Program Outcomes (PO) of Computer engineering with effect from Academic Year: 2023-2024

PO1- Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2- Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3- Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4-Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5- Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6- The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7- Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8- Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9- Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10- Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11- Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12- Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

COMPUTER ENGINEERING
SEMESTER-1

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF COMPUTER ENGINEERING

COURSE OUTCOME

Program:	Bachelor of Engineering	**Branch:**	CE
Year:	1st Year	**Semester:**	1
Course title:	Maths-I	**Course code**	23000001
Course type:	Engineering Science	**Course credit:**	5

CO 1	Analyze and manipulate infinite sequences and series.
CO 2	Evaluate limits involving indeterminate forms.
CO 3	Understand and apply techniques for improper integrals.
CO 4	Analyze functions of several variables and solve optimization problems.
CO 5	Solve systems of linear equations using matrices and determinants.

CO -PO Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	-	2	1	-	-	-	-	-	-	2
CO2	3	2	-	-	-	-	-	-	-	-	-	2
CO3	3	3	-	2	-	-	-	-	-	-	-	2
CO4	3	3	2	2	2	-	-	-	-	-	-	2
CO5	3	3	-	2	3	-	-	-	-	-	-	2

Note: High = 3, Medium = 2 and Low = 1

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF COMPUTER ENGINEERING

COURSE OUTCOME

Program:	Bachelor of Engineering	**Branch:**	CE
Year:	1st Year	**Semester:**	1
Course title:	Fundamentals of Computer Programming	**Course code**	23000004
Course type:	Engineering Science	**Course credit:**	3

CO 1	Apply fundamental principles of problem solving in software engineering.
CO 2	Apply basic programming principles using C language.
CO 3	Apply basic C program structure in software development
CO 4	Prepare graduates for professional careers in roles including, but not limited to, the fol1ing: computer programmer, software engineer, software systems designer, software applications developer, technical software project lead, computer systems analyst, computer systems programmer, software applications tester and maintainer.
CO 5	To prepare graduates with the knowledge and skills to do advanced studies and research in computer science and related engineering and scientific disciplines

CO -PO Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	2	3	–	–	–	2	2	2	3
CO2	3	3	3	2	3	–	–	–	–	2	2	3
CO3	3	2	3	2	3	–	–	–	–	2	2	3
CO4	3	3	3	2	3	1	–	1	3	3	3	3
CO5	3	2	2	3	2	–	–	–	–	2	2	3

Note: High = 3, Medium = 2 and Low = 1

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF COMPUTER ENGINEERING

COURSE OUTCOME

Program:	Bachelor of Engineering	**Branch:**	CE
Year:	1st Year	**Semester:**	1
Course title:	ELEMENTS OF ELECTRICAL ENGINEERING	**Course code**	23000012
Course type:	Engineering Science	**Course credit:**	5

CO 1	Apply fundamental principles of problem solving in software engineering.
CO 2	Apply basic programming principles using C language.
CO 3	Apply basic C program structure in software development
CO 4	Prepare graduates for professional careers in roles including, but not limited to, the fol1ing: computer programmer, software engineer, software systems designer, software applications developer, technical software project lead, computer systems analyst, computer systems programmer, software applications tester and maintainer.
CO 5	To prepare graduates with the knowledge and skills to do advanced studies and research in computer science and related engineering and scientific disciplines

CO -PO Mapping												
PO / CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	3	3	2	3	–	–	–	2	2	2	3
CO2	3	3	3	2	3	–	–	–	–	2	2	3
CO3	3	2	3	2	3	–	–	–	–	2	2	3
CO4	3	3	3	2	3	1	–	1	3	3	3	3
CO5	3	2	2	3	2	–	–	–	–	2	2	3

Note: High = 3, Medium = 2 and Low = 1

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF COMPUTER ENGINEERING

COURSE OUTCOME

Program:	Bachelor of Technology	**Branch:**	CE
Year:	First Year	**Semester:**	1
Course title:	Elements of Mechanical Engineering	**Course code**	23000003
Course type:	Engineering Science	**Course credit:**	5

CO1	Describe the various sources of energy and basic terminology of Mechanical engineering.
CO2	Make calculations for commonly used working fluids i.e. ideal gases and steam.
CO3	Analyze various heat engine cycles and understand construction and working of IC engines.
CO4	Discuss working and applications of steam boilers and various energy conversion systems.
CO5	Discuss various power transmission elements and properties of various engineering materials with their applications.

CO -PO Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	3	3	3	2	2	1	-	-	-	2
CO2	2	1	-	-	-	1	-	-	-	-	-	1
CO3	3	2	3	-	-	1	1	1	-	-	-	2
CO4	3	2	3	-	-	1	1	1	-	-	-	2
CO5	3	2	2	-	-	1	1	1	-	-	-	2

Note: High = 3, Medium = 2 and Low = 1

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF COMPUTER ENGINEERING

COURSE OUTCOME

Program:	Bachelor of Engineering	**Branch:**	CE
Year:	1st Year	**Semester:**	1
Course title:	Orientation Program in Start-up and Entrepreneurship	**Course code**	12300001
Course type:	Innovation and Entrepreneurship	**Course credit:**	3

CO 1	Apply the basic principles of entrepreneurship
CO 2	Distinguish the concepts of the entrepreneurship ecosystem, entrepreneurship education, and various entrepreneurial opportunities
CO 3	Understanding various individual attributes of entrepreneurial personality traits, entrepreneurial characteristics, behavioral attributes and importance of creativity and innovation.
CO 4	Develop an understanding of best techniques for idea generation and opportunities exploration.

CO -PO Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	3	2	-	-	-	-	-	-	-	2
CO2	2	3	1	3	-	-	-	-	-	-	-	1
CO3	1	3	2	3	-	-	-	-	-	-	-	2
CO4	2	2	2	2	-	-	-	-	-	-	-	2

Note: High = 3, Medium = 2 and Low = 1

SWARNIM INSTITUTE OF TECHNOLOGY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF COMPUTER ENGINEERING

COURSE OUTCOME

Program:	Bachelor of Engineering	**Branch:**	CE
Year:	1st Year	**Semester:**	1
Course title:	Electrical and Electronics Workshop	**Course code**	23000002
Course type:	Engineering Science	**Course credit:**	3

CO-1	Measure different electrical quantities.
CO-2	Understand the requirement and operation of safety devices
CO-3	Select the appropriate tools and components required for specific operation
CO-4	Wire and trouble shoot of house-hold appliances.

CO -PO Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	3	2	-	-	-	-	-	-	-	2
CO2	2	3	1	3	-	-	-	-	-	-	-	1
CO3	1	3	2	3	-	-	-	-	-	-	-	2
CO4	2	2	2	2	-	-	-	-	-	-	-	2

Note: High = 3, Medium = 2 and Low = 1

SWARRNIM INSTITUTE OF TECHNOLOGY
DEPARTMENT OF COMPUTER ENGINEERING
COURSE OUTCOME

Semester: 1

Program:	Bachelor of Engineering	**Branch:**	CE
Year:	1st Year	**Semester:**	1
Course title:	Fundamentals of Computer Programming	**Course code**	23000004
Course type:	Engineering Science	**Course credit:**	3

CO 1	Apply fundamental principles of problem solving in software engineering.
CO 2	Apply basic programming principles using C language.
CO 3	Apply basic C program structure in software development
CO 4	Prepare graduates for professional careers in roles including, but not limited to, the falling: computer programmer, software engineer, software systems designer, software applications developer, technical software project lead, computer systems analyst, computer systems programmer, software applications tester and maintainer.
CO 5	To prepare graduates with the knowledge and skills to do advanced studies and research in computer science and related engineering and scientific disciplines

CO	**Co –PO Mapping**											
	PO-1	**PO-2**	**PO-3**	**PO- 4**	**PO-5**	**PO- 6**	**PO-7**	**PO- 8**	**PO- 9**	**PO- 10**	**PO- 11**	**PO-12**
CO-1	3	3	3	2	3	–	–	–	2	2	2	3
CO-2	3	3	3	2	3	–	–	–	–	2	2	3
CO-3	3	2	3	2	3	–	–	–	–	2	2	3
CO-4	3	3	3	2	3	1	–	1	3	3	3	3
CO-5	3	2	2	3	2	–	–	–	–	2	2	3

Note: High = 3, Medium = 2 and Low = 1

SWARNIM INSTITUTE OF TECHNOLOGY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF COMPUTER ENGINEERING

COURSE OUTCOME

Program:	Bachelor of Engineering	**Branch:**	CE
Year:	1st Year	**Semester:**	1
Course title:	Orientation Program in Start-up and Entrepreneurship	**Course code**	12300001
Course type:	Innovation and Entrepreneurship	**Course credit:**	3

CO 1	Apply the basic principles of entrepreneurship
CO 2	Distinguish the concepts of the entrepreneurship ecosystem, entrepreneurship education, and various entrepreneurial opportunities
CO 3	Understanding various individual attributes of entrepreneurial personality traits, entrepreneurial characteristics, behavioral attributes and importance of creativity and innovation.
CO 4	Develop an understanding of best techniques for idea generation and opportunities exploration.

CO	**Co –PO Mapping**											
	PO- 1	**PO- 2**	**PO- 3**	**PO- 4**	**PO- 5**	**PO- 6**	**PO- 7**	**PO- 8**	**PO- 9**	**PO- 10**	**PO- 11**	**PO- 12**
CO- 1	3	2	3	2	-	-	-	-	-	-	-	-
CO- 2	2	3	1	3	-	-	-	-	-	-	-	-
CO- 3	1	3	2	3	-	-	-	-	-	-	-	-
CO- 4	2	2	2	2	-	-	-	-	-	-	-	-

Note: High = 3, Medium = 2 and Low = 1

SWARNIM INSTITUTE OF TECHNOLOGY

COMPUTER ENGINEERING
SEMESTER-2

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF COMPUTER ENGINEERING

COURSE OUTCOME

Program:	Bachelor of Engineering	**Branch:**	CE
Year:	1st Year	**Semester:**	2
Course title:	Engineering Physics	**Course code**	23000005
Course type:	Engineering Science	**Course credit:**	5

CO 1	Understand the basic concepts and classification of sound.
CO 2	Analyze applications of superconductors.
CO 3	Understand the fundamentals of laser radiation.
CO 4	Evaluate the applications of optical fibers.
CO 5	Apply dielectric materials in capacitors and transformers.

CO -PO Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	–	–	1	–	–	–	–	–	–	2
CO2	3	3	2	2	2	–	2	–	–	–	–	2
CO3	3	2	1	2	3	–	2	–	–	–	–	2
CO4	3	3	2	2	3	–	2	–	–	–	–	2
CO5	3	2	2	2	3	–	2	–	–	–	–	2

Note: High = 3, Medium = 2 and Low = 1

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF COMPUTER ENGINEERING

COURSE OUTCOME

Program:	Bachelor of Engineering	**Branch:**	CE
Year:	1st Year	**Semester:**	2
Course title:	Communication Skills	**Course code:**	23000008
Course type:	Engineering Science	**Course credit:**	3

CO-1	To improve students' communicative and linguistic approach in English.
CO-2	To provide an icebreaking technique using LSRW skills and soft skills
CO-3	To learn techniques to improve overall communication abilities and effective use of writing in the field of advertising and public relations.
CO-4	Improve communication skills through practicing debate, discussion and appearing in interview.
CO-5	Use of ethical consideration in order to develop good etiquettes both in online and offline communication.

CO -PO Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	-	-	-	-	-	-	2	3	-	2
CO2	-	-	-	-	-	-	-	-	2	3	-	2
CO3	-	-	-	-	-	-	-	2	2	3	-	2
CO4	-	-	-	-	-	-	-	-	3	3	-	2
CO5	-	-	-	-	-	2	-	3	2	2	-	2

Note: High = 3, Medium = 2 and Low = 1

SWARNIM INSTITUTE OF TECHNOLOGY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF COMPUTER ENGINEERING

COURSE OUTCOME

Program:	Bachelor of Engineering	**Branch:**	CE
Year:	1st Year	**Semester:**	2
Course title:	Basic Electronics	**Course code**	23000009
Course type:	Basic Science	**Course credit:**	5

CO 1	To study basics of semiconductor & devices and their applications in different areas.
CO 2	Demonstrate the operating principle and output characteristics of pn junction diodes, zener diode, Varactor diode, BJT, rectifiers and different diode circuits
CO 3	Compute and characterization of different biasing techniques to operate transistor ,FET , MOSFET and operational amplifier in different modes
CO 4	To implementation of basic digital gates using diode and basic family of logic families

CO -PO Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	1	1	2	1	-	-	-	1	-	2
CO2	3	3	3	1	2	3	-	-	-	1	-	-
CO3	3	3	3	2	3	2	-	-	-	1	-	-
CO4	3	2	3	3	2	1	-	-	3	1	-	-

Note: High = 3, Medium = 2 and Low = 1

SWARNIM INSTITUTE OF TECHNOLOGY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF COMPUTER ENGINEERING

COURSE OUTCOME

Program:	Bachelor of Engineering	**Branch:**	CE
Year:	1st Year	**Semester:**	2
Course title:	Maths-II	**Course code**	23000010
Course type:	Engineering Science	**Course credit:**	5

CO 1	Understand vectors in $R^n \times R^n$ and operations involving linear combinations.
CO 2	Identify subspaces and determine basis and dimension and Perform coordinate transformations and understand the change of basis.
CO 3	Understand linear transformations and their properties and represent linear transformations with matrices and explore the concept of similarity.
CO 4	Apply inner product spaces to least squares approximation and diagonalization of symmetric matrices and Explore applications of quadratic forms and optimization.
CO 5	Apply double and triple integrals over different regions and Utilize Fubini's theorem and change of variables in multiple integrals.
CO 6	Apply integration techniques to calculate volumes of various solids.

CO -PO Mapping												
PO / CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	2	-	-	-	-	-	-	-	-	-	2
CO2	3	2	1	-	-	-	-	-	-	-	-	2
CO3	3	2	1	-	1	-	-	-	-	-	-	2
CO4	3	2	-	2	-	-	-	-	-	-	-	2
CO5	3	2	-	2	3	-	-	-	-	-	-	2
CO6	3	2	-	-	3	-	-	-	-	-	-	2

Note: High = 3, Medium = 2 and Low = 1

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF COMPUTER ENGINEERING

COURSE OUTCOME

Program:	Bachelor of Technology	**Branch:**	CE
Year:	First Year	**Semester:**	**2**
Course title:	Engineering Graphics	**Course code**	23000011
Course type:	Engineering Science	**Course credit:**	4

CO1	Describe the fundamental methods of engineering drawing, sketching and drafting.
CO2	Understanding the object through orthographic projections.
CO3	Construct basic and intermediate geometry and application of engineering curves.
CO4	Enhance visualization skills for developing new products.
CO5	Develop new products through technical communication skill in the form of communicative drawings.
CO6	Develop the theory of orthographic projection and views.

CO -PO Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	3	2	-	2	-	1	2	2	-	1
CO2	2	3	3	3	-	2	-	2	2	2	-	1
CO3	2	3	3	2	3	-	-	-	-	3	-	2
CO4	2	2	3	1	-	-	-	-	-	3	-	2
CO5	3	2	2	2	-	-	-	-	2	3	2	2
CO6	2	2	3	-	3	-	-	-	-	-	-	2

Note: High = 3, Medium = 2 and Low = 1

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF COMPUTER ENGINEERING

COURSE OUTCOME

Program:	Bachelor of Engineering	**Branch:**	**CE**
Year:	1st Year	**Semester:**	2
Course title:	Basic Program in Entrepreneurship	**Course code**	12300002
Course type:	Innovation and Entrepreneurship	**Course credit:**	3

CO 1	Develop an understanding of best techniques for idea generation, opportunities exploration, and market research.
CO 2	Check technical, market, financial and other types of Feasibility of their business idea.
CO 3	Develop business model to describe the rationale of how an organization creates, delivers, and captures value
CO 4	Conduct the customer's survey to know the need of their business idea.

CO -PO Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	3	2	-	2	-	1	2	2	-	1
CO2	2	3	3	3	-	2	-	2	2	2	-	1
CO3	2	3	3	2	3	-	-	-	-	3	-	2
CO4	2	2	3	1	-	-	-	-	-	3	-	2

Note: High = 3, Medium = 2 and Low = 1

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF COMPUTER ENGINEERING

COURSE OUTCOME

Program:	Bachelor of Engineering	**Branch:**	CE
Year:	1st Year	**Semester:**	2
Course title:	Basic Program in Entrepreneurship	**Course code**	12300002
Course type:	Innovation and Entrepreneurship	**Course credit:**	3

CO 1	Develop an understanding of best techniques for idea generation, opportunities exploration, and market research.
CO 2	Check technical, market, financial and other types of Feasibility of their business idea.
CO 3	Develop business model to describe the rationale of how an organization creates, delivers, and captures value
CO 4	Conduct the customer's survey to know the need of their business idea.

CO	**Co –PO Mapping**											
	PO- 1	**PO- 2**	**PO- 3**	**PO- 4**	**PO- 5**	**PO- 6**	**PO- 7**	**PO- 8**	**PO- 9**	**PO-10**	**PO-11**	**PO-12**
CO- 1	3	3	3	3	-	-	-	-	-	-	-	-
CO- 2	2	2	1	2	-	-	-	-	-	-	-	-
CO- 3	1	2	2	1	-	-	-	-	-	-	-	-
CO- 4	2	1	2	2	-	-	-	-	-	-	-	-

Note: High = 3, Medium = 2 and Low = 1

COMPUTER ENGINEERING
SEMESTER-3

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF COMPUTER ENGINEERING

COURSE OUTCOME

Program:	Bachelor of Technology	**Branch:**	CE
Year:	2nd Year	**Semester:**	3
Course title:	Maths III	**Course Code:**	23000015
Course type:	Engineering Science	**Course Credit:**	5

CO 1	Apply Fourier series to analyze and represent periodic functions.
CO 2	Apply Laplace transforms to solve differential equations and system problems.
CO 3	Apply methods such as integrating factor, Bernoulli equations, and linear differential equations.
CO 4	Apply series solutions to solve differential equations and analyze the convergence and divergence of series solutions.
CO 5	Apply the method of separation of variables to solve PDEs to analyze solutions in cylindrical and spherical polar coordinates.

CO -PO Mapping												
PO / CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	2	-	2	1	-	-	-	-	1	-	2
CO2	3	3	-	3	2	-	-	-	-	1	-	2
CO3	3	3	1	3	1	-	-	-	-	-	-	2
CO4	3	3	-	2	1	-	-	-	-	1	-	3
CO5	3	2	-	2	1	-	2	-	-	1	-	3

Note: High = 3, Medium = 2 and Low = 1

SWARRNIM INSTITUTE OF TECHNOLOGY
DEPARTMENT OF COMPUTER ENGINEERING
COURSE OUTCOME

Semester: 3

Program:	Bachelor of Engineering	**Branch:**	CE
Year:	2nd Year	**Semester:**	3
Course title:	Data Structure And Algorithm	**Course code**	23040302
Course type:	Engineering Science	**Course credit:**	4

CO 1	Learn the basic types for data structure, implementation and application.
CO 2	Know the strength and weakness of different data structures.
CO 3	Use the appropriate data structure in context of solution of given problem.
CO 4	Develop programming skills which require solving given problem.
CO 5	Learn the data structure, implementation and application.

CO	**Co –PO Mapping**											
	PO- 1	**PO- 2**	**PO- 3**	**PO- 4**	**PO- 5**	**PO- 6**	**PO- 7**	**PO- 8**	**PO- 9**	**PO- 10**	**PO - 11**	**PO - 12**
CO- 1	3	2	2	1	3	–	–	–	–	1	–	3
CO- 2	3	2	2	2	2	–	–	–	–	1	–	3
CO- 3	3	3	3	2	3	–	–	–	–	1	–	3
CO- 4	3	3	3	2	3	–	–	–	1	2	1	3
CO- 5	3	2	2	1	3	–	–	–	–	1	–	3

Note: High = 3, Medium = 2 and Low = 1

SWARRNIM INSTITUTE OF TECHNOLOGY
DEPARTMENT OF COMPUTER ENGINEERING
COURSE OUTCOME

Program:	Bachelor of Engineering	**Branch:**	CE
Year:	2nd Year	**Semester:**	3
Course title:	Database Management System	**Course code**	23040301
Course type:	Engineering Science	**Course credit:**	5

CO 1	Understand the basic concepts of database management systems.
CO 2	Apply SQL to find solutions to a broad range of queries.
CO 3	Apply normalization techniques to improve database design.
CO 4	Analyze a given database application scenario to use ER model.
CO 5	conceptual design of the database.

CO	**Co –PO Mapping**											
	PO- 1	**PO- 2**	**PO- 3**	**PO- 4**	**PO- 5**	**PO- 6**	**PO- 7**	**PO- 8**	**PO- 9**	**PO- 10**	**PO- 11**	**PO- 12**
CO- 1	3	2	2	1	3	–	–	–	–	1	–	3
CO- 2	3	2	3	2	3	–	–	–	–	1	–	3
CO- 3	3	3	3	2	3	–	–	–	–	1	–	3
CO- 4	3	3	3	2	3	–	–	–	–	2	–	3
CO- 5	3	3	3	2	3	–	–	–	–	2	–	3

Note: High = 3, Medium = 2 and Low = 1

SWARRNIM INSTITUTE OF TECHNOLOGY
DEPARTMENT OF COMPUTER ENGINEERING
COURSE OUTCOME

Program:	Bachelor of Engineering	**Branch:**	CE
Year:	2nd Year	**Semester:**	3
Course title:	Computer Network	**Course code**	23040303
Course type:	Engineering Science	**Course credit:**	4

CO 1	Understand the fundamental concepts of computer networks, including network edge, core, delay, loss, throughput, and protocol layers.
CO 2	Analyze error detection and correction techniques, multiple access protocols, and Ethernet switching in the link layer and local area networks.
CO 3	Demonstrate knowledge of network layer functions, including IP addressing, routing algorithms, and virtual/datagram networks.
CO 4	Explain transport layer services such as UDP, TCP, reliable data transfer, congestion control, and multiplexing/de multiplexing.
CO 5	Evaluate the role of different network protocols and routing techniques in improving network performance and reliability.

CO	**Co –PO Mapping**											
	PO-1	**PO- 2**	**PO- 3**	**PO- 4**	**PO- 5**	**PO- 6**	**PO- 7**	**PO- 8**	**PO- 9**	**PO-10**	**PO-11**	**PO-12**
CO-1	3	2	2	2	3	–	–	–	–	1	–	3
CO-2	3	3	2	2	3	–	–	–	–	1	–	3
CO-3	3	3	3	2	3	–	–	–	–	1	–	3
CO-4	3	3	3	2	3	–	–	–	–	1	–	3
CO-5	3	3	2	2	3	–	–	–	–	1	–	3

Note: High = 3, Medium = 2 and Low = 1

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF COMPUTER ENGINEERING

COURSE OUTCOME

Program:	Bachelor of Engineering	**Branch:**	CE
Year:	2nd Year	**Semester:**	3
Course title:	Foundation Program in Entrepreneurship	**Course code**	12300003
Course type:	Innovation and Entrepreneurship	**Course credit:**	3

CO 1	Apply the basic principles of entrepreneurial finance.
CO 2	Understand the importance of industrial collaborations.
CO 3	Acquire funds from different sources for seed funding.
CO 4	Prepare guideline for earning maximum profits with minimum cost.
CO 5	Explore Entrepreneurial ecosystem support for start-ups.

CO	**Co –PO Mapping**											
	PO- 1	**PO- 2**	**PO- 3**	**PO- 4**	**PO- 5**	**PO- 6**	**PO- 7**	**PO- 8**	**PO- 9**	**PO- 10**	**PO- 11**	**PO- 12**
CO- 1	3	3	2	3	2	-	-	-	-	-	-	-
CO- 2	1	2	3	2	3	-	-	-	-	-	-	-
CO- 3	2	2	2	2	2	-	-	-	-	-	-	-
CO- 4	2	2	1	2	1	-	-	-	-	-	-	-
CO- 5	2	3	3	3	3	-	-	-	-	-	-	-

Note: High = 3, Medium = 2 and Low = 1

COMPUTER ENGINEERING
SEMESTER-4

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF COMPUTER ENGINEERING

COURSE OUTCOME

Program:	Bachelor of Engineering	**Branch:**	CE/IT
Year:	2nd Year	**Semester:**	4
Course title:	Maths-IV	**Course code**	23000018
Course type:	Engineering Science	**Course credit:**	5

CO 1	Apply methods to handle approximations, errors, and significant figures.
CO 2	Analyze and solve engineering problems using root-finding techniques.
CO 3	Solve systems of linear equations using Gauss elimination, Gauss–Seidel methods, and their applications.
CO 4	Apply least squares linear and polynomial regression for data fitting.
CO 5	Apply numerical integration techniques such as the trapezoidal rule and Simpson's rules to solve engineering problems involving numerical integration through case studies

CO -PO Mapping												
PO / CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	2	–	2	2	–	–	–	–	–	–	2
CO2	3	3	–	3	3	–	–	–	–	–	–	2
CO3	3	3	–	2	2	–	–	–	–	–	–	2
CO4	3	3	–	3	2	–	–	–	–	–	–	2
CO5	3	3	–	2	3	–	–	–	–	–	–	2

Note: High = 3, Medium = 2 and Low = 1

SWARNIM INSTITUTE OF TECHNOLOGY

SWARRNIM INSTITUTE OF TECHNOLOGY
DEPARTMENT OF COMPUTER ENGINEERING
COURSE OUTCOME

Semester-4

Program:	Bachelor of Engineering	Branch:	CE
Year:	2nd Year	Semester:	4
Course title:	Operating System	Course code	23040401
Course type:	Engineering Science	Course Credit	4

CO- 1	Understand the fundamental concepts of Operating Systems, including their evolution, types, structures, and system calls.
CO- 2	Analyze process management techniques, including process scheduling, multithreading, and inter-process communication mechanisms.
CO- 3	Demonstrate knowledge of deadlock handling strategies, including prevention, avoidance, detection, and recovery techniques.
CO- 4	Explain memory management concepts such as paging, segmentation, virtual memory, and page replacement policies.
CO- 5	Evaluate various I/O management strategies, file systems, disk scheduling algorithms, and storage structures.
CO-6	Explore Unix/Linux operating systems, including kernel functionalities, system administration, and shell programming.

CO	**Co –PO Mapping**											
	PO- 1	**PO- 2**	**PO- 3**	**PO- 4**	**PO- 5**	**PO- 6**	**PO- 7**	**PO- 8**	**PO- 9**	**PO- 10**	**PO- 11**	**PO- 12**
CO- 1	3	2	2	1	2	–	–	–	–	1	–	3
CO- 2	3	3	3	2	3	–	–	–	–	1	–	3
CO- 3	3	3	3	2	3	–	–	–	–	1	–	3
CO- 4	3	2	3	2	3	–	–	–	–	1	–	3
CO- 5	3	2	2	2	3	–	–	–	–	1	–	3
CO- 6	3	2	3	1	3	–	–	–	–	2	1	3

Note: High = 3, Medium = 2 and Low = 1

SWARRNIM INSTITUTE OF TECHNOLOGY
DEPARTMENT OF COMPUTER ENGINEERING
COURSE OUTCOME

Program:	Bachelor of Engineering	Branch:	CE
Year:	2nd Year	Semester:	4
Course title:	Object Oriented Programming with C++	Course code	23040402
Course type:	Engineering Science	Course Credit	5

CO 1	Understand the fundamental concepts of Object-Oriented Programming (OOP), its principles, benefits, and applications.
CO 2	Apply basic C++ programming concepts, including program structure, control structures, data types, and operators.
CO 3	Implement functions in C++, including inline functions, function overloading, default arguments, and virtual functions.
CO 4	Develop object-oriented solutions using classes, objects, constructors, destructors, and operator overloading.
CO 5	Demonstrate inheritance concepts, including different types of inheritance and method overriding.

CO	**Co –PO Mapping**											
	PO-1	**PO- 2**	**PO- 3**	**PO- 4**	**PO- 5**	**PO-6**	**PO-7**	**PO- 8**	**PO- 9**	**PO-10**	**PO-11**	**PO-12**
CO- 1	3	2	2	1	2	–	–	–	–	1	–	3
CO- 2	3	2	3	1	3	–	–	–	–	1	–	3
CO- 3	3	2	3	2	3	–	–	–	–	1	–	3
CO- 4	3	2	3	2	3	–	–	–	–	1	–	3
CO- 5	3	2	3	2	3	–	–	–	–	1	–	3

Note: High = 3, Medium = 2 and Low = 1

SWARRNIM INSTITUTE OF TECHNOLOGY
DEPARTMENT OF COMPUTER ENGINEERING
COURSE OUTCOME

Program:	Bachelor of Engineering	**Branch:**	CE
Year:	2nd Year	**Semester:**	4
Course title:	System Software	**Course code**	**23040403**
Course type:	Engineering Science	**Course Credit**	4

CO 1	To understand the relationship between system software and machine.
CO 2	To understand architecture..
CO 3	To understand the processing of an HLL program for execution on a computer.
CO 4	To understand the process of scanning and parsing.
CO 5	To know the design and implementation of assemblers, macro processor, linker.

CO	**Co –PO Mapping**											
	PO-1	**PO- 2**	**PO- 3**	**PO- 4**	**PO- 5**	**PO-6**	**PO-7**	**PO- 8**	**PO- 9**	**PO- 10**	**PO- 11**	**PO-12**
CO-1	3	2	2	1	2	–	–	–	–	1	–	3
CO-2	3	2	2	1	2	–	–	–	–	1	–	3
CO-3	3	2	3	2	3	–	–	–	–	1	–	3
CO-4	3	3	3	2	3	–	–	–	–	1	–	3
CO-5	3	3	3	2	3	–	–	–	–	1	–	3

Note: High = 3, Medium = 2 and Low = 1

SWARRNIM INSTITUTE OF TECHNOLOGY
DEPARTMENT OF COMPUTER ENGINEERING
COURSE OUTCOME

Program:	Bachelor of Engineering	**Branch:**	CE
Year:	2nd Year	**Semester:**	4
Course title:	Computer Organization and Microprocessor	**Course code**	**23070401**
Course type:	Engineering Science	**Course Credit**	4

CO 1	To know the background of internal communication of computer.
CO 2	To have better idea on how to write assemble language programs.
CO 3	To be clear with memory management techniques.
CO 4	To better with IO devices communication with processor.
CO 5	To notice how to perform computer arithmetic operations.

CO	**Co –PO Mapping**											
	PO-1	**PO- 2**	**PO- 3**	**PO- 4**	**PO- 5**	**PO-6**	**PO-7**	**PO-8**	**PO- 9**	**PO- 10**	**PO- 11**	**PO-12**
CO-1	3	2	2	1	2	-	-	-	2	1	1	2
CO-2	3	3	2	1	2	-	-	-	2	1	1	2
CO-3	3	3	3	1	3	-	-	-	2	1	1	2
CO-4	3	2	2	1	2	-	-	-	2	1	1	2
CO-5	3	2	3	1	3	-	-	-	2	1	1	2

Note: High = 3, Medium = 2 and Low = 1

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF COMPUTER ENGINEERING

COURSE OUTCOME

Program:	Bachelor of Engineering	**Branch:**	CE
Year:	2nd Year	**Semester:**	4
Course title:	Intermediate Program in Entrepreneurship	**Course code**	12300004
Course type:	Innovation and Entrepreneurship	**Course credit:**	3

CO 1	Design marketing and sales strategy for a venture
CO 2	Understand new product design and development procedure.
CO 3	Register any one form of business.
CO 4	Make pitch deck to present business idea to different stakeholders.

CO	**Co –PO Mapping**											
	PO- 1	**PO- 2**	**PO- 3**	**PO- 4**	**PO- 5**	**PO- 6**	**PO- 7**	**PO- 8**	**PO- 9**	**PO- 10**	**PO- 11**	**PO- 12**
CO- 1	3	2	3	2	-	-	-	-	-	-	-	-
CO- 2	2	2	1	1	-	-	-	-	-	-	-	-
CO- 3	2	1	3	3	-	-	-	-	-	-	-	-
CO- 4	3	2	3	2	-	-	-	-	-	-	-	-

Note: High = 3, Medium = 2 and Low = 1

SWARNIM INSTITUTE OF TECHNOLOGY

COMPUTER ENGINEERING
SEMESTER-5

SWARRNIM INSTITUTE OF TECHNOLOGY
DEPARTMENT OF COMPUTER ENGINEERING
COURSE OUTCOME

Semester: 5

Program:	Bachelor of Engineering	**Branch:**	CE
Year:	3rd Year	**Semester:**	5
Course title:	Object Oriented Programming with JAVA	**Course code**	**23040501**
Course type:	Engineering Science	**Course Credit**	6

CO 1	Able to solve real world problems using OOP techniques.
CO 2	Able to understand the use of abstract classes.
CO 3	Able to solve problems using java collection framework and I/o classes.
CO 4	Able to develop multithreaded applications with synchronization.
CO 5	Able to develop applets for web applications.

CO	**Co –PO Mapping**											
	PO-1	**PO- 2**	**PO- 3**	**PO- 4**	**PO- 5**	**PO- 6**	**PO- 7**	**PO- 8**	**PO- 9**	**PO-10**	**PO-11**	**PO-12**
CO-1	3	3	3	1	3	-	-	-	2	2	1	2
CO-2	3	2	3	1	3	-	-	-	2	2	1	2
CO-3	3	3	3	1	3	2	-	-	2	2	1	2
CO-4	3	3	3	3	3	3	-	-	2	2	1	2
CO-5	3	2	3	1	3	-	2	2	2	2	1	2

Note: High = 3, Medium = 2 and Low = 1

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF COMPUTER ENGINEERING

COURSE OUTCOME

Program:	Bachelor of Engineering	**Branch:**	CE
Year:	3rd Year	**Semester:**	5
Course title:	Intellectual Property Rights	**Course code**	12300005
Course type:	Innovation and Entrepreneurship	**Course credit:**	3

CO 1	The students once they complete their academic projects, shall get an adequate knowledge on patent and copyright for their innovative research works.
CO 2	During their research career, information in patent documents provide useful insight on novelty of their idea from state-of-the art search. This provide further way for developing their idea or innovations.
CO 3	Pave the way for the students to catch up Intellectual Property(IP) as an career option as a R&D IP Counsel, Government Jobs as Patent Examiner, Private Jobs in any corporate, Patent agent and Trademark agent and as an Entrepreneur.

CO	**Co –PO Mapping**											
	PO- 1	**PO- 2**	**PO- 3**	**PO- 4**	**PO- 5**	**PO- 6**	**PO- 7**	**PO- 8**	**PO- 9**	**PO- 10**	**PO- 11**	**PO- 12**
CO- 1	2	2	3	-	-	-	-	-	-	-	-	-
CO- 2	3	3	1	-	-	-	-	-	-	-	-	-
CO- 3	2	2	2	-	-	-	-	-	-	-	-	-

Note: High = 3, Medium = 2 and Low = 1

SWARRNIM INSTITUTE OF TECHNOLOGY
DEPARTMENT OF COMPUTER ENGINEERING
COURSE OUTCOME

Program:	Bachelor of Engineering	**Branch:**	CE
Year:	3rd Year	**Semester:**	5
Course title:	Information Network & Cyber Security	**Course code**	**23040503**
Course type:	Engineering Science	**Course Credit**	4

CO 1	Understand the fundamental concepts of cryptography, including symmetric and asymmetric key models, and their applications in securing data.
CO 2	Analyze different cryptographic techniques such as substitution, transposition, stream ciphers, and block ciphers, including their structures and operational principles.
CO 3	Evaluate the security features and transformation functions of encryption standards like DES and AES, and understand the Cipher Block Chaining (CBC) mode of operation.
CO 4	Apply public key cryptographic techniques, including RSA and Daffier-Hellman key exchange algorithms, to secure communication channels.
CO 5	Understand and implement secure hashing mechanisms, digital signatures, and key management strategies to maintain data integrity and authenticity.

CO	**Co –PO Mapping**											
	PO-1	**PO- 2**	**PO- 3**	**PO- 4**	**PO- 5**	**PO- 6**	**PO-7**	**PO- 8**	**PO- 9**	**PO-10**	**PO-11**	**PO-12**
CO-1	3	2	2	–	2	–	–	1	–	1	–	3
CO-2	3	3	2	2	2	–	–	–	–	1	–	3
CO-3	3	3	2	2	2	–	–	–	–	–	–	3
CO-4	3	3	2	–	2	–	–	1	–	–	–	3
CO-5	3	2	2	–	3	–	–	2	–	–	–	3

Note: High = 3, Medium = 2 and Low = 1

SWARRNIM INSTITUTE OF TECHNOLOGY
DEPARTMENT OF COMPUTER ENGINEERING
COURSE OUTCOME

Program:	Bachelor of Engineering	**Branch:**	CE
Year:	3rd Year	**Semester:**	5
Course title:	Web Technology	**Course code**	**23040504**
Course type:	Engineering Science	**Course Credit**	4

CO 1	Understand the foundational concepts of the Internet, the World Wide Web, HTTP protocol, web browsers and servers, and Web 2.0 features, along with principles of effective web design and site navigation.
CO 2	Apply basic HTML elements such as text formatting, hyperlinks, tables, images, and meta tags to create structured and interactive web pages.
CO 3	Develop websites using advanced HTML elements including character entities, frames, frame sets, and understand browser architecture and website structure.
CO 4	Create responsive and semantic web forms using HTML and HTML5, incorporating various input types and new HTML5 elements.
CO 5	Design and style web pages using CSS2 and CSS3, applying layout properties, background customization, text and font styling, box models, and positioning.

CO	**Co –PO Mapping**											
	PO-1	**PO- 2**	**PO- 3**	**PO- 4**	**PO- 5**	**PO- 6**	**PO- 7**	**PO-8**	**PO- 9**	**PO-10**	**PO-11**	**PO-12**
CO-1	2	2	2	1	2	1	–	–	–	2	2	3
CO-2	3	2	2	–	3	–	–	–	–	2	–	2
CO-3	3	2	2	–	3	–	–	–	–	2	–	3
CO-4	3	2	3	–	3	–	–	–	–	2	–	3
CO-5	3	2	3	–	3	–	–	–	–	2	–	3

Note: High = 3, Medium = 2 and Low = 1

SWARRNIM INSTITUTE OF TECHNOLOGY
DEPARTMENT OF COMPUTER ENGINEERING
COURSE OUTCOME

Program:	Bachelor of Engineering	**Branch:**	CE
Year:	3rd Year	**Semester:**	5
Course title:	Theory of Computation	**Course code**	**23040502**
Course type:	Engineering Science	**Course Credit**	4

CO 1	Understand fundamental mathematical concepts including sets, functions, logic, proofs, relations, and recursive definitions essential for formal language theory.
CO 2	Apply the concepts of regular languages and finite automata, including DFA, NFA, ε-NFA, their inter conversion, minimization, and use of regular expressions.
CO 3	Analyze and construct context-free grammars (CFG), evaluate ambiguity, and perform simplification and transformation using normal forms like CNF and GNF.
CO 4	Design and simulate Pushdown Automata (PDA) for context-free languages and understand their correspondence with CFGs.
CO 5	Understand and analyze Turing Machines and its variants, including Universal TM and Non-deterministic TM, and explore computational models like Two-Stack PDA.

CO	**Co –PO Mapping**											
	PO-1	**PO- 2**	**PO- 3**	**PO- 4**	**PO- 5**	**PO-6**	**PO-7**	**PO-8**	**PO-9**	**PO-10**	**PO-11**	**PO-12**
CO-1	3	2	1	–	–	–	–	–	–	–	–	3
CO-2	3	3	2	2	2	–	–	–	–	–	–	3
CO-3	3	3	2	2	–	–	–	–	–	1	–	3
CO-4	3	3	3	2	–	–	–	–	–	–	–	3
CO-5	3	3	2	2	–	–	–	–	–	–	–	3

Note: High = 3, Medium = 2 and Low = 1

SWARRNIM INSTITUTE OF TECHNOLOGY
DEPARTMENT OF COMPUTER ENGINEERING
COURSE OUTCOME

Program:	Bachelor of Engineering	**Branch:**	CE
Year:	3rd Year	**Semester:**	5
Course title:	Image Processing	**Course code**	**23040507**
Course type:	Engineering Science	**Course Credit**	4

CO 1	Discuss the processes involved in design Engineering
CO 2	Analyze interesting interaction of various segments of humanities, disciplines and engineering in the progress of a design
CO 3	Analyze use of AEIOU framework, logbook, mind mapping for the observation.
CO 4	Identify the flow of the system and design the system accordingly.
CO 5	Define the problem domain by identifying the various product functions and features and compile the product development canvas.

CO	**Co –PO Mapping**											
	PO- 1	**PO- 2**	**PO- 3**	**PO- 4**	**PO- 5**	**PO- 6**	**PO- 7**	**PO- 8**	**PO- 9**	**PO- 10**	**PO- 11**	**PO- 12**
CO-1	3	2	2	2	2	1	–	–	2	2	2	3
CO-2	2	3	2	1	–	2	2	–	2	2	–	3
CO-3	3	3	2	2	2	–	–	–	2	2	–	3
CO-4	3	3	3	2	2	–	–	–	2	1	–	3
CO-5	3	3	3	2	2	1	–	–	2	2	2	3

Note: High = 3, Medium = 2 and Low = 1

COMPUTER ENGINEERING
SEMESTER-6

SWARRNIM INSTITUTE OF TECHNOLOGY
DEPARTMENT OF COMPUTER ENGINEERING
COURSE OUTCOME

Semester: 6

Program:	Bachelor of Engineering	**Branch:**	**CE**
Year:	3rd Year	**Semester:**	**6**
Course title:	Wireless Network	**Course code**	**23040601**
Course type:	Engineering Science	**Course Credit**	**4**

CO-1	Understand the architecture and characteristics of 3G/4G and WiMAX wireless networks.
CO- 2	Design and implement wireless network environments using appropriate protocols and standards.
CO- 3	Evaluate the role of wireless communication protocols in mobile computing environments.
CO- 4	Develop and deploy applications for smart phones and mobile devices using modern wireless technologies.
CO- 5	Assess the strategies and challenges in implementing smart network-based applications in real-world scenarios.

CO	**Co –PO Mapping**											
	PO- 1	**PO- 2**	**PO- 3**	**PO- 4**	**PO- 5**	**PO- 6**	**PO- 7**	**PO - 8**	**PO- 9**	**PO- 10**	**PO- 11**	**PO- 12**
CO - 1	3	2	2	2	3	2	2	–	–	1	–	3
CO - 2	3	3	3	2	3	2	2	–	2	2	2	3
CO - 3	3	3	2	2	3	2	2	–	–	1	–	3
CO - 4	3	3	3	2	3	1	2	–	2	2	2	3
CO - 5	3	3	2	2	3	3	2	–	2	2	2	3

Note: High = 3, Medium = 2 and Low = 1

SWARRNIM INSTITUTE OF TECHNOLOGY
DEPARTMENT OF COMPUTER ENGINEERING
COURSE OUTCOME

Program:	Bachelor of Engineering	**Branch:**	CE
Year:	3rd Year	**Semester:**	6
Course title:	Compiler Design	**Course code**	**23040602**
Course type:	Engineering Science	**Course Credit**	4

CO 1	Realize basics of compiler design and apply for real time applications.
CO 2	To introduce different translation languages
CO 3	To understand the importance of code optimization
CO 4	To know about compiler generation tools and techniques
CO 5	To learn working of compiler and non compiler applications

CO	**Co –PO Mapping**											
	PO-1	**PO-2**	**PO- 3**	**PO- 4**	**PO-5**	**PO-6**	**PO-7**	**PO-8**	**PO- 9**	**PO- 10**	**PO- 11**	**PO-12**
CO-1	3	2	2	2	3	–	–	–	–	1	–	3
CO-2	3	2	2	1	3	–	–	–	–	1	–	3
CO-3	3	3	2	2	3	–	–	–	–	1	–	3
CO-4	3	2	3	2	3	–	–	–	–	1	–	3
CO-5	3	2	2	2	3	–	–	–	–	1	–	3

Note: High = 3, Medium = 2 and Low = 1

SWARRNIM INSTITUTE OF TECHNOLOGY
DEPARTMENT OF COMPUTER ENGINEERING
COURSE OUTCOME

Program:	Bachelor of Engineering	**Branch:**	CE
Year:	3rd Year	**Semester:**	6
Course title:	Cloud Computing	**Course code**	**23040603**
Course type:	Engineering Science	**Course Credit**	4

CO 1	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.
CO 2	Apply the fundamental concepts in datacenters to understand the tradeoffs in power, efficiency and cost.
CO 3	Identify resource management fundamentals, i.e. resource abstraction, sharing and sandboxing and outline their role in managing infrastructure in cloud computing.
CO 4	Analyze various cloud programming models and apply them to solve problems on the cloud.
CO 5	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.

CO	**Co –PO Mapping**											
	PO-1	**PO- 2**	**PO- 3**	**PO- 4**	**PO-5**	**PO- 6**	**PO- 7**	**PO-8**	**PO- 9**	**PO- 10**	**PO- 11**	**PO-12**
CO-1	3	2	2	1	2	2	2	–	–	2	–	3
CO-2	3	3	2	2	3	2	2	–	–	2	2	3
CO-3	3	3	2	2	3	–	–	–	–	1	–	3
CO-4	3	3	3	2	3	–	–	–	–	2	–	3
CO-5	3	2	2	1	2	2	2	–	–	2	–	3

Note: High = 3, Medium = 2 and Low = 1

SWARRNIM INSTITUTE OF TECHNOLOGY
DEPARTMENT OF COMPUTER ENGINEERING
COURSE OUTCOME

Program:	Bachelor of Engineering	**Branch:**	CE
Year:	3rd Year	**Semester:**	6
Course title:	Data Mining and Warehousing	**Course code**	**23040604**
Course type:	Engineering Science	**Course Credit**	4

CO 1	Be familiar with mathematical foundations of data mining tools.
CO 2	Understand and implement classical models and algorithms in data warehouses and
CO 3	data mining discovered by association rule
CO 4	Characterize the kinds of patterns that can be discovered by association rule
CO 5	Data mining, classification and clustering.

CO	**Co –PO Mapping**											
	PO-1	**PO-2**	**PO- 3**	**PO- 4**	**PO-5**	**PO-6**	**PO-7**	**PO-8**	**PO- 9**	**PO- 10**	**PO- 11**	**PO-12**
CO-1	3	2	2	1	2	–	–	–	–	1	–	3
CO-2	3	3	3	2	3	–	–	–	–	1	–	3
CO-3	3	2	2	2	2	–	–	–	–	1	–	3
CO-4	3	2	2	2	2	–	–	–	–	1	–	3
CO-5	3	3	3	2	3	–	–	–	–	1	–	3

Note: High = 3, Medium = 2 and Low = 1

SWARRNIM INSTITUTE OF TECHNOLOGY
DEPARTMENT OF COMPUTER ENGINEERING
COURSE OUTCOME

Program:	Bachelor of Engineering	**Branch:**	CE
Year:	3rd Year	**Semester:**	6
Course title:	Advance JAVA	**Course code**	**23040606**
Course type:	Engineering Science	**Course Credit**	5

CO 1	Able to solve real world problems using OOP techniques.
CO 2	Able to understand the use of abstract classes.
CO 3	Able to solve problems using java collection framework and I/o classes.
CO 4	Able to develop multithreaded applications with synchronization.
CO 5	Able to develop applets for web applications.

CO	**Co –PO Mapping**											
	PO-1	**PO- 2**	**PO- 3**	**PO- 4**	**PO-5**	**PO- 6**	**PO- 7**	**PO-8**	**PO- 9**	**PO-10**	**PO-11**	**PO-12**
CO-1	3	2	3	2	3	–	–	–	2	2	2	3
CO-2	3	2	2	1	3	–	–	–	–	1	–	3
CO-3	3	2	3	2	3	–	–	–	1	1	–	3
CO-4	3	2	3	2	3	–	–	–	1	2	–	3
CO-5	3	2	2	2	3	–	–	–	1	2	2	3

Note: High = 3, Medium = 2 and Low = 1

SWARNIM INSTITUTE OF TECHNOLOGY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF COMPUTER ENGINEERING

COURSE OUTCOME

Program:	Bachelor of Engineering	**Branch:**	CE
Year:	3rd Year	**Semester:**	6
Course title:	Expert Program in Entrepreneurship	**Course code**	12300006
Course type:	Innovation and Entrepreneurship	**Course credit:**	3

CO 1	Apply the basic principles of Start-up scalability
CO 2	Understanding various individual attributes of strategic business plan development
CO 3	Develop strategies for start-ups growth.
CO 4	Experience real world financial modeling and valuation through IPO.

CO	**Co –PO Mapping**											
	PO- 1	**PO- 2**	**PO- 3**	**PO- 4**	**PO- 5**	**PO- 6**	**PO- 7**	**PO- 8**	**PO- 9**	**PO- 10**	**PO- 11**	**PO- 12**
CO- 1	3	3	3	3	-	-	-	-	-	-	-	-
CO- 2	2	2	1	2	-	-	-	-	-	-	-	-
CO- 3	1	2	2	1	-	-	-	-	-	-	-	-
CO- 4	3	2	3	2		-	-	-	-	-	-	-

Note: High = 3, Medium = 2 and Low = 1

COMPUTER ENGINEERING
SEMESTER-7

SWARRNIM INSTITUTE OF TECHNOLOGY
DEPARTMENT OF COMPUTER ENGINEERING
COURSE OUTCOME

Semester: 7

Program:	Bachelor of Engineering	**Branch:**	CE
Year:	4th Year	**Semester:**	7
Course title:	Artificial Intelligence	**Course code**	**23040701**
Course type:	Engineering Science	**Course Credit**	6

CO 1	Understand the foundational concepts and applications of Artificial Intelligence.
CO 2	Apply and compare uninformed and informed search techniques for problem-solving.
CO 3	Apply logical reasoning and representation techniques for knowledge modeling.
CO 4	Analyze adversarial search strategies and apply minimax and alpha-beta pruning.
CO 5	Use Prolog for AI programming and problem-solving.

CO	**Co –PO Mapping**											
	PO-1	**PO-2**	**PO- 3**	**PO- 4**	**PO- 5**	**PO-6**	**PO- 7**	**PO-8**	**PO- 9**	**PO- 10**	**PO- 11**	**PO-12**
CO-1	3	2	2	1	2	2	1	1	1	2	1	3
CO-2	3	3	3	2	3	-	-	-	2	2	1	3
CO-3	3	3	3	2	2	-	-	-	2	2	1	3
CO-4	3	3	3	2	2	-	-	-	2	2	1	3
CO-5	3	2	3	2	3	-	-	-	2	2	1	3

Note: High = 3, Medium = 2 and Low = 1

SWARRNIM INSTITUTE OF TECHNOLOGY
DEPARTMENT OF COMPUTER ENGINEERING
COURSE OUTCOME

Program:	Bachelor of Engineering	**Branch:**	CE
Year:	4th Year	**Semester:**	7
Course title:	Python Programming	**Course code**	**23040702**
Course type:	Engineering Science	**Course Credit**	5

CO 1	Develop proficiency in creating applications using Python Programming Language.
CO 2	Apply various Python data structures to solve computational problems.
CO 3	Perform testing and debugging of Python programs effectively.
CO 4	Create and customize visualizations using PyLab for data representation.
CO 5	Utilize regular expressions for text filtering in Python applications.

CO	**Co –PO Mapping**											
	PO-1	**PO- 2**	**PO- 3**	**PO- 4**	**PO-5**	**PO- 6**	**PO- 7**	**PO-8**	**PO- 9**	**PO- 10**	**PO- 11**	**PO-12**
CO-1	3	2	3	1	3	–	–	–	2	2	2	3
CO-2	3	3	3	2	3	–	–	–	1	2	–	3
CO-3	2	3	2	2	3	–	–	–	–	2	–	3
CO-4	2	2	2	1	3	–	–	–	–	2	–	3
CO-5	3	2	2	1	3	–	–	–	–	2	–	3

Note: High = 3, Medium = 2 and Low = 1

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF COMPUTER ENGINEERING

COURSE OUTCOME

Program:	Bachelor of Engineering	**Branch:**	CE
Year:	4th Year	**Semester:**	7
Course title:	Start-Up Project Part-1	**Course code**	12300007
Course type:	Innovation and Entrepreneurship	**Course credit:**	1.5

CO 1	Initiate a start-up in team.
CO 2	Register it as any form of business.
CO 3	Develop a team to run the venture.
CO 4	Collaborate with government and industry fraternity.

CO	**Co –PO Mapping**											
	PO- 1	**PO- 2**	**PO- 3**	**PO- 4**	**PO- 5**	**PO- 6**	**PO- 7**	**PO- 8**	**PO- 9**	**PO- 10**	**PO- 11**	**PO- 12**
CO- 1	3	3	3	3	-	-	-	-	-	-	-	-
CO- 2	2	2	1	2	-	-	-	-	-	-	-	-
CO- 3	1	2	2	1	-	-	-	-	-	-	-	-
CO- 4	3	1	3	2	-	-	-	-	-	-	-	-

Note: High = 3, Medium = 2 and Low = 1

SWARNIM INSTITUTE OF TECHNOLOGY

COMPUTER ENGINEERING
SEMESTER-8

SWARRNIM INSTITUTE OF TECHNOLOGY
DEPARTMENT OF COMPUTER ENGINEERING
COURSE OUTCOME

Semester: 8

Program:	Bachelor of Engineering	**Branch:**	CE
Year:	4th Year	**Semester:**	8
Course title:	Programming with XML & JSON	**Course code**	23040802
Course type:	Engineering Science	**Course Credit**	6

CO 1	Students are able to develop a dynamic webpage by the use of java script and DHTML.
CO 2	Students will be able to write a well formed / valid XML document. ·
CO 3	Students will be able to connect a java program to a DBMS and perform insert, update.
CO 4	Delete operations on DBMS table.
CO 5	Students will be able to write a server side java application called Servlet to catch form data

CO	**Co –PO Mapping**											
	PO- 1	**PO- 2**	**PO- 3**	**PO- 4**	**PO- 5**	**PO- 6**	**PO- 7**	**PO- 8**	**PO- 9**	**PO- 10**	**PO- 11**	**PO - 12**
CO-1	2	2	3	-	3	-	-	-	2	3	-	-
CO-2	2	2	3	2	3	-	-	-	-	2	-	-
CO-3	3	2	3	2	3	-	-	-	-	2	2	-
CO-4	3	2	3	2	3	-	-	-	-	2	2	-
CO-5	2	2	3	2	3	-	-	-	3	3	2	-

Note: High = 3, Medium = 2 and Low = 1

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF COMPUTER ENGINEERING

COURSE OUTCOME

Program:	Bachelor of Engineering	**Branch:**	CE
Year:	4th Year	**Semester:**	8
Course title:	Start-Up Project Part-2	**Course code**	12300008
Course type:	Innovation and Entrepreneurship	**Course credit:**	1.5

CO 1	Initiate a start-up in team.
CO 2	Design Financial and marketing strategies for their venture.
CO 3	Generate revenue for them and contribute to society with their problem solving product.
CO 4	Register it as any form of business.

CO	**Co –PO Mapping**											
	PO- 1	**PO- 2**	**PO- 3**	**PO- 4**	**PO- 5**	**PO- 6**	**PO- 7**	**PO- 8**	**PO- 9**	**PO-10**	**PO-11**	**PO-12**
CO- 1	3	2	3	2	-	-	-	-	-	-	-	-
CO- 2	2	2	1	1	-	-	-	-	-	-	-	-
CO- 3	2	1	3	3	-	-	-	-	-	-	-	-
CO- 4	3	2	3	2	-	-	-	-	-	-	-	-

Note: High = 3, Medium = 2 and Low = 1