DAYANANDA SAGAR COLLEGE OF ENGINEERING

An Autonomous Institute Affiliated to VTU, Belagavi Approved by AICTE ; ISO 9001:2015 Certified
Accredited by National Assessment Accreditation Council (NAAC) with 'A' grade
Shavige Malleshwara Hills, Kumaraswamy Layout, Bengaluru-560078

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
SCHEME & SYLLABUS-2018

VI SEMESTER

Sl. No	Course Code	Course Title	Teaching Department	Teaching Hours/Week			Examination			Credits
				L	T	P	CIE	SEE	Total	
1	18HS6ICEEM	Engineering Economics	CSE	3	0	0	50	50	100	3
2	18CS6DCSSW	System Software	CSE	4	0	0	50	50	100	4
3	18CS6DCCYS	Cyber Security	CSE	3	0	0	50	50	100	3
4	18CS6DCCCA	Cloud Computing Applications	CSE	3	0	0	50	50	100	3
5	18CS6DEXXX	**Department Elective- C**	CSE	3	0	0	50	50	100	3
6	18CS6IEXXX	**Institutional Elective - 1**	CSE	3	0	0	50	50	100	3
7	18CS6DCMIP	Mini Project		0	0	3	50	50	100	3
8	18CS6DLSSL	System Software & Operating System Lab with Mini-project	CSE	0	2	2	50	50	100	2
9	18CS6DLCSL	Cyber Security Lab with Applications	CSE	0	2	2	50	50	100	2
10		Internship								
Total				**19**	**04**	**04**	**450**	**450**	**900**	**26**

Mini-project	Internship
To be completed before VI semester. The examination for the same will be conducted during VI semester and accordingly credit is added. The mini-project is considered as a head of passing and is considered for the award of degree. Those, who do not take-up/complete the mini-project will be declared as failed and have to complete during subsequent examination after satisfying the internship requirements. Also, mini-project is considered for eligibility to VII semester.	All the students admitted to III year of BE/B.Tech have to undergo mandatory internship of 4 weeks during the vacations of VI and VII semesters and /or VII and VIII semesters. Examination will be conducted during VIII semester and prescribed credit are added to VIII semester. Internship is considered as a head of passing and is considered for the award of degree. Those, who do not take-up/complete the internship will be declared as failed and have to complete during subsequent examination after satisfying the internship requirements.

Institution Elective: Students can select any one of the Institution electives offered by any Department. Candidate will be offered with an Institution elective,

- If the candidate has not studied the same course during the earlier courses of the program.
- The syllabus content of Institution elective is not similar to that of Departmental core courses or professional electives.
- A similar course, under any category, is not prescribed in the higher semesters of the programme. Registration to electives shall be documented under the guidance of Programme Coordinator/ Adviser/Mentor.

INTERNET OF THINGS

Course code: 18CS6DEIOT
L: P: T: S: 3:0:0: 0
Exam Hours: 03
Total Hours: 40

Credits: 03
CIE Marks: 50
SEE Marks: 50

Course objectives:

1. To understand how internet and internet of things work.
2. To understand the constraints and opportunities of wireless and mobile networks for Internet of Things.
3. To understand and analyze various performance measurements for real-time case-studies.

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

CO1	Interpret the impact and challenges posed by IoT networks leading to different architectural models.
CO2	Appraise the role of IoT protocols for efficient network communication.
CO3	Compare and contrast the deployment of smart objects and the technologies to connect them to network.
CO4	Develop web services to access/control IoT devices
CO5	Analyze the security aspects and approaches to overcome the vulnerabilities of IoT
CO6	Analyze applications of IoT in real time scenario.

Unit	Contents of the Unit	Hours	COs
1	**Introduction to Internet of Things**: Introduction, Physical Design of IoT, Logical Design of IoT,IoT Enabling Technologies, IoT Levels & Deployment Templates. **Domain Specific IoT's :**Cities	8	CO1, CO2
2	**IoT and M2M** : Introduction, M2M, Difference between IoT and M2M, SDN and NFV for IoT, Communication Technologies, Data Enrichment, Data Consolidation Management Gateway, Ease of Designing and affordability	8	CO 1, CO2
3	**Sensors, Participatory Sensing, RFID's** Introduction, Sensor Technology, Participatory sensing, Industrial IoT& Automotive IoT, Actuators, Sensor data communication Protocols, Radio Frequency Identification Technology.	8	CO2, CO3

4	**Design Principles for Web Connectivity:** Web Communication Protocols for connected devices, Message Communication Protocols for connected devices, SOAP, REST, HTTP Restful and Web Sockets. **Internet Connectivity Principles:** Internet Connectivity, IP addressing in IOT.	8	CO3, CO4
5	**IoT Privacy, Security andDesign methodology:** Vulnerabilities, Security Requirements and threat analysis, Specification - Requirement, process, model, service, functional& operational view. **Case studies:** Smart Parking	8	CO5, CO6

Text Books:

1. David Hanes, Gonzalo Salgueiro, Patrick Grossetete, Robert Barton, Jerome Henry,"IoT Fundamentals: Networking Technologies, Protocols, and Use Cases for the Internet ofThings", 1stEdition, Pearson Education (Cisco Press Indian Reprint). (ISBN: 978-9386873743)
2. ArshdeepBahga, Vijay Madisetti, "Internet of Things – A hands-on approach", Universities Press, 2015.
3. OvidiuVermesan, Peter Friess, "Internet of Things: From Research and Innovation to Market Deployment", 1st Edition, River Publishers, 2014. (ISBN: 978-87-93102-94-1), (ISBN: 978-87-93102-95-8)52605224)

Reference Books:

1.Raj Kamal, "Internet of Things: Architecture and Design Principles", 1st Edition, McGrawHill Education, 2017. (ISBN: 978-9352605224)

SOFTWARE ARCHITECTURE AND DESIGN PATTERNS

Course code: 18CS6DESAD
L: P: T: S: 3:0: 0: 0
Exam Hours: 03
Total Hours: 40

Credits: 03
CIE Marks: 50
SEE Marks: 50

Course objectives:

1. To understand the importance of software Architecture in the software development life cycle.
2. To understand the architectural styles/patterns and how to apply the architectural styles and viewpoints in different design contexts.
3. To use design-patterns and its principles in the context of software design and development.

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

CO1	Demonstrate understanding of software architecture, architecture business cycle and related terminologies.
CO2	Specify quality attributes and select associated design strategies for their accomplishment.
CO3	Apply key architectural styles in case studies
CO4	Apply appropriate Architectural patterns.
CO5	Select and use appropriate Design patterns.
CO6	Document software architectures using appropriate views.

Unit	Contents of the Unit	Hours	COs
1.	**Overview:** The Architecture Business Cycle: Where do architectures come from? Software processes and the architecture business cycle; Other points of view; Architectural patterns, Design Patterns, reference models and reference architectures; Importance of software architecture; Architectural structures and views. **:** What is a pattern and what makes a pattern? How to use a Design Pattern? Pattern categories; Relationships between patterns	8	CO 1

2.	**Architectural styles and case studies:** Architectural styles; Pipes and filters; Data abstraction and object-oriented organization; Event-based, implicit invocation; Layered systems; Repositories; Interpreters; Process control; Other familiar architectures; Heterogeneous architectures. Case Studies: Keyword in Context; Instrumentation software; Mobile robotics; Cruise control;	8	CO 3
3.	**Software Quality Attributes and Tactics:** Functionality and architecture; Architecture and key quality attributes; System quality attributes; Business qualities; Architecture qualities Quality attribute scenarios in practice; Achieving Quality: **Introducing tactics**: Availability tactics; Modifiability tactics; Performance tactics; Security tactics; Testability tactics; Usability tactics; Relationship of tactics to arch. Patterns and styles.	8	CO 2
4.	**Architectural Patterns**: Distributed Systems-Broker; Interactive Systems-Model-View-Controller **Design Patterns:** Structural decomposition, Whole-part; Organization of work, Master-Slave; Access Control: Proxy.	8	CO 4 CO 5
5.	**Designing and Documenting Software Architecture:** Architecture in the life cycle; Designing the architecture; Forming the team structure; creating a skeletal system. Uses of architectural documentation; Views; Choosing the relevant views; Documenting a view; Documentation across views.	8	CO 6

Text Books:

1. Software Architecture in Practice, Len Bass, Paul Clements, Rick Kazman, 2nd Edition, Pearson Education, 2003.
2. Software Architecture- Perspectives on an Emerging Discipline, Mary Shaw and David Garlan, Prentice-Hall of India, 2007.
3. Pattern-Oriented Software Architecture, A System of Patterns - Volume 1 –Frank Buschmann, RegineMeunier, Hans Rohnert, Peter Sommerlad, Michael Stal, John Wiley and Sons, 2006.

Reference Books:

1. Design Patterns- Elements of Reusable Object-Oriented Software, E. Gamma, R. Helm, R. Johnson, J. Vlissides, Addison-Wesley, 1995.