental concepts learning techniques of Artificial Intelligence, Machine Learning and Deep Learning.

CO402.02: Discuss the Neural Network training, various random models

CO402.03: Explain the Techniques of Keras, TensorFlow, Theano and CNTK

CO402.04: Classify the Concepts of CNN and RNN

CO402.05: Implement Interactive Applications of Deep Learning

Name of the Course: Professional Elective-V- Ethical Hacking   **Course Code:**

Course Outcomes: At the end of the course, student will be able to:

CO403.01: Explain the concepts related to hacking, ports and protocols, pen testing and virtualization

CO403.02: Determine the applicable footprinting techniques and scanning methods

CO403.03: Explain the process of system hacking and Explain the concepts Trojans, backdoors, worms and virus and it's countermeasures

CO403.04: Demonstrate systematic understanding of the concepts of Sniffing and Social Engineering and it's attacks

CO403.05: Determine the applicable methods of cryptography, stegnography and Vulnerability Assessment

Name of the Course: Open Elective-III- API AND MICROSERVICES (Job Oriented Course)   **Course Code:**

Course Outcomes: At the end of this course, the student will be able to

CO404.01: Develop a Spring Data JPA application with Spring Boot

CO404.02: Implement CRUD operations using Spring Data JPA

CO404.03: Implement pagination and sorting mechanism using Spring Data JPA

CO404.04: Implement a custom repository to customize a querying mechanism using Spring Data JPA

CO404.05: Develop RESTful endpoints using Spring REST Processing URI parameters

CO404.06: Handle exceptions and errors in Spring REST endpoints

Name of the Course: Open Elective-IV- SECURE CODING TECHNIQUES (Job Oriented Course)   **Course Code:**

Course Outcomes: At the end of this course, the student will be able to

CO405.01: Differentiate the objectives of information security

CO405.02: Understand the trend, reasons and impact of the recent Cyber attacks

CO405.03: Understand OWASP design principles while designing a web application

CO405.04: Understand Threat modelling

CO405.05: Importance of security in all phases of SDLC

CO405.06: Write secure coding using some of the practices in C/C++/Java and Python programming Language.

Name of the Course: UNIVERSAL HUMAN VALUES 2: UNDERSTANDING HARMONY   **Course Code:**

Course Outcomes: At the end of this course, the student will be able to

CO406.01: Understand This course also discusses their role in their family

CO406.02: Understand It, very briefly, touches issues related to their role in the society and the nature.

CO406.03: Understand which needs to be discussed at length in one more semester forwhich the foundation course named

CO406.04: This exposure is to be augmented by this compulsory full semester foundation course.

CO406.05: Development of commitment and courage to act.

CO406.06: Understanding the needs of Self ('I') and 'Body' - happiness and physical facility

Name of the Course: PYTHON: DEEP LEARNING (Skill Oriented Course)   **Course Code:**

Course Outcomes: At the end of the Course, Student will be able to

CO407.01: Demonstrate the basic concepts fundamental learning techniques and layers.

CO407.02: Discuss the Neural Network training, various random models

CO407.04: Apply various optimization algorithms to comprehend different activation

CO407.05: functions to understand hyper parameter tuning

CO407.06: recurrent neural network, and understand its usage to comprehend auto encoders to briefly explain transfer learning

Name of the Course: Minor Course -SOFTWARE ENGINEERING   **Course Code:**

Course Outcomes: At the end of the Course, Student will be able to

CO408.01: Ability to transform an Object-Oriented Design into high quality, executable code

.**CO408.02:** Skills to design, implement, and execute test cases at the Unit and Integration level

CO408.04: Compare conventional and agile software methods

CO408.05: Generate test cases for software testing

CO408.06: Develop function oriented and object oriented software design using tools like rational rose.

Year/Sem:II–II   Regulation:R20   AcademicYear:2023-24

Name of the Course: PROBABILITY AND STATISTICS   **Course Code:**

Course Outcomes: Upon successful completion of this course, the student should be able to

CO201.01: Classify the concepts of data science and its importance (L4) or (L2)

CO201.02: Interpret the association of characteristics and through correlation and regression tools (L4)

CO201.03: Make use of the concepts of probability and their applications (L3)

CO201.04: Apply discrete and continuous probability distributions (L3)

CO201.05: Design the components of a classical hypothesis test (L6)

CO201.06: Infer the statistical inferential methods based on small and large sampling tests (L4)

Name of the Course: DATABASE MANAGEMENT SYSTEMS   **Course Code:**

Course Outcomes: By the end of the course, the student will be able to

CO202.01: Describe a relational database and object-oriented database

CO202.02: Create, maintain and manipulate a relational database using SQL

CO202.03: Describe ER model and normalization for database design

CO202.04: Examine issues in data storage and query processing and can formulate appropriate solutions

CO202.05: Outline the role and issues in management of data such as efficiency, privacy, security, ethical responsibility, and strategic advantage

Name of the Course: FORMAL LANGUAGES AND AUTOMATA THEORY   **Course Code:**

Course Outcomes: By the end of the course students can

CO203.01: Classify machines by their power to recognize languages**.**

CO203.02: Summarize language classes & grammars relationship among them with the help of Chomsky hierarchy

CO203.03: Employ finite state machines to solve problems in computing

CO203.04: Illustrate deterministic and non-deterministic machines

CO203.05: Quote the hierarchy of problems arising in the computer science

Name of the Course: JAVA PROGRAMMING   **Course Code:**

Course Outcomes: By the end of the course, the student will be:

CO204.01: Able to realize the concept of Object Oriented Programming & Java Programming Constructs

CO204.02: Able to describe the basic concepts of Java such as operators, classes, objects, inheritance, packages, Enumeration and various keywords.

CO204.03: Apply the concept of exception handling and Input/ Output operations

CO204.04: Able to design the applications of Java & Java applet

CO204.05: Able to Analyze & Design the concept of Event Handling and Abstract Window Toolkit

Name of the Course: MANAGERIAL ECONOMICS AND FINANCIAL ACCOUNTANCY   **Course Code:**

Course Outcomes: The Learner is equipped with the knowledge of estimating the Demand and demand elasticities for a product

CO205.01: The knowledge of understanding of the Input-Output-Cost relationships and estimation of the least cost combination of inputs

CO205.02: The pupil is also ready to understand the nature of different markets and Price Output determination under various market conditions and also to have the knowledge of different Business Units

CO205.03: The Learner is able to prepare Financial Statements and the usage of various Accounting tools for Analysis

CO205.04: The Learner can able to evaluate various investment project proposals with the help of capital budgeting techniques for decision making

Name of the Course: DATABASE MANAGEMENT SYSTEMS LAB   **Course Code:**

Course Outcomes: At the end of the course the student will be able to:

CO206.01: Utilize SQL to execute queries for creating database and performing data manipulation operations

CO206.02: Examine integrity constraints to build efficient databases

CO206.03: Apply Queries using Advanced Concepts of SQL

CO206.04: Build PL/SQL programs including stored procedures, functions, cursors and triggers

Name of the Course: R PROGRAMMING LAB   **Course Code:**

Course Outcomes: At the end of this course, students will be able to:

CO207.01: Access online resources for R and import new function packages into the R workspace

CO207.02: Import, review, manipulate and summarize data-sets in R

CO207.03: Explore data-sets to create testable hypotheses and identify appropriate statistical tests
CO207.04: Perform appropriate statistical tests using R
CO207.05: Create and edit visualizations with R

Name of the Course: JAVA PROGRAMMING LAB   **Course Code:**

Course Outcomes: By the end of the course student will be able to write java program for

CO208.01: Evaluate default value of all primitive data type, Operations, Expressions, Controlflow, Strings

CO208.02: Determine Class, Objects, Methods, Inheritance, Exception, Runtime Polymorphism, User defined Exception handling mechanism

CO208.03: Illustrating simple inheritance, multi-level inheritance, Exception handling mechanism

CO208.04: Construct Threads, Event Handling, implement packages, developing applets

Name of the Course: Skill Oriented Course- II- APPLICATIONS OF PYTHON-Pandas   **Course Code:**

Course Outcomes: By the end of this lab the student is able to

CO209.01: Use Pandas to create and manipulate data structures like Series and Data Frames.

CO209.02: Work with arrays, queries, and data frames

CO209.03: Query Data Frame structures for cleaning and processing and manipulating files

CO209.04: Understand best practices for creating basic charts

Year/Sem:III–II   **Regulation:R20**   **AcademicYear:2023-24**

Name of the Course: MACHINE LEARNING   **Course Code:**

Course Outcomes: After the completion of the course, student will be able to

CO301.01: Explain the fundamental usage of the concept Machine Learning system

CO301.02: Demonstrate on various regression Technique

CO301.03: Analyze the Ensemble Learning Methods

CO301.04: Illustrate the Clustering Techniques and Dimensionality Reduction Models in Machine Learning.

CO301.05: Discuss the Neural Network Models and Fundamentals concepts of Deep Learning

Name of the Course: COMPILER DESIGN   **Course Code:**

Course Outcomes: At the end of the course, student will be able to

CO302.01: Demonstrate phases in the design of compiler

CO302.02: Organize Syntax Analysis, Top Down and LL(1) grammars

CO302.03: Design Bottom Up Parsing and Construction of LR parsers

CO302.04: Analyze synthesized, inherited attributes and syntax directed translation schemes

CO302.05: Determine algorithms to generate code for a target machine

Name of the Course: CRYPTOGRAPHY AND NETWORK SECURITY   **Course Code:**

Course Outcomes: At the end of the course, student will be able to

CO303.01: Explain different security threats and countermeasures and foundation course of cryptography mathematics.

CO303.02: Classify the basic principles of symmetric key algorithms and operations of some symmetric key algorithms and asymmetric key cryptography

CO303.03: Revise the basic principles of Public key algorithms and Working operations of some Asymmetric key algorithms such as RSA, ECC and some more

CO303.04: Design applications of hash algorithms, digital signatures and key management techniques

CO303.05: Determine the knowledge of Application layer, Transport layer and Network layer security Protocols such as PGP, S/MIME, SSL,TSL, and IPsec .

Name of the Course: OBJECT ORIENTED ANALYSIS AND DESIGN (Professional Elective II) **Course Code:**

Course Outcomes: After finishing this course student will be able to:

CO304.01: Analyze the nature of complex system and its solutions**.**

CO304.02: Illustrate & relate the conceptual model of the UML, identify & design the classes and relationships

CO304.03: Analyze &Design Class and Object Diagrams that represent Static Aspects of a Software System and apply basic and Advanced Structural Modeling Concepts for designing real time applications.

CO304.04: Analyze & Design behavioral aspects of a Software System using Use Case, Interaction and Activity Diagrams.

CO304.05: Analyze & Apply techniques of State Chart Diagrams and Implementation Diagrams to model behavioral aspects and Runtime environment of Software Systems.

Name of the Course: MACHINE LEARNING USING PYTHON LAB **Course Code:**

Course Outcomes: At the end of the course, student will be able to

CO305.01: Implement procedures for the machine learning algorithms

CO305.02: Design and Develop Python programs for various Learning algorithms

CO305.03: Apply appropriate data sets to the Machine Learning algorithms

CO305.04: Develop Machine Learning algorithms to solve real world problems

Name of the Course: COMPILER DESIGN LAB **Course Code:**

Course Outcomes: The end of the course student will be able to

CO307.01: Design simple lexical analyzers

CO307.02: Determine predictive parsing table for a CFG

CO307.03: Apply Lex and Yacc tools

CO307.04: Examine LR parser and generating SLR Parsing table

CO307.05: Relate Intermediate code generation for subset C language

Name of the Course: CRYPTOGRAPHY NETWORK SECURITY LAB **Course Code:**

Course Outcomes: At the end of the course, student will be able to

CO308.01: Apply the knowledge of symmetric cryptography to implement encryption and decryption using Ceaser Cipher, Substitution Cipher, Hill Cipher

CO308.02: Demonstrate the different algorithms like DES, BlowFish, and Rijndael, encrypt the text "Hello world" using Blowfish Algorithm

CO308.03: Analyze and implement public key algorithms like RSA, Diffie-Hellman Key Exchange mechanism, the message digest of a text using the SHA-1 algorithm

Name of the Course: MEAN STACK TECHNOLOGIES-MODULE I (HTML 5, JAVASCRIPT, EXPRESS.JS, NODE.JS AND TYPESCRIPT) (Skill Oriented Course)   **Course Code:**

Course Outcomes: At the end of the Course, Student will be able to:

CO309.01: Develop professional web pages of an application using HTML elements like lists, navigations, tables, various form elements, embedded media which includes images, audio, video and CSS Styles.

CO309.02: Utilize JavaScript for developing interactive HTML web pages and validate form data.

CO309.03: Build a basic web server using Node.js and also working with Node Package Manager (NPM).

CO309.04: Build a web server using Express.js

CO309.05: Make use of Typescript to optimize JavaScript code by using the concept of strict type checking.

Name of the Course: EMPLOYABILITY SKILLS-II   **Course Code:**

Course Outcomes: After completion of this course

CO3010.01: Solve various Basic Mathematics problems by following different methods

CO3010.02: Follow strategies in minimizing time consumption in problem solving Apply shortcut methods to solve problems

CO3010.03: Confidently solve any mathematical problems and utilize these mathematical skills both in their professional as well as personal life.

CO3010.04: Analyze, summarize and present information in quantitative forms including table, graphs and formulas

Year/Sem:III–II   **Regulation:R20**   **AcademicYear:2023-24**

Name of the Course: **Course Code:**

Course Outcomes: After completion of this course

CO3010.01:

CO3010.02:

CO3010.03:

CO3010.04: