

Hindustan College of Science and Technology

Farah (Mathura)

Department of Information Technology

Date: 29 March 2022

Circular

Registration for Value-Added Course: "Problem Solving using C and C++ (VACIT-001)"

Dear Students,

We are pleased to announce a value-added course on "Problem Solving using C and C++" scheduled to take place from 11 April 2022 to 26 June 2022 for 2nd year students. This course aims to equip you with essential problem-solving skills using the C and C++ programming languages, which are fundamental to your academic and professional growth in the field of Information Technology.

Course Details:

Course Name: Problem Solving using C and C++

Course Duration: 11 April 2022 to 26 June 2022 (30 Hrs)

Last Date of Registration: 10 April 2022

Registration:

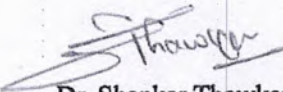
To participate in this valuable opportunity, interested students must register themselves by 10 April 2022. To register, kindly contact Mr. Ajay Raj Parashar, Assistant Professor in the Department of Information Technology. Mr. Parashar will guide you through the registration process and address any queries you may have.

Please note that this course is mandatory for all the students of 2nd year IT Department. As, this value-added course presents a unique opportunity for you to enhance your programming skills and stand out in the highly competitive IT industry.

For any further information or clarification, please feel free to contact the undersigned.

Thank you.

Sincerely,


Dr. Shankar Thawkar

HOD, IT

Head

Department of Information Technology

Hindustan College of Science & Technology

Farah, Mathura

Copy to:

1. Director office for kind information
2. All Deans
3. All HODs – for circulation among all concerned
4. Office Copy


Director
Hindustan College of
Science & Technology
FARAH (MATHURA)

VISION OF THE DEPARTMENT

Information Technology undergraduate program empowers students with research and training-based education to become global technical leaders and entrepreneurs, creating positive societal impact.

MISSION OF THE DEPARTMENT

- Foster innovation, research, and entrepreneurship through real-world projects and industry collaborations.
- Develop ethical global leaders with theoretical and practical education, critical thinking, and social responsibility.
- Provide outcome-based education for holistic development, integrating technical skills with leadership and teamwork.



HINDUSTAN COLLEGE OF SCIENCE AND TECHNOLOGY MATHURA

INVITES YOU FOR A
VALUE ADDED COURSE
ON

**PROBLEM SOLVING USING C AND C++
(VACIT-001)**

11th April 2022 - 26th June 2022

(Session: 2021 - 2022)

Registration Date: 08 April 2022 - 10 April 2022

For Registration, Please contact:

Mr. Ajay Raj Parashar
Assistant Professor, IT

Head
Department of Information Technology
Hindustan College of Science & Technology
Farah, Mathura

DEPARTMENT OF INFORMATION TECHNOLOGY

www.hcst.edu.in

Director
Hindustan College of
Science & Technology
FARAH (MATHURA).

ABOUT

THE DEPARTMENT

Department of Information Technology was established in the year 1999 with an objective of imparting quality education in the field of Information Technology. Department of IT was accredited by National board of Accreditation (NBA) in 2006.

The department is located in a sprawling environment with a highly qualified and experienced faculty. The department works with the objective of addressing critical challenges faced by the Industry, society and the academia. Perhaps even more important is our unceasing commitment to our students, helping them to learn, grow, develop, and achieve their goals in their pursuit to excel in their professional career.

The department also have a student association QuBIT that provides a platform to future engineers to learn new technological innovations and also provide industry exposure to the students, by organizing workshops, seminars & other events.

ABOUT

THE PROGRAM

This program is designed to provide a comprehensive overview of C/C++ programming. The syllabus covers a range of topics including functions, arrays and pointers, secure coding practices, exception handling and assertions, disk files and I/O, and generic programming with templates. Through practical exercises and problem sets, students will develop the skills to write efficient and secure code in C/C++. The course also covers the dynamic memory allocation model and the use of smart pointers to mitigate common memory pitfalls. In addition, students will have the opportunity to work with the Standard Template Library and understand its various components such as containers, iterators, and algorithms. This program provides a comprehensive learning experience for anyone looking to enhance their C/C++ programming skills. By the end of the program, students will be well-equipped to tackle complex coding projects and have a deep understanding of how to write efficient and secure code in C/C++.

Objectives

1. To provide a comprehensive overview of C/C++ programming and its various components.
2. To equip students with the skills to write efficient and secure code through the use of functions, arrays and pointers, and secure coding practices.
3. To teach students how to handle errors and exceptions in their code, and implement proper error handling and assertions.
4. To introduce students to the dynamic memory allocation model, including smart pointers and common memory pitfalls.
5. To help students understand and utilize the Standard Template Library and its various components, including containers, iterators, algorithms, and customizing and extending the STL. Allowing them to perform real-world data analysis and extract insights.

COURSE

OUTCOMES

CO-1:

Understand functions and write efficient, secure code in C/C++.

CO-2:

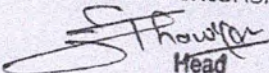
Analyze and use arrays, pointers, dynamic memory allocation, and type inference.

CO-3:

Identify and prevent common string and integer errors using secure coding practices.

CO-4:

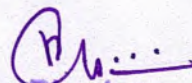
Implement error handling, assertions, exceptions, stack unwinding, disk files, I/O streams, and the standard template library (STL), including customization and extension


Head

Department of Information Technology
Hindustan College of Science & Technology
Farah, Mathura

DEPARTMENT OF INFORMATION TECHNOLOGY

www.hcst.edu.in


Director

Hindustan College of
Science & Technology
FARAH (MATHURA)

CO-PO-PSO MAPPING

Problem Solving using C and C++ (VACIT-001)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO-1	3	3	2	2	-	3	-	3	2	-	-	2	2	3	-
CO-2	2	3	3	3	-	1	-	2	2	-	-	2	3	3	-
CO-3	1	2	-	2	1	1	-	-	2	-	-	2	3	2	-
CO-4	3	2	2	3	3	3	-	3	2	-	2	2	3	3	-
Avg	2.25	2.50	2.33	2.50	2.00	2.00	0.00	2.67	2.00	0.00	2.00	2.00	2.75	2.75	0.00

PSO1:

Equip students with the latest IT knowledge and skills to tackle real-world challenges.

PSO2:

Foster leadership, critical thinking, problem-solving, and communication skills for IT careers.

PSO3:

Encourage entrepreneurship and innovation through research, start-up projects, industry collaborations, and business skills.

PO1	Engineering Knowledge
PO2	Problem Analysis
PO3	Design/development of solutions
PO4	Conduct investigations of complex Problems
PO5	Modern tool usage
PO6	The engineer and society
PO7	Environment and sustainability
PO8	Ethics
PO9	Individual and team work
PO10	Communication
PO11	Project management and finance
PO12	Life-long learning

S. Thakur
Head
Department of Information Technology
Hindustan College of Science & Technology,
Farah, Mathura

DEPARTMENT OF INFORMATION TECHNOLOGY

www.hcst.edu.in

P. S. ...
Director

Hindustan College of
Science & Technology
FARAH (MATHURA)

CONVENOR



Dr. Shankar Thawkar
Associate Professor
HOD, IT

CO-CONVENOR

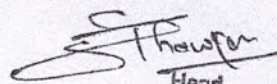


Mrs. Deepti Mittal
Assistant Professor
Dy. HOD, IT

VAC COORDINATOR

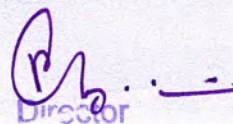


Mr. Ajay Raj Parashar
Assistant Professor
IT Department


Head
Department of Information Technology
Hindustan College of Science & Technology
Farah, Mathura

DEPARTMENT OF INFORMATION TECHNOLOGY

www.hcst.edu.in

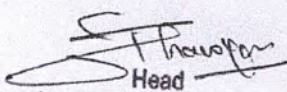

Director

Hindustan College of
Science & Technology
FARAH (MATHURA)

SPEAKERS

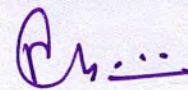


Mr. Ajay Raj Parashar
Assistant Professor
IT Department


Head
Department of Information Technology
Hindustan College of Science & Technology
Farah, Mathura

DEPARTMENT OF INFORMATION TECHNOLOGY

www.hcst.edu.in


Director

Hindustan College of
Science & Technology
FARAH (MATHURA)

COURSE OUTLINE

Problem Solving using C and C++ (VACIT-001)

Module 1: Functions in C/C++

- Introduction to functions
- Alt function syntax
- Function return type deduction
- Static, const, and inline functions
- Default parameters
- Overloaded functions (operator and members)
- Friend Functions
- Overriding functions

Module 2: Arrays and Pointers in C/C++

- Introduction to arrays and pointers
- Smart pointers
- Pointers and dynamic memory allocation
- Type inference
- Array and pointer arithmetic and indirections

Module 3: Secure Coding Practices in C/C++

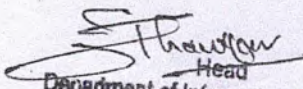
- Common string, integer, and dynamic memory allocation errors
- Integer and dynamic memory allocation vulnerabilities
- String vulnerabilities and mitigation strategies

Module 4: Exception Handling and I/O in C/C++

- Introduction to errors and exceptions
- Exception mechanisms
- Exceptions and polymorphism
- Stack unwinding and cleanup
- Common error handling issues
- Using streams for input and output
- String streams, file streams, and bidirectional I/O
- Dynamic memory allocation model
- Working with dynamic memory, array-pointer duality, and smart pointers.

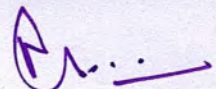
Text Book/References:

- Horowitz and Sahani, "Fundamentals of Data Structures", Galgotia Publications Pvt Ltd Delhi


Head
Department of Information Technology
Hindustan College of Science & Technology
Farah, Mathura

DEPARTMENT OF INFORMATION TECHNOLOGY

www.hcst.edu.in


Director

Hindustan College of
Science & Technology
FARAH (MATHURA)

LECTURE PLAN

Problem Solving using C and C++ (VACIT-001)

Module 1: Functions in C/C++

- Lecture 1: Introduction to functions
- Lecture 2: Alt function syntax
- Lecture 3: Function return type deduction
- Lecture 4: Static, const, and inline functions
- Lecture 5: Default parameters
- Lecture 6: Overloaded functions (operator and members)
- Lecture 7: Friend Functions
- Lecture 8: Overriding functions

Module 2: Arrays and Pointers in C/C++

- Lecture 9: Introduction to arrays and pointers
- Lecture 10: Smart pointers
- Lecture 11: Pointers and dynamic memory allocation
- Lecture 12: Type inference
- Lecture 13: Array and pointer arithmetic and indirections

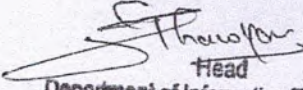
Module 3: Secure Coding Practices in C/C++

- Lecture 14: Common string, integer, and dynamic memory allocation errors
- Lecture 15: Integer and dynamic memory allocation vulnerabilities
- Lecture 16: String vulnerabilities and mitigation strategies

Module 4: Exception Handling and I/O in C/C++

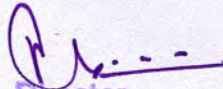
- Lecture 17: Introduction to errors and exceptions
- Lecture 18: Exception mechanisms
- Lecture 19: Exceptions and polymorphism
- Lecture 20: Stack unwinding and cleanup
- Lecture 21: Common error handling issues
- Lecture 22: Using streams for input and output
- Lecture 23: String streams, file streams, and bidirectional I/O fstream

- Lecture 24: Dynamic memory allocation model
- Lecture 25: Working with dynamic memory, array-pointer duality, and smart pointers
- Lecture 26: Review of functions in C/C++
- Lecture 27: Review of arrays and pointers in C/C++indirections
- Lecture 28: Review of secure coding practices in C/C++
- Lecture 29: Review of exception handling and I/O in C/C++
- Lecture 30: Final Exam Review


Head
Department of Information Technology
Hindustan College of Science & Technology
Farah, Mathura

DEPARTMENT OF INFORMATION TECHNOLOGY

www.hcst.edu.in

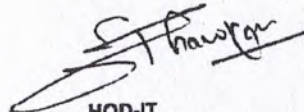

Director
Hindustan College of
Science & Technology
FARAH (MATHURA)

HINDUSTAN COLLEGE OF SCIENCE & TECHNOLOGY, FARAH - MATHURA
Department of Information Technology
Value Added Course - Registration Form
VACIT- 001- Problem Solving Using C/C++

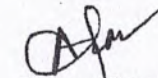
Session: 2021-2022

From 11th April'2022 - 26th June'2022

S.N.	Roll No.	Name of the Student	Department	Semester	Signature of Student
1	2000640130001	ABHAY GOYAL	IT	4TH	Abhay Goyal
2	2000640130003	AMAN AHMED	IT	4TH	Aman
3	2000640130004	AYUSH MITTAL	IT	4TH	Ayush
4	2000640130005	PANKAJ SAKHRANI	IT	4TH	Pankaj
5	2000640130006	PIYUSHA VARSHNEY	IT	4TH	Piyusha
6	2000640130007	SANDEEP SINGH	IT	4TH	Sandeep Singh
7	2000640130008	TUSHANT SHASTRI	IT	4TH	Tushant
8	2000640130009	UDIT UPDAHAY	IT	4TH	Umesh
9	2000640130010	UMESH SINGH	IT	4TH	Umesh
10	2000640130011	VANSH UPADHYAY	IT	4TH	Vansh Upadhyay


HOD-IT
Head

Department of Information Technology
Hindustan College of Science & Technology
Farah, Mathura


Program Coordinator


Director
Hindustan College of
Science & Technology
FARAH (MATHURA)

HINDUSTAN COLLEGE OF SCIENCE & TECHNOLOGY, FARAH - MATHURA

Department of Information Technology
VACIT- 001- Problem Solving Using C/C++

Session: 2021-2022

Session Wise Attendance Sheet

S.N.	Roll No.	Name of the Student	Attendance															Signature
			16/4	23/4	30/4	7/5	21/5	28/5	4/6	11/6	18/6	25/6	2/7	9/7	16/7	23/7		
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
1	2000640130001	ABHAY GOYAL	P	P	A	P	P	A	P	P	P	P	A	P	P	P	A	Abhay goyal
2	2000640130003	AMAN AHMED	P	P	P	P	P	P	P	A	P	P	P	P	P	P	P	aman
3	2000640130004	AYUSH MITTAL	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	Ayush
4	2000640130005	PANKAJ SAKHRANI	P	P	A	P	P	A	P	P	P	P	A	P	P	P	A	Pankaj
5	2000640130006	PIYUSHA VARSHNEY	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	Piyusha
6	2000640130007	SANDEEP SINGH	P	A	P	P	P	P	P	P	P	P	A	P	P	P	A	Sandeep
7	2000640130008	TUSHANT SHASTRI	P	P	P	P	P	P	A	P	P	P	P	P	A	P	P	Tushant Shastri
8	2000640130009	UDIT UPADHYAY	A	P	P	P	P	P	A	P	P	P	P	P	P	P	P	Udit
9	2000640130010	UMESH SINGH	P	P	P	P	P	P	A	P	P	P	P	P	P	P	P	Umesh
10	2000640130011	VANSH UPADHYAY	A	P	P	P	P	P	A	P	P	P	P	A	P	P	P	Vansh upadhyay
Total Attendance																		
Attendance %																		

Total Lectures : 02 X 15 = 30

[Signature]
HOD-IT Head
Department of Information Technology
Hindustan College of Science & Technology
Farah, Mathura

[Signature]
Program Coordinator

[Signature]
Director
Hindustan College of
Science & Technology
FARAH (MATHURA)

HINDUSTAN COLLEGE OF SCIENCE & TECHNOLOGY, FARAH, MATHURA
DEPARTMENT OF INFORMATION TECHNOLOGY
CLASS TIME TABLE FOR EVEN SEMESTER 2021-22

SESSION: 2021-22
 YEAR/SEM: II / 4 IT

W.E.F. 11/04/22
 ROOM NO: 221 A

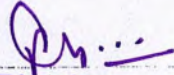
CLASS TEACHER: Mr. Ajay Parashar
 COUNSELORS: Mr. Ajay Parashar

Day \ Time	I	II	III	IV	1:30-02:20	V	VI	VII
	10:10-11:00	11:00-11:50	11:50-12:40	12:40-01:30		02:20-03:10	03:10-04:00	04:00-04:50
MONDAY	WD	OS	T AFL	ES		PDP		SEMINAR
TUESDAY	TC	ES	WD	OS		T AFL	PP LAB	
WEDNESDAY	OS	TC	ES	WD		T AFL	OS LAB	
THURSDAY	TC	PDP		OS		PP	ES	LIBRARY
FRIDAY	T AFL	PP	WD	OS		ES	WD LAB	
SATURDAY	T AFL	TC	WD	PP		VALUE ADDED COURSE (VACIT001)		
						PROBLEM SOLVING USING C/C++		

Class Room No - 221 - B

Subject Code	Name of the Subject	Lecture	Tutorial (A)	Name of the Faculty
KOE041	ENGG. SCIENCE	ES	4	MRS. DEEPTI GUPTA
KAS401	TECHNICAL COMMUNICATION	TC	3	DR. MAMTA SHARMA
KCS401	OPERATING SYSTEM	OS	4	MR. AJAY PARASHAR
KCS402	T AFL	T AFL	4	MRS. DEEPTI MITTAL
KIT401	WEB DESIGNING	WD	4	MRS. DEEPTI MITTAL
KNC402	PYTHIN PRAOGRAMMING	PP	3	MR. SHIV PRATAP
Subject Code	Name of the Practical Lab	Lab Number	Name of the Faculty	
KCS451	OPERATING SYSTEM LAB	OS LAB	MR. AJAY PARASHAR	
KIT451	WEB DESIGNING LAB	WD LAB	MRS. DEEPTI MITTAL	
KCS453	PYTHON PROG. LAB	PP LAB	DR. SHANKAR THAWKAR	
	SEMINAR	SEMINAR	IT DEPARTMENT FACULTY	
VACIT001	VALUE ADDED COURSE (PROBLEM SOLVING USING C/C++)		MR. AJAY PARASHAR	

(Mr. Mohit Singh)
 TT/IC, IT Dept.


Director
 Hindustan College of
 Science & Technology
 FARAH (MATHURA)

(Dr. Shankar Thawkar)
 HOD, IT Dept.
 Department of Information Technology
 Hindustan College of Science & Technology
 Farah, Mathura



CERTIFICATE OF COMPLETION

Department of Information Technology

Academic Session 2021-22

This is to certify that Mr. Aman Ahmed, Roll No. 2000640130003
of Course B. Tech. Information Technology, IV Semester
has successfully completed 30 hours Value Added Course titled
“PROBLEM SOLVING USING C AND C++” (Course Code: VACIT-001).

Dr. Shankar Thawkar
Head of Department

Mr. Ajay Raj Parashar
Course Coordinator

Dr. R. K. Upadhyay
Director

Director
Hindustan College of
Science & Technology
FARAH (MATHURA)



SHARDA
GROUP OF INSTITUTIONS
AGRA • MATHURA • G.NOIDA



HINDUSTAN
College of Science and Technology
Farah, Mathura

CERTIFICATE OF COMPLETION

Department of Information Technology

Academic Session 2021-22

This is to certify that Ms. Piyusha Varshney, Roll No. 2000640130006
of Course B. Tech. Information Technology, IV Semester
has successfully completed 30 hours Value Added Course titled
“PROBLEM SOLVING USING C AND C++” (Course Code: VACIT-001).

Dr. Shankar Thawkar
Head of Department

Mr. Ajay Raj Parashar
Course Coordinator

Dr. R. K. Upadhyay
Director

Director
Hindustan College of
Science & Technology
FARAH (MATHURA)