**ESWAR COLLEGE OF ENGINEERING: NARASARAOPET**
Approved by AICTE, New Delhi., Affiliated to JNTUK, Kakinada
Kesanupalli Village, Narasaraopet – 522 601,
Palnadu Dist. A.P.

# Department Of Computer Science and Engineering

## Course Outcomes

**Year/Sem: II B.Tech I Sem** **A.Y: 2021-22**

| **Course Name: Mathematics III** | |
|---|---|
| **Course Code: CSE2101** | |
| **CSE2101.1** | State and prove vector Line , Surface and volume integral Theorems. State and prove Stokes and Green's theorems. |
| **CSE2101.2** | Derive Laplace transform standard functions. Deduce inverse Laplace transform functions. |
| **CSE2101.3** | Explain about Periodic functions , even and odd functions. Explain about Half range sine and cosine series. Explain Fourier transforms. State and prove Fourier integral theorem and problems. |
| **CSE2101.4** | Explain Fourier Transforms. State and prove Fourier integral theorem and problems. |
| **CSE2101.5** | Explain By eliminating Orbitary constants and Orbitary functions. Derive Legrangies equation and problems. |
| **CSE2101.6** | Derive solutions of linear P.D.E with constant coefficients and problems. Explain method of separation of variables and wave & heat equations. |

| **Course Name: Object Oriented Programming through C++** | |
|---|---|
| **Course Code: CSE2102** | |
| **CSE2102.1** | Classify object oriented programming and procedural programming |
| **CSD2102.2** | Apply C++ features such as composition of objects, operator overloads, dynamic memory allocation |
| **CSD2102.3** | Inheritance and Polymorphism |
| **CSD2102.4** | Build C++ classes using appropriate encapsulation and design principles |
| **CSD2102.5** | Apply object oriented or non-object oriented techniques to solve bigger computing |
| **CSD2102.6** | File I/O, exception handling |

| **Course Name: Operating Systems** | |
|---|---|
| **Course Code: CSE2103** | |
| **CSE2103.1** | Describe various generations of Operating System and functions of Operating System |
| **CSE2103.2** | Describe the concept of program, process and thread and analyze various CPU Scheduling algorithms |
| **CSE2103.3** | Solve Inter Process Communication problems using Mathematical Equations by various methods. |
| **CSE2103.4** | Compare various Memory Management Schemes |
| **CSE2103.5** | especially paging and Segmentation |
| **CSE2103.6** | Outline File Systems in Operating System like UNIX/Linux and Windows |

| **Course Name: Software Engineering** | |
|---|---|
| **Course Code: CSE2104** | |
| **CSE2104.1** | Ability to transform an Object-Oriented Design into high quality, executable code. |
| **CSE2104.2** | Skills to design, implement, and execute test cases at the Unit and Integration level. |
| **CSE2104.3** | Prepare SRS document, design document, test cases and software configuration management and risk management related document. |
| **CSE2104.4** | Develop function oriented and object oriented software design using tools like rational rose. |
| **CSE2104.5** | Use modern engineering tools necessary for software project management, estimations, time management and software reuse. |
| **CSE2104.6** | Generate test cases for software testing. |

| **Course Name: Mathematical Foundations of Computer Science** | |
|---|---|
| **Course Code: CSE2105** | |
| **CSE2105.1** | Demonstrate skills in solving mathematical problems |
| **CSE2105.2** | Comprehend mathematical principles and logic |
| **CSE2105.3** | Demonstrate knowledge of mathematical modelling |
| **CSE2105.4** | Proficiency in using mathematical software |
| **CSE2105.5** | Manipulate and analyze data numerically and/or graphically using appropriate Software |
| **CSE2105.6** | Communicate effectively mathematical ideas/results verbally or in writing |

| Course Name: Object Oriented Programming through C++ Lab | |
|---|---|
| Course Code: CSE2106 | |
| CSE2106.1 | Apply the various OOPs concepts with the help of programs |
| CSE2106.2 | Write a program implementing Friend Function |
| CSE2106.3 | Write a program to Overload Unary, and Binary Operators as Member Function, and Non Member Function |
| CSE2106.4 | Write a C++ program Multiple level Inheritance |
| CSE2106.5 | Write a C++ program Hierarchical Inheritance |
| CSE2106.6 | Write a Program for Exception Handling Divide by zero |

| Course Name: Operating Systems Lab | |
|---|---|
| Course Code: CSE2107 | |
| CSE2107.1 | To use Unix utilities and perform basic shell control of the utilities |
| CSE2107.2 | To use the Unix file system |
| CSE2107.3 | To use the file access control |
| CSE2107.4 | To use of an operating system to develop software |
| CSE2107.5 | Students will be able to use Linux environment efficiently |
| CSE2107.6 | Solve problems using bash for shell scripting |

| **Course Name: Software Engineering Lab** | |
|---|---|
| **Course Code: CSE2108** | |
| **CSE2108.1** | 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. |
| **CSE2108.2** | Prepare SRS document, design document, test cases and software configuration management and risk management related document. |
| **CSE2108.3** | Develop function oriented and object oriented software design using tools like rational rose. |
| **CSE2108.4** | Use modern engineering tools necessary for software project management, estimations, time management and software reuse. |
| **CSE2108.5** | Generate test cases for software testing |
| **CSE2108.6** | Will have experience and/or awareness of testing problems and will be able to develop a simple testing report. |

| **Course Name: APPLICATIONS OF PYTHON-NUMPY LAB** | |
|---|---|
| **Course Code: CSE2109** | |
| **CSE2109.1** | Explain how data is collected ,managed and stored for processing |
| **CSE2109.2** | Understand the working of various numerical techniques, different descriptive measures of Statistics to solve the engineering problems. |
| **CSE2109.3** | Understand how to apply some linear algebra operations to n-dimensional arrays |
| **CSE2109.4** | Use NumPy perform common data wrangling and computational tasks in Python |
| **CSE2109.5** | Understand the correlation and regression to solve the engineering problems |
| **CSE2109.6** | Utilise NumPy arrays to store and perform operations on data sets |

**Year/Sem: II B.Tech II Sem**

| **Course Name: Probability and Statistics** | |
|---|---|
| **Course Code: CSE2201** | |
| **CSE2201.1** | Explain the concepts of data science and its importance |
| **CSE2201.2** | Learn characteristics and through Correlation and regression tools |
| **CSE2201.3** | Write the concepts of probability and their applications |
| **CSE2201.4** | Apply discrete and continuous probability distributions |
| **CSE2201.5** | Explain the components of classical hypothesis test |
| **CSE2201.6** | To learn statistical inferential methods based on small and large sampling test |

| **Course Name: Database Management Systems** | |
|---|---|
| **Course Code: CSE2202** | |
| **CSE2202.1** | Describe a relational database and object-oriented database |
| **CSE2202.2** | Create, maintain and manipulate a relational database using SQL |
| **CSE2202.3** | Describe ER model and normalization for database design |
| **CSE2202.4** | Examine issues in data storage and query processing and can formulate appropriate solutions |
| **CSE2202.5** | Outline the role and issues in management of data such as efficiency, privacy, security. |
| **CSE2202.6** | Outline the role and issues in management of data such as ethical responsibility, and strategic advantage. |

| **Course Name: Formal Languages and Automata Theory** | |
|---|---|
| **Course Code: CSE2203** | |
| **CSE2203.1** | Classify machines by their power to recognize languages. |
| **CSE2203.2** | Summarize language classes & grammars relationship among them with the help of Chomsky hierarchy |
| **CSE2203.3** | Employ finite state machines to solve problems in computing |
| **CSE2203.4** | Illustrate deterministic machines |
| **CSE2203.5** | Illustrate non-deterministic machines |
| **CSE2203.6** | Quote the hierarchy of problems arising in the computer science |

| **Course Name: Java Programming** | |
|---|---|
| **Course Code: CSE2204** | |
| **CSE2204.1** | Able to realize the concept of object oriented programming & java programming constructs. |
| **CSE2204.2** | Able to describe the basic concepts of java such as operators,classes,objects. |
| **CSE2204.3** | Able to described the basic concept of java such as inheritance,packages,enumeration and various keywords. |
| **CSE2204.4** | Apply the concept of exception handling and Input/Output operations. |
| **CSE2204.5** | Able to design the application of java & java applet. |
| **CSE2204.6** | Able to Analyze & Design the concept of Event Handling and Abstract Window ToolKit. |

| Course Name: Managerial Economics and Financial Accountancy | |
|---|---|
| **Course Code: CSE2205** | |
| **CSE2205.1** | The Student is enhanced with the knowledge of estimating the Supply Demand and demand elasticises for a product. |
| **CSE 2205.2** | The knowledge of understanding of the Input-Output-Cost relationships and estimation of the least cost combination of inputs |
| **CSE 2205.3** | The Students 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 regarding Product & Services |
| **CSE2205.4** | They can understand the knowledge of formation of the company and company business cycle. |
| **CSE2205.5** | The Learner is able to prepare accounts, Ledger then Financial Statements and the usage of various Accounting tools for Analysis. |
| **CSE2205.6** | The Learner can able to evaluate various investment project proposals with the help of capital budgeting techniques for business decision making. |

| Course Name: Database Management Systems Lab | |
|---|---|
| **Course Code: CSE2206** | |
| **CSE2206.1** | Utilize SQL to execute queries for creating database and performing data manipulation operations |
| **CSE2206.2** | Examine integrity constraints to build efficient databases |
| **CSE2206.3** | Apply Queries using Advanced Concepts of SQL |
| **CSE2206.4** | Build PL/SQL programs including stored procedures, functions, cursors and triggers |
| **CSE2206.5** | Build PL/SQL programs including functions. |
| **CSE2206.6** | Build PL/SQL programs including cursors and triggers |

| Course Name: R Programming Lab | |
|---|---|
| **Course Code: CSE2207** | |
| **CSE2207.1** | Access online resources for R and import new function packages into the R workspace |
| **CSE2207.2** | Import, review, manipulate and summarize data-sets in R |
| **CSE2207.3** | Explore data-sets to create testable hypotheses |
| **CSE2207.4** | Identify appropriate statistical tests |
| **CSE2207.5** | Perform appropriate statistical tests using R |
| **CSE2207.6** | Create and edit visualizations with R |

| **Course Name: Java Programming Lab** | |
|---|---|
| **Course Code: CSE2208** | |
| **CSE2208.1** | Evaluate default value of all primitive data type, Operations, Expressions, Control-flow, Strings |
| **CSE2208.2** | Determine Class, Objects, Methods, Inheritance. |
| **CSE2208.3** | Exception, Runtime Polymorphism. |
| **CSE2208.4** | User defined Exception handling mechanism. |
| **CSE2208.5** | Illustrating simple inheritance, multi-level inheritance, Exception handling mechanism |
| **CSE2208.6** | Construct Threads, Event Handling, implement packages, developing applets |

| **Course Name: APPLICATIONS OF PYTHON-PANDAS LAB** | |
|---|---|
| **Course Code: CSE2209** | Use Pandas to create and manipulate data structures like Series and Data f rames |
| **CSE2209.1** | Work with arrays ,queries and data frames |
| **CSE2209.2** | Query Data Frame structures for cleaning and processing and manipulating files |
| **CSE2209.3** | Understand best practice for creating basic charts |
| **CSE2209.4** | Describe how to index and "type" Pandas Series and Data frames. |
| **CSE2209.5** | Create histograms and scatter plots for basic exploratory data analysis |
| **CSE2209.6** | Use Pandas to create and manipulate data structures like Series and Data frames |

**Year/Sem: III B.Tech I Sem**

| Course Name: Data Warehousing and Data Mining | |
|---|---|
| Course Code :CSE3101 | |
| CSE3101.1 | Design a Data warehouse system |
| CSE3101.2 | Perform business analysis with OLAP tools |
| CSE3101.3 | Apply suitable pre-processing and visualization techniques for data analysis |
| CSE3101.4 | Apply frequent pattern and association rule mining techniques for data analysis |
| CSE3101.5 | Apply appropriate classification techniques for data analysis |
| CSE3101.6 | Apply appropriate clustering techniques for data analysis |

| **Course Name: Computer Networks** | |
|---|---|
| **Course Code: CSE3102** | |
| **CSE3102.1** | Illustrate the OSI and TCP reference model |
| **CSE3102.2** | Illustrate the OSI and IP reference model |
| **CSE3102.3** | Analyze MAC layer protocols and LAN technologies |
| **CSE3102.4** | Design applications using internet protocols |
| **CSE3102.5** | Implement routing and congestion control algorithms |
| **CSE3102.6** | Develop application layer protocols |

| **Course Name: Compiler Design** | |
|---|---|
| **Course Code: CSE3103** | |
| **CSE3103.1** | Design, develop, and implement a compiler for any language |
| **CSE3103.2** | Use LEX and YACC tools for developing a scanner and a parser |
| **CSE3103.3** | Design and implement LL and LR parsers |
| **CSE3103.4** | Design algorithms to perform code optimization |
| **CSE3103.5** | Design algorithms to perform code optimization in order to improve the performance of a program in terms of space and time complexity |
| **CSE3103.6** | Apply algorithms to generate machine code |

| **Course Name: Artificial Intelligence** | |
|---|---|
| **Course Code: CSE3104** | |
| **CSE3104.1** | Outline problems that are amenable to solution by AI methods |
| **CSE3104.2** | Which AI methods may be suited to solving a given problem |
| **CSE3104.3** | Apply the language/framework of different AI methods for a given problem |
| **CSE3104.4** | Implement basic AI algorithms- standard search algorithms or dynamic programming |
| **CSE3104.5** | Design and carry out an empirical evaluation of different algorithms on problem formalization |
| **CSE3104.6** | State the conclusions that the evaluation supports |

| Course Name:ADVANCED DATA STRUCTURES | |
|---|---|
| **Course Code: CSE3105** | |
| **CSE3105.1** | Illustrate several sub-quadratic sorting algorithms. |
| **CSE3105.2** | Demonstrate recursive methods |
| **CSE3105.3** | Apply advanced data structures such as balanced search trees |
| **CSE3105.4** | Apply advanced data structures such as hash tables |
| **CSE3105.5** | Apply advanced data structures such as priority queues |
| **CSE3105.6** | disjoint set union/find data structure |

| Course Name: Computer Networks Lab | |
|---|---|
| **Course Code: CSE3106** | |
| **CSE3106.1** | Apply the basics of Physical layer in real time applications |
| **CSE3106.2** | Apply data link layer concepts, design issues, and protocols |
| **CSE3106.3** | Apply Network layer routing protocols and IP addressing |
| **CSE3106.4** | Apply Network layer IP addressing |
| **CSE3106.5** | Implement the functions of Application layer |
| **CSE3106.6** | Presentation layer paradigms and Protocols |

| Course Name: AI Tools & Techniques Lab | |
|---|---|
| **Course Code: CSE3107** | |
| **CSE3107.1** | Identify problems that are amenable to solution by AI methods |
| **CSE3107.2** | Identify appropriate AI methods to solve a given problem |
| **CSE3107.3** | Use language/framework of different AI methods for solving problems |
| **CSE3107.4** | Implement basic AI algorithms |
| **CSE3107.5** | Design and carry out an empirical evaluation of different algorithms on problem formalization |
| **CSE3107.6** | State the conclusions that the evaluation supports |

| Course Name: Data Mining Lab | |
|---|---|
| **Course Code: CSE3108** | |
| **CSE3108.1** | Extend the functionality of R by using add-on packages |
| **CSE3108.2** | Examine data from files and other sources and perform various data manipulation tasks on them |
| **CSE3108.3** | Code statistical functions in R |
| **CSE3108.4** | Use R Graphics and Tables to visualize results |
| **CSE3108.5** | various statistical operations on data |
| **CSE3108.6** | Apply the knowledge of R gained to data Analytics for real life applications |

**Year/Sem: III B.Tech II Sem**

| **Course Name: Web Technologies** | |
|---|---|
| **Course Code: CSE3201** | |
| **CSE3201.1** | Illustrate the basic concepts of HTML and CSS & apply those concepts to design static web pages |
| **CSE3201.2** | Identify and understand various concepts related to dynamic web pages and validate them using JavaScript |
| **CSE3201.3** | Outline the concepts of Extensible markup language & AJAX |
| **CSE3201.4** | Develop web Applications using Scripting Languages & Frameworks |
| **CSE3201.5** | Create and deploy secure web applications using PHP and RUBY |
| **CSE3201.6** | Create usable database driven web applications using PHP and RUBY |

| **Course Name: Distributed Systems** | |
|---|---|
| **Course Code: CSE3202** | |
| **CSE3202.1** | Elucidate the foundations and issues of distributed systems |
| **CSE3202.2** | Illustrate the various synchronization issues and global state for distributed systems |
| **CSE3202.3** | Illustrate the Mutual Exclusion and Deadlock detection algorithms in distributed systems |
| **CSE3202.4** | Describe the agreement protocols and fault tolerance mechanisms in distributed systems |
| **CSE3202.5** | Describe the features of peer-to-peer shared memory systems |
| **CSE3202.6** | Describe the features of distributed shared memory systems |

| **Course Name: Design and Analysis of Algorithms** | |
|---|---|
| **Course Code: CSE3203** | |
| **CSE3203.1** | Describe asymptotic notation used for denoting performance of algorithms |
| **CSE3203.2** | Analyze the performance of a given algorithm and denote its time complexity using the asymptotic notation for recursive and non-recursive algorithms |
| **CSE3203.3** | List and describe various algorithmic approaches |
| **CSE3203.4** | Solve problems using divide and conquer, greedy, dynamic programming, backtracking and branch and bound algorithmic approaches |
| **CSE3203.5** | Apply graph search algorithms to real world problems |
| **CSE3203.6** | Demonstrate an understanding of NP- Completeness theory and lower bound theory |

| Course Name: principles of communication | |
|---|---|
| **Course Code: CSE3204** | |
| **CSE3204.1** | Analyze the performance of analog modulation schemes in time and frequency domains. |
| **CSE3204.2** | Analyze the performance of angle modulated signals. |
| **CSE3204.3** | Characterize analog signals in time domain as random processes and noise |
| **CSE3204.4** | Characterize the influence of channel on analog modulated signals |
| **CSE3204.5** | Determine the performance of analog communication systems in terms of SNR |
| **CSE3204.6** | Analyze pulse amplitude modulation, pulse position modulation, pulse code modulation and TDM systems. |

| Course Name: Managerial Economics and Financial Accountancy | |
|---|---|
| **Course Code: CSE3206** | |
| **CSE3206.1** | The Learner is equipped with the knowledge of estimating the Demand and demand elasticities for a product. |
| **CSE3206.2** | The knowledge of understanding of the Input-Output-Cost relationships and estimation of the least cost combination of inputs. |
| **CSE3206.3** | 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. |
| **CSE3206.4** | The Learner is able to prepare Financial Statements and the usage of various Accounting tools for Analysis. |
| **CSE3206.5** | The Learner can able to evaluate various investment project proposals with the help of capital budgeting techniques for decision making. |
| **CSE3206.6** | Capital budgeting techniques for decision making. |

| Course Name: Web Technologies Lab | |
|---|---|
| **Course Code: CSE3207** | |
| **CSE3207.1** | Analyze and apply the role of languages like HTML, CSS, XML |
| **CSE3207.2** | Review JavaScript, PHP and protocols in the workings of the web and web applications |
| **CSE3207.3** | Apply Web Application Terminologies, Internet Tools |
| **CSE3207.4** | E – Commerce and other web services |
| **CSE3207.5** | Develop and Analyze dynamic Web Applications using PHP & MySql |
| **CSE3207.6** | Install & Use Frameworks |

**Year/Sem: IV B.Tech I Sem**

| **Course Name: Cryptography and Network Security** | |
|---|---|
| **Course Code:CSE4101** | |
| **CSE4101.1** | To be familiarity with information security awareness and a clear understanding of its importance. |
| **CSE4101.2** | To master fundamentals of secret and public cryptography |
| **CSE4101.3** | To master protocols for security services |
| **CSE4101.4** | To be familiar with network security threats and countermeasures |
| **CSE4101.5** | To be familiar with network security designs using available secure solutions (such as PGP) |
| **CSE4101.6** | To be familiar with network security designs using available secure solutions(SSL, IPSec, etc) |

| **Course Name: Software Architecture & Design Patterns** | |
|---|---|
| **Course Code: CSE4102** | |
| **CSE4102.1** | To understand interrelationships, principles and guidelines governing architecture and evolution over time. |
| **CSE4102.2** | To understand various architectural styles of software systems. |
| **CSE4102.3** | To understand design patterns. |
| **CSE4102.4** | their underlying object oriented concepts. |
| **CSE4102.5** | To understand implementation of design patterns and providing solutions to real world software design problems. |
| **CSE4102.6** | To understand patterns with each other and understanding the consequences of combining patterns on the overall quality of a system. |

| **Course Name: Web Technologies** | |
|---|---|
| **Course Code: CSE4103** | |
| **CSE4103.1** | Analyze a web page and identify its elements and attributes. |
| **CSE4103.2** | Create web pages using XHTML and Cascading Styles sheets. |
| **CSE4103.3** | Build dynamic web pages. |
| **CSE4103.4** | Build web applications using PHP. |
| **CSE4103.5** | Programming through PERL and Ruby |
| **CSE4103.6** | Write simple client-side scripts using AJAX |

| Course Name: Managerial Economics and Financial Analysis | |
|---|---|
| **Course Code: CSE4104** | |
| **CSE4104.1** | The Learner is equipped with the knowledge of estimating the Demand and demand elasticities for a product. |
| **CSE4104.2** | knowledge of understanding of the Input-Output-Cost relationships and estimation of the least cost combination of inputs. |
| **CSE4104.3** | One is also ready to understand the nature of different markets and Price Output determination |
| **CSE4104.4** | under various market conditions and also to have the knowledge of different Business Units |
| **CSE4104.5** | The Learner is able to prepare Financial Statements and the usage of various Accounting tools for Analysis and to evaluate various investment project proposals |
| **CSE4104.6** | Capital budgeting techniques for decision making. |

| Course Name: Mobile Computing | |
|---|---|
| **Course Code: CSE4105** | |
| **CSE4105.1** | Able to think and develop new mobile application. |
| **CSE4105.2** | Able to take any new technical issue related to this new paradigm. |
| **CSE4105.3** | come up with a solution(s). |
| **CSE4105.4** | Able to develop new ad hoc network applications algorithms/protocols. |
| **CSE4105.5** | Able to develop new ad hoc algorithms/protocols |
| **CSE4105.6** | Able to understand & develop any existing or new protocol related to mobile environment |

| Course Name: Software Project Management | |
|---|---|
| **Course Code: CSE4106** | |
| **CSE4106.1** | To match organizational needs to the most effective software development model |
| **CSE4106.2** | To understand the basic concepts and issues of software project management |
| **CSE4106.3** | To effectively Planning the software projects |
| **CSE4106.4** | To implement the project plans through managing people, communications and change |
| **CSE4106.5** | To select and employ mechanisms for tracking the software projects |
| **CSE4106.6** | To conduct activities necessary to successfully complete and close the Software projects |

| **Course Name: Software Architecture& Design Patterns Lab** | |
|---|---|
| **Course Code: CSE4107** | |
| **CSE4107.1** | Design of the Use Case View. Risk Analysis. |
| **CSE4107.2** | implementation of the software architecture of a Weather Mapping System (WMS). |
| **CSE4107.3** | Implementation will take place in Java. |
| **CSE4107.4** | Implementation will take place C++ |
| **CSE4107.5** | Each lab assignment consists of a theoretical part and a practical part, which are defined in specific lab assignment statements |
| **CSE4107.6** | Using UML design Iterator Design pattern |

| **Course Name: Web Technologies Lab** | |
|---|---|
| **Course Code: CSE4108** | |
| **CSE4108.1** | Students will be able to develop static web sites using XHTML and Java Scripts |
| **CSE4108.2** | To implement XML and XSLT for web applications |
| **CSE4108.3** | Develop Dynamic web content using Java Servlets |
| **CSE4108.4** | Develop Dynamic web content using JSP |
| **CSE4108.5** | To develop JDBC connections. |
| **CSE4108.6** | implement a complete Dynamic web application |

**Year/Sem: IV B.Tech II Sem**

| **Course Name: Distributed Systems** | |
|---|---|
| **Course Code: CS4201** | |
| **CS4201.1** | Develop a familiarity with distributed file systems. |
| **CS4201.2** | Describe important characteristics of distributed systems |
| **CS4201.3** | The salient architectural features of such systems. |
| **CS4201.4** | Describe the features and applications of important standard protocols which are used in distributed systems. |
| **CS4201.5** | Gaining practical experience of inter-process communication in a distributed environment |
| **CS4201.6** | Gaining practical experience of inter-process communication |

| **Course Name: Management Science** | |
|---|---|
| **Course Code: CS4202** | |
| **CSE4202.1** | After completion of the Course the student will acquire the knowledge on management functions, |
| **CSE4202.2** | Global leadership. |
| **CSE4202.3** | After completion of the Course the student will acquire the knowledge on organizational behaviour. |
| **CSE4202.4** | Will familiarize with the concepts of project management. |
| **CSE4202.5** | Will familiarize with the concepts of strategic management. |
| **CSE4202.6** | Will familiarize with the concepts of functional management. |

| **Course Name: Machine Learning** | |
|---|---|
| **Course Code: CS4203** | |
| **CSE4203.1** | Recognize the characteristics of machine learning that make it useful to real-world □Problems. |
| **CSE4203.2** | Characterize machine learning algorithms as supervised, semi-supervised, and Unsupervised. |
| **CSE4203.3** | Have heard of a few machine learning toolboxes. |
| **CSE4203.4** | Be able to use support vector machines. |
| **CSE4203.5** | Be able to use regularized regression algorithms. |
| **CSE4203.6** | Understand the concept behind neural networks for learning non-linear functions. |

| **Course Name: Artificial Neural Networks** | |
|---|---|
| **Course Code: CS4204** | |
| **CSE4204.1** | This course has been designed to offer as a graduate-level/ final year undergraduate level elective subject to the students of any branch of engineering/ science, having basic foundations of matrix algebra, |
| **CSE4204.2** | calculus and preferably (not essential) with a basic knowledge of optimization |
| **CSE4204.3** | Students and researchers desirous of working on pattern recognition and classification, regression and interpolation from sparse observations; |
| **CSE4204.4** | control and optimization are expected to find this course useful. The course covers theories and usage of artificial neural networks (ANN) for problems pertaining to classification (supervised/ unsupervised) and regression. |
| **CSE4204.5** | The course starts with some mathematical foundations and the structures of artificial neurons, which mimics biological neurons in a grossly scaled down version. |
| **CSE4204.6** | The course introduces perceptrons, discusses its capabilities and limitations as a pattern classifier and later develops concepts of multilayer perceptrons with back propagation learning. |