



REGISTRAR

REF: VTU/BGM/21CB72/644/2024-25/ 3696

DATE: 29 OCT 2024

**CIRCULAR**

**Subject:** Correction of SEE method for course 21CB72 -Internet of Things regarding...

**Reference:**

1. Chairperson email dated: 21.10.2024
2. The Hon'ble Vice-Chancellor's approval Dated: 25.10.2024

Sir/ Madam,

This is with reference to the subject mentioned above. A typographical error in the Semester End Examination (SEE) of the course **21CB72 - Internet of Things** has been corrected as per the suggestions from the Board of Studies. A copy of the revised syllabus is attached with this circular for stakeholders' reference.

All principals of engineering colleges under the university are requested to bring this updated circular to the attention of all concerned students and teachers.

Sd/-  
Registrar

To,

**The Principals of all engineering colleges under the ambit of the university.**

Copy to:

- The Registrar(Evaluation) VTU Belagavi for information and needful
- The Chairperson and Members Board of Studies in ECE/ETC VTU Belagavi for information
- The Chairperson and Members Board of Examiners VTU Belagavi for information and needful
- The Director(I/c) ITI SMU VTU Belagavi for information and to upload the circular on VTU web portal.
- The Special Officer QPDS for information and needful
- Special Officers of the academic for information
- Office Copy

  
REGISTRAR  
29.10.24  


<b>INTERNET OF THINGS</b>			
Course Code	21CB72	CIE Marks	50
Teaching Hours/Week(L:T:P:S)	2:0:0:0	SEE Marks	50
Total Hours of Pedagogy	40	Total Marks	100
Credits	02	Exam Hours	02
<b>Course Learning Objectives:</b>			
CLO 1. Assess the genesis and impact of IoT applications, architecture in real world.			
CLO 2. Compare different Application protocols for IoT.			
CLO 3. Infer the role of Data Analytics and Security in IoT.			
CLO 4. Analysis the IoT in business			
CLO 5. Understand the application of IoT indifferent areas.			
<b>Teaching-Learning Process (General Instructions)</b>			
These are sample Strategies, which teacher scan use to accelerate the attainment of the various course out comes.			
<ul style="list-style-type: none"> <li>• Lecturer method (L) does not mean only traditional lecture method, but different type of teaching methods may be adopted to develop the outcomes.</li> <li>• Show Video/animation films to explain functioning of various concepts.</li> <li>• Encourage collaborative (Group Learning) Learning in the class.</li> <li>• Ask at least three HOT (Higher order Thinking) questions in the class, which promotes critical thinking.</li> <li>• Adopt Problem Based Learning (PBL), which fosters students' Analytical skills, develop thinking skills such as the ability to evaluate, generalize, and analyze information rather than simply recall it.</li> <li>• Topics will be introduced in a multiple representation.</li> <li>• Show the different ways to solve the same problem and encourage the students to come up with their own creative ways to solve them.</li> <li>• Discuss how every concept can be applied to the real world-and when that's possible, it helps improve the students' understanding.</li> </ul>			
<b>Module-1</b>			
What is IoT, Genesis of IoT, IoT and Digitization, IoT Impact, Convergence of IT and IoT, IoT Challenges, IoT Network Architecture and Design, Drivers Behind New Network Architectures, Comparing IoT Architectures, A Simplified IoT Architecture, The Core IoT Functional Stack, IoT			

Data Management and Compute Stack.	
Textbook1:Ch.1,2 RBT:L1,L2,L3	
Teaching-Learning Process	Chalk and board, Active Learning
<b>Module-2</b>	
IP as the IoT Network Layer, The Business Case for IP, The need for Optimization, Optimizing IP for IoT, Profiles and Compliances, Application Protocols for IoT, The Transport Layer, IoT Application Transport Methods.	
Textbook1:Ch.5,6RBT:L1,L2,L3	
Teaching-Learning Process	Chalk and board, Active Learning
<b>Module-3</b>	
Data and Analytics for IoT, An Introduction to Data Analytics for IoT, Machine Learning, Big Data Analytics Tools and Technology, Edge Streaming Analytics, Network Analytics, Securing IoT, A Brief History of OT Security, Common Challenges in OT Security, How IT and OT Security Practices and Systems Vary, Formal Risk Analysis Structures: OCTAVE and FAIR, The Phased Application of Security in an Operational Environment	
Textbook1:Ch.7,8 RBT:L1,L2,L3	
Teaching-Learning Process	Chalk and board, Demonstration
<b>Module-4</b>	
IoT in Industry An introduction to connected Manufacturing, An architecture fro the connected factory, industrial automation control protocols, connected factory security, IoT and M2M Introduction, M2M, Difference between IoT and M2M, SDN and NFV for IoT Textbook:1Ch.9 Textbook2:Ch.3	
Teaching-Learning Process	Chalk and board
<b>Module-5</b>	
Home Automation smart Lighting, Smart Appliances ,Intrusion Detection, Smoke/Gas detectors, Cities: Smart Parking, Smart Lighting, Smart Roads, Structure Health Monitoring, Surveillance, Emergency response Environment Weather Monitoring Air Pollution Monitoring Noise Pollution Monitoring Forest Fire Detection River Floods detection, Energy Smart grids, Renewable Energy systems, Prognostics Retail Inventory Management ,Smart Payments, Smart Vending Machines Logistics, Route Generation and Scheduling Fleet Tracking Shipment Monitoring, remote Vehicle Diagnostics Agriculture Smart Irrigation Green House Control Industry machine Diagnosis and Prognosis Indoor air Quality Monitoring Health and Lifestyle Health and Fitness Monitoring Wear able Electronics Textbook2:Ch.2	
Teaching-Learning Process	Chalk and board



**Course outcome(Course Skill Set)**

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

- CO1. Interpret the impact and challenges posed by IoT net works leading to new architectural models.
- CO2. Appraise the role of IoT protocols for efficient network communication.
- CO3. Elaborate the need for Data Analytics and Security in IoT.
- CO4. Model the Internet of things to business
- CO5. Understand the practical knowledge through different case studies

**Assessment Details (both CIE and SEE)**

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 35% ( 18 Marks out of 50) in the semester-end examination(SEE), and a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together

**Continuous Internal Evaluation:**

1. Three Unit Tests each of **20 Marks (duration 01 hour)**
2. First test at the end of 5<sup>th</sup> week of the semester
3. Second test at the end of the 10<sup>th</sup> week of the semester
4. Third test at the end of the 15<sup>th</sup> week of the semester

Two assignments each of **10 Marks**

1. First assignment at the end of 4<sup>th</sup> week of the semester
2. Second assignment at the end of 9<sup>th</sup> week of the semester

Group discussion/Seminar/quiz any one of three suitably planned to attain the COs and POs for **20 Marks (duration 01 hours)**

At the end of the 13<sup>th</sup> week of the semester

The sum of three tests, two assignments, and quiz/seminar/group discussion will be out of 100 marks and will be **scaled down to 50 marks**

(to have less stressed CIE, the portion of the syllabus should not be common /repeated for any of the methods of the CIE. Each method of CIE should have a different syllabus portion of the course).

**CIE methods /question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.**

**Semester End Examination:**

- Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for the subject (**duration 03 hours**)
- The question paper will have ten questions. Each question is set for 20 marks. Marks scored shall be proportionally reduced to 50 marks
- There will be 2 questions from each module. Each of the two questions under a module (with a

maximum of 3 sub-questions), **should have a mix of topics** under that module.

- The students have to answer 5 full questions, selecting one full question from each module

**Suggested Learning Resources:**

**Textbooks**

- David Hanes, Gonzalo Salgueiro, Patrick Grossetete, Robert Barton, Jerome Henry, "IoT Fundamentals :Networking Technologies, Protocols, and Use Cases for the Internet of Things", Pearson Education (Cisco Press Indian Reprint),1<sup>st</sup> Edition, ISBN:978-9386873743.
- Vijay Madiseti and Arshdeep Bahga,"Internet of Things (A Hands-on Approach)",Universities Press, 1stEdition.

**Reference Books**

1. Srinivasa K G, "Internet of Things", CENGAGE Leaning India, 2017.
2. RajKamal,"Internet of Things: Architecture and Design Principles", McGraw Hill Education, 1<sup>st</sup> Edition, ISBN:978- 9352605224.

