

VAC083	INTERNET OF THINGS (IoT)
Contact Hours	30 Hours
Prerequisite	Nil

Course Description

This course on Internet of Things (IoT) is designed to provide students with a comprehensive understanding of IoT technologies, applications, and best practices. Students will explore the fundamentals of IoT architecture, data collection and analysis, security, and real-world IoT implementations. The course aims to equip individuals with the knowledge and skills needed to design, implement, and manage IoT solutions in various domains.

Course Objectives

The course will enable the students to:

- Understand the core principles and components of IoT.
- Explore IoT communication protocols and data collection techniques.
- Learn about IoT security, privacy, and ethical considerations.
- Develop skills for designing and implementing IoT applications.
- Gain proficiency in data analysis and visualization for IoT.

Course Outcomes

On the completion of the course students will be able to:

CO1: Explain the core principles and components of IoT.

CO2: Address IoT security, privacy, and ethical concerns.

CO3: Address IoT security, privacy, and ethical concerns.

CO4: Design and implement IoT applications in various domains.

Course Content

Module 1: Introduction to Internet of Things

5 hours

- The Significance of IoT in Modern Society
- Ethical Considerations in IoT
- Challenges and Opportunities in IoT
- Real-world IoT Success Stories

Module 2: IoT Architecture and Components

5 hours

- IoT Architecture Overview
- Sensors and Actuators
- Communication Protocols in IoT
- IoT Edge and Cloud Computing

Module 3: Data Collection and Analysis

5 hours

- Data Collection Methods and Devices
- Data Transmission and Storage
- Data Analysis Techniques for IoT
- Real-time Data Visualization

Module 4: IoT Security, Privacy, and Ethics

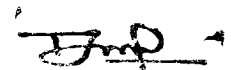
5 hours

- IoT Security Challenges and Best Practices
- Privacy Concerns and Data Protection
- Ethical Considerations in IoT Design
- Legal and Regulatory Frameworks for IoT

Module 5: Designing and Implementing IoT Applications

5 hours

- IoT Application Development Platforms
- Prototyping and Rapid Development
- Case Studies and Best Practices
- Hands-on IoT Application Design



Module 6: IoT in Action

5 hours

- IoT in Healthcare and Wearables
- Smart Cities and Urban IoT
- Industrial IoT and Industry 4.0
- IoT in Agriculture and Environmental Monitoring

Practicum

The course includes a practicum where students will design and prototype IoT projects, collect and analyze IoT data, implement security and privacy measures, and present their final IoT projects.

Textbooks

Sheth, A. P., & Cabezas, A. L. (2019). Internet of Things: Architectures, Protocols, and Standards. CRC Press.

Reference Books

Gubbi, J., Buyya, R., Marusic, S., & Palaniswami, M. (2013). Internet of Things (IoT): A Vision, Architectural Elements, and Future Directions. Future Generation Computer Systems, 29(7), 1645-1660.

Hall, R. L. (2018). Internet of Things in Business: Programming and Practices. Wiley.

Lin, J., Yu, W., Zhang, N., Yang, X., Zhang, H., & Zhao, W. (2017). A Comprehensive Introduction to Different Categories of IoT. In Internet of Things (pp. 3-25). Springer.

Ray, P. P. (2016). Internet of Things: A Hands-On Approach. Springer.

Vermesan, O., & Friess, P. (Eds.). (2016). Internet of Things: From Research and Innovation to Market Deployment. River Publishers.

	Evaluation Component	Weightage (%)
1	Activities	20
2	Project/Presentation	20
3	Attendance	10
4	End Term Examination	50





K.R. MANGALAM UNIVERSITY
EDUCATION FOR LIFE
(Recognized by UGC and a member of AIU)

Ref.No.:KRMU/Admin./Notice/2021-2022/ 2433(A) Dated: 02nd August, 2021

NOTICE

This is to put for information that School of Engineering & Technology is offering Value-Added Course (VAC) for all interested students during Odd Semester as per the following specifications.

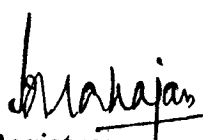
Course Code	Course Title	Coordinating Department / School	Duration
VAC069	Innovation through Design Thinking	SOET	30 Hrs.
VAC072	Applied Cryptography	SOET	30 Hrs.
VAC073	Data Analytics with R	SOET	30 Hrs.
VAC082	ORACLE	SOET	30 Hrs.
VAC083	Internet of Things (IoT)	SOET	30 Hrs.

Maximum 100 seats are available for the course.

Course Start Date: 08 September 2021

Course End Date: 29 September 2021

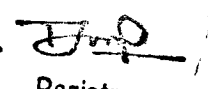
All interested students are required to confirm their registration with the Dean-School of Engineering & Technology latest by **24th August, 2021.**


Registrar
K.R. Mangalam University

Copy to: Sohna Road, Gurugram (Haryana)

- Vice Chancellor
- Dean (Academics Affairs)
- Controller of Examinations
- All Deans/ School Coordinators
- All Faculty Members/ Mentors
- Notice Board
- Office Copy

: For kind information


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K.R. Mangalam University
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ATTENDANCE SHEET

VAC COURSE FOR ACADEMIC YEAR 2021-22

COURSE CODE: VAC083

COURSE TITLE: INTERNET OF THINGS (IoT)

ROLL NO	NAME	PROGRAMME	SEMESTER	8-Sep-21	10-Sep-21	17-Sep-21	22-Sep-21	29-Sep-21	3-Oct-21	5-Oct-21
2102070018	TANISHA SINGLA	B.Com (H)	Semester I	P	P	P	P	P	P	P
2102070017	NAINA GARG	B.Com (H)	Semester I	A	P	P	A	P	P	P
2102070017	NAINA GARG	B.Com (H)	Semester I	P	P	P	P	P	P	P
2102070028	RASHMI MISHRA	B.Com (H)	Semester I	P	P	P	P	P	P	P
2102070027	MUSKAN SHARMA	B.Com (H)	Semester I	A	P	P	P	P	P	P
2102070027	MUSKAN SHARMA	B.Sc (H) Math	Semester I	P	P	A	P	P	P	A
2103110001	ROUNAK KUMAR	B.Sc (H) Math	Semester I	P	P	P	P	P	P	P
2103110004	AMRIT AGARWAL	B.Sc. (H) Agriculture	Semester I	P	P	A	P	P	P	P
2103110004	AMRIT AGARWAL	B.Sc. (H) Agriculture	Semester I	P	P	A	P	P	P	P
2113820006	JYOTI RAWAT	B.Sc (H) Math	Semester I	P	P	P	P	P	P	P
2103110007	CHANDAN	B.Sc. (H) Agriculture	Semester I	P	A	P	P	A	P	P
2103110007	CHANDAN	B.Sc. (H) Agriculture	Semester I	P	A	P	P	A	P	P
2113820005	DIKSHA MISHRA	B.Sc. (H) CS	Semester I	P	P	A	P	P	P	P
2113820005	DIKSHA MISHRA	B.Sc. (H) CS	Semester I	P	P	A	P	P	P	P
2101720008	DEEPAK JAIN	B.Sc. (H) CS	Semester I	P	A	P	P	P	P	P
2101720007	SONU KUMAR	B.Sc. (H) CS	Semester I	P	A	P	P	P	P	P
2101720007	SONU KUMAR	B.Sc. (H) CS	Semester I	P	A	P	P	P	P	P
2101720006	DEV CHAUDHARY	B.Sc. (H) CS	Semester I	A	P	A	P	P	P	A
2101720005	ROJALIN MAHAPATRO	B.Sc. (H) CS	Semester I	P	P	A	P	P	P	P
2101720004	TARANG BALANI	B.Sc. (H) CS	Semester I	P	P	P	P	P	P	P
2101720003	HARSHI GUPTA	B.Sc. (H) CS	Semester I	P	P	P	P	P	P	P
2101720002	JAHID HUSSAIN	B.Sc. (H) CS	Semester I	P	P	P	P	P	P	P
2101720001	HARSH	B.Sc. (H) CS	Semester I	P	P	P	P	P	P	P

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Registrar

K.R. Mangalam University
Sohna Road, Gurugram, (Haryana)

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School of Engineering & Technology
K.R. Mangalam University
Gurgaon, Haryana
DEAN

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ATTENDANCE SHEET

VAC COURSE FOR ACADEMIC YEAR 2021-22

COURSE CODE: VAC083

COURSE TITLE: INTERNET OF THINGS (IoT)

ROLL NO	NAME	10-Oct-21	12-Oct-21	17-Oct-21	19-Oct-21	24-Oct-21	26-Oct-21	1-Nov-21	3-Nov-21	5-Nov-21
2102070018	TANISHA SINGLA	P	P	P	P	P	P	P	P	P
2102070017	NAINA GARG	A	P	P	P	P	P	P	A	P
2102070028	RASHMI MISHRA	P	P	P	P	P	P	P	P	P
2102070027	MUSKAN SHARMA	P	P	P	P	P	A	P	P	A
2103110001	ROUNAK KUMAR	P	A	P	P	P	A	P	P	P
2103110004	AMRIT AGARWAL	P	P	P	P	P	P	P	P	A
2113820006	JYOTI RAWAT	A	P	P	P	P	A	P	P	P
2103110007	CHANDAN	P	P	P	P	P	P	P	P	A
2113820005	DIKSHA MISHRA	A	P	P	A	P	P	P	P	P
2101720008	DEEPAK JAIN	P	P	P	A	P	P	A	P	P
2101720007	SONU KUMAR	P	P	P	P	P	P	P	P	P
2101720006	DEV CHAUDHARY	P	P	P	P	P	P	P	P	P
2101720005	ROJALIN MAHAPATRO	P	P	P	P	P	P	P	P	P
2101720004	TARANG BALANI	P	P	P	P	P	P	A	P	P
2101720003	HARSHI GUPTA	A	P	A	P	P	P	P	P	P
2101720002	JAHAID HUSSAIN	P	P	P	P	P	P	P	P	A
2101720001	HARSH	A	P	P	A	P	P	P	P	P

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COURSE INCHARGE

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Sohna Road, Gurugram, (Haryana)

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School of Engineering & Technology (SOE)
K.R. Mangalam University
Sector Road, Gurugram
122002
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ATTENDANCE SHEET

VAC COURSE FOR ACADEMIC YEAR 2021-22

COURSE CODE: VAC083

COURSE TITLE: INTERNET OF THINGS (IoT)

ROLL NO	NAME	10-Nov-21	12-Nov-21	17-Nov-21	21-Nov-21	24-Nov-21	26-Nov-21	1-Dec-21	3-Dec-21	8-Dec-21
2102070018	TANISHA SINGLA	P	P	P	P	P	P	P	A	A
2102070017	NAINA GARG	A	P	P	P	P	P	P	P	P
2102070028	RASHMI MISHRA	P	P	P	P	P	P	A	A	P
2102070027	MUSKAN SHARMA	P	P	P	A	P	P	P	P	P
2103110001	ROUNAK KUMAR	P	P	P	A	A	P	P	P	P
2103110004	AMRIT AGARWAL	P	P	P	P	P	A	P	P	P
2113820006	JYOTI RAWAT	P	A	P	P	P	P	A	P	P
2103110007	CHANDAN	P	P	P	P	P	A	A	P	A
2113820005	DIKSHA MISHRA	P	P	P	P	A	P	P	P	P
2101720008	DEEPAK JAIN	P	P	P	P	P	P	A	P	P
2101720007	SONU KUMAR	P	A	P	P	P	P	P	P	P
2101720006	DEV CHAUDHARY	P	A	P	P	P	P	A	P	P
2101720005	ROJALIN MAHAPATRO	P	P	P	P	P	P	P	P	P
2101720004	TARANG BALANI	P	P	P	P	P	P	A	A	P
2101720003	HARSHI GUPTA	P	P	A	P	P	P	P	P	A
2101720002	JAHID HUSSAIN	P	P	P	P	P	A	P	P	P
2101720001	HARSH	P	P	P	P	A	P	P	P	P

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VAC COURSE FOR ACADEMIC YEAR 2021-22

COURSE CODE: VAC083

COURSE TITLE: INTERNET OF THINGS (IoT)

ROLL NO	NAME	10-Dec-21	15-Dec-21	17-Dec-21	22-Dec-21	24-Dec-21	29-Dec-21	Total	Present	Percentage
2102070018	TANISHA SINGLA	P	P	A	P	P	A	31	27	87.10
2102070017	NAINA GARG	A	P	P	A	P	P	31	24	77.42
2102070028	RASHMI MISHRA	P	P	P	P	A	A	31	26	83.87
2102070027	MUSKAN SHARMA	A	P	P	P	A	P	31	24	77.42
2103110001	ROUNAK KUMAR	P	P	P	P	A	P	31	25	80.65
2103110004	AMRIT AGARWAL	P	P	P	P	A	P	31	27	87.10
2113820006	JYOTI RAWAT	P	P	P	A	P	P	31	25	80.65
2103110007	CHANDAN	P	A	P	P	P	P	31	25	80.65
2113820005	DIKSHA MISHRA	A	P	P	P	P	P	31	27	87.10
2101720008	DEEPAK JAIN	P	P	P	P	P	P	31	26	83.87
2101720007	SONU KUMAR	A	P	P	P	A	A	31	26	83.87
2101720006	DEV CHAUDHARY	A	P	P	P	P	P	31	26	83.87
2101720005	ROJALIN MAHAPATRO	P	A	P	A	A	P	31	27	87.10
2101720004	TARANG BALANI	A	A	P	P	P	P	31	25	80.65
2101720003	HARSHI GUPTA	P	P	A	P	P	A	31	24	77.42
2101720002	JAHAID HUSSAIN	A	A	P	A	P	P	31	26	83.87
2101720001	HARSH	P	P	P	P	A	A	31	26	83.87

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VALUE ADDED COURSE(VAC)

ACADEMIC YEAR 2021-22

COURSE CODE: VAC083

COURSE TITLE: INTERNET OF THINGS (IoT)

COURSE OFFERED BY: SCHOOL OF ENGINEERING AND TECHNOLOGY (SOET)

LIST OF STUDENTS COMPLETING THE COURSE

S.NO	SESSION	ROLL NO	NAME	PROGRAMME	SEMESTER	COURSE CODE	COURSE TITLE	SCHOOL
1	2022-23	2102070018	TANISHA SINGLA	B.Com (H)	Semester I	VAC083	INTERNET OF THINGS (IoT)	SCHOOL OF MANAGEMENT & COMMERCE(SOMC)
2	2022-23	2102070017	NAINA GARG	B.Com (H)	Semester I	VAC083	INTERNET OF THINGS (IoT)	SCHOOL OF MANAGEMENT & COMMERCE(SOMC)
3	2022-23	2102070028	RASHMI MISHRA	B.Com (H)	Semester I	VAC083	INTERNET OF THINGS (IoT)	SCHOOL OF MANAGEMENT & COMMERCE(SOMC)
4	2022-23	2102070027	MUSKAN SHARMA	B.Com (H)	Semester I	VAC083	INTERNET OF THINGS (IoT)	SCHOOL OF MANAGEMENT & COMMERCE(SOMC)
5	2022-23	2103110001	ROUNAK KUMAR	B.Sc (H) Math	Semester I	VAC083	INTERNET OF THINGS (IoT)	SCHOOL OF BASIC & APPLIED SCIENCE(SBAS)
6	2022-23	2103110004	AMRIT AGARWAL	B.Sc (H) Math	Semester I	VAC083	INTERNET OF THINGS (IoT)	SCHOOL OF BASIC & APPLIED SCIENCE(SBAS)
7	2022-23	2113820006	JYOTI RAWAT	B.Sc. (H) Agriculture	Semester I	VAC083	INTERNET OF THINGS (IoT)	SCHOOL OF ARCHITECTURE & DESIGN(SOAD)
8	2022-23	2103110007	CHANDAN	B.Sc (H) Math	Semester I	VAC083	INTERNET OF THINGS (IoT)	SCHOOL OF BASIC & APPLIED SCIENCE(SBAS)
9	2022-23	2113820005	DIKSHA MISHRA	B.Sc. (H) Agriculture	Semester I	VAC083	INTERNET OF THINGS (IoT)	SCHOOL OF ARCHITECTURE & DESIGN(SOAD)
10	2022-23	2101720008	DEEPAK JAIN	B.Sc. (H) CS	Semester I	VAC083	INTERNET OF THINGS (IoT)	SCHOOL OF ENGINEERING & TECHNOLOGY (SOET)
11	2022-23	2101720007	SONU KUMAR	B.Sc. (H) CS	Semester I	VAC083	INTERNET OF THINGS (IoT)	SCHOOL OF ENGINEERING & TECHNOLOGY (SOET)
12	2022-23	2101720006	DEV CHAUDHARY	B.Sc. (H) CS	Semester I	VAC083	INTERNET OF THINGS (IoT)	SCHOOL OF ENGINEERING & TECHNOLOGY (SOET)
13	2022-23	2101720005	ROJALIN MAHAPATRO	B.Sc. (H) CS	Semester I	VAC083	INTERNET OF THINGS (IoT)	SCHOOL OF ENGINEERING & TECHNOLOGY (SOET)
14	2022-23	2101720004	TARANG BALANI	B.Sc. (H) CS	Semester I	VAC083	INTERNET OF THINGS (IoT)	SCHOOL OF ENGINEERING & TECHNOLOGY (SOET)
15	2022-23	2101720003	HARSHI GUPTA	B.Sc. (H) CS	Semester I	VAC083	INTERNET OF THINGS (IoT)	SCHOOL OF ENGINEERING & TECHNOLOGY (SOET)
16	2022-23	2101720002	JAHID HUSSAIN	B.Sc. (H) CS	Semester I	VAC083	INTERNET OF THINGS (IoT)	SCHOOL OF ENGINEERING & TECHNOLOGY (SOET)
17	2022-23	2101720001	HARSH	B.Sc. (H) CS	Semester I	VAC083	INTERNET OF THINGS (IoT)	SCHOOL OF ENGINEERING & TECHNOLOGY (SOET)

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This is to certify that **TANISHA SINGLA**, University Enrolment No **2102070018** of **B.Com (H)** programme has successfully qualified **VALUE ADDED COURSE VAC083 (Internet of Things (IoT))** during Academic Session **2021-22 (Odd Semester)**.

Date: 21.02.2022

hahajan

Controller of Examination

Jaf

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K.R. Mangalam University
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This is to certify that **NAINA GARG**, University Enrolment No **2102070017** of **B.Com (H)** programme has successfully qualified **VALUE ADDED COURSE VAC083 (Internet of Things (IoT))** during Academic Session **2021-22 (Odd Semester)**.

Date: 21.02.2022

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This is to certify that **RASHMI MISHRA**, University Enrolment No **2102070028** of **B.Com (H)** programme has successfully qualified **VALUE ADDED COURSE VAC083 (Internet of Things (IoT))** during Academic Session **2021-22 (Odd Semester)**.

Date: 21.02.2022

h. rajan

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This is to certify that **MUSKAN SHARMA**, University Enrolment No **2102070027** of **B.Com (H)** programme has successfully qualified **VALUE ADDED COURSE VAC083** (Internet of Things (IoT)) during Academic Session **2021-22** (Odd Semester).

Date: 21.02.2022

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This is to certify that **ROUNAK KUMAR**, University Enrolment No **2103110001** of **B.Sc (H) Math** programme has successfully qualified **VALUE ADDED COURSE VAC083 (Internet of Things (IoT))** during Academic Session **2021-22 (Odd Semester)**.

Date: 21.02.2022

brahajan

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This is to certify that **AMRIT AGARWAL**, University Enrolment No **2103110004** of **B.Sc (H) Math** programme has successfully qualified **VALUE ADDED COURSE VAC083 (Internet of Things (IoT))** during Academic Session **2021-22 (Odd Semester)**.

Date: 21.02.2022

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Controller of Examination

Prof

Registrar
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Sohna Road, Gurugram, (Haryana)



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This is to certify that **JYOTI RAWAT**, University Enrolment No **2113820006** of **B.Sc. (H) Agriculture** programme has successfully qualified **VALUE ADDED COURSE VAC083** (Internet of Things (IoT)) during Academic Session **2021-22** (Odd Semester).

Date: 21.02.2022

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This is to certify that **CHANDAN**, University Enrolment No **2103110007** of **B.Sc (H) Math** programme has successfully qualified **VALUE ADDED COURSE VAC083 (Internet of Things (IoT))** during Academic Session **2021-22 (Odd Semester)**.

Date: 21.02.2022

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This is to certify that **DIKSHA MISHRA**, University Enrolment No **2113820005** of **B.Sc. (H) Agriculture** programme has successfully qualified **VALUE ADDED COURSE VAC083 (Internet of Things (IoT))** during Academic Session **2021-22 (Odd Semester)**.

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Date: 21.02.2022

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CERTIFICATE OF COMPLETION

This is to certify that **DEEPAK JAIN**, University Enrolment No **2101720008** of **B.Sc. (H) CS** programme has successfully qualified **VALUE ADDED COURSE VAC083 (Internet of Things (IoT))** during Academic Session **2021-22 (Odd Semester)**.

Date: 21.02.2022

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K. R. Mangalam University,
Sohna Road, Gurugram, (Haryana)



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CERTIFICATE OF COMPLETION

This is to certify that **SONU KUMAR**, University Enrolment No **2101720007** of **B.Sc. (H) CS** programme has successfully qualified **VALUE ADDED COURSE VAC083 (Internet of Things (IoT))** during Academic Session **2021-22 (Odd Semester)**.

Date: 21.02.2022

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This is to certify that **DEV CHAUDHARY**, University Enrolment No **2101720006** of **B.Sc. (H) CS** programme has successfully qualified **VALUE ADDED COURSE VAC083 (Internet of Things (IoT))** during Academic Session **2021-22 (Odd Semester)**.

Date: 21.02.2022

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This is to certify that **ROJALIN MAHAPATRO**, University Enrolment No **2101720005** of **B.Sc. (H) CS** programme has successfully qualified **VALUE ADDED COURSE VAC083** (Internet of Things (IoT)) during Academic Session **2021-22** (Odd Semester).

Date: 21.02.2022

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Controller of Examination

Registrar

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This is to certify that **HARSHI GUPTA**, University Enrolment No **2101720003** of **B.Sc. (H) CS** programme has successfully qualified **VALUE ADDED COURSE VAC083 (Internet of Things (IoT))** during Academic Session **2021-22 (Odd Semester)**.

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This is to certify that **JAHID HUSSAIN**, University Enrolment No **2101720002** of **B.Sc. (H) CS** programme has successfully qualified **VALUE ADDED COURSE VAC083 (Internet of Things (IoT))** during Academic Session **2021-22 (Odd Semester)**.

Date: 21.02.2022

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This is to certify that **HARSH**, University Enrolment No **2101720001** of **B.Sc. (H) CS** programme has successfully qualified **VALUE ADDED COURSE VAC083 (Internet of Things (IoT))** during Academic Session **2021-22 (Odd Semester)**.

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