Hindustan College of Science & Technology, Farah, Mathura

Department of Biotechnology

Date: 11.09. 2021

Notice

All the III & V Sem students of B. Tech. Biotech are hereby informed that the registration for value added course **"Nature Inspired Engineering and Innovation (VBT2105)"** will be started from 13th September 2021 and the last date for registration is 17th September 2021. **The regular classes for value added course will be started from 18th September 2021**. All of you are advised to register yourself timely.

HOD, Biotechnology
Head
Dept. of Bio Technology
Hindustan College of Science & Technology
Farah, Mathura

Director
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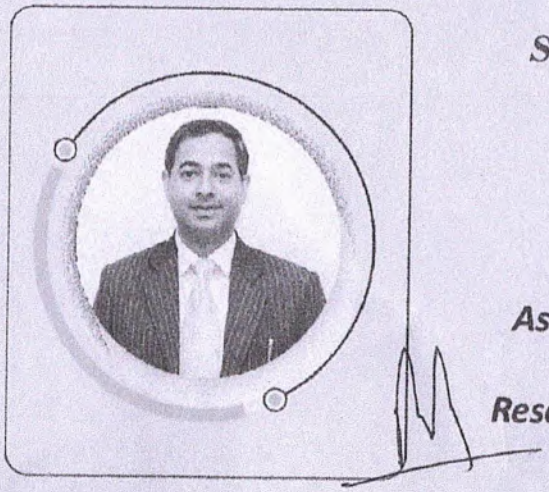
FARAH, MATHURA

DEPARTMENT OF BIOTECHNOLOGY

Value Added Course

VBT2105 - Nature Inspired Engineering and Innovation

18th Sep – 31st Dec, 2021 - Every Saturday: 10:00 AM – 12:00 PM



Students From Any Branch Can Join the Course

By

Dr. Ajay Kumar Sharma

Associate Professor & Head, Department of Biotechnology

Research interests: Application of nature inspired concepts in engineering and innovation

Registration Dates

13th – 16th Sep, 2021

For Registration: Please contact
Mr. Raj Kumar, Office Staff

Prerequisites: Basic interest in Natural phenomenon and good observational skills.

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DEPARTMENT OF BIOTECHNOLOGY

Value Added Course

VBT2101 - Nature Inspired Engineering and Innovation

18th Sep – 31st Dec, 2021 - Every Saturday: 10:00 AM – 12:00 PM

Course Objectives

1. Understand the fundamentals of nature-inspired engineering and its significance in innovation.
2. Explore various principles and strategies derived from nature for engineering design and problem-solving.
3. Analyze and evaluate real-world case studies of nature-inspired engineering solutions.
4. Develop critical thinking and creativity to apply nature-inspired principles in engineering projects.
5. Foster an understanding of sustainability and ethical considerations in engineering practices.

Course Syllabus

Units	Details	Course Out comes
1	Introduction to Nature-Inspired Engineering: Definition and scope of nature-inspired engineering, Historical overview and notable examples of nature-inspired innovations, Benefits and challenges of nature-inspired approaches, Case studies illustrating successful applications of nature-inspired engineering	CO1
2	Principles of Biomimicry: Introduction to biomimicry and its relevance in engineering, Fundamental principles of biomimetic design, Analysis of biological systems for engineering inspiration, Biomimetic materials and structures in engineering applications	CO2
3	Biomaterials and Bioinspired Materials: Introduction to biomaterials and their properties, Bioinspired materials: hierarchical structures and functional properties, Design and fabrication of bioinspired materials for engineering applications	CO3
4	Nature-Inspired Energy Systems: Energy harvesting from nature: solar, wind, and tidal energy, Bio-inspired energy conversion and storage systems, Biomimetic approaches for energy-efficient engineering	CO4
5	Sustainability and Ethics in Nature-Inspired Engineering: Environmental sustainability in engineering design, Ethical considerations in nature-inspired engineering, Responsible innovation and social impact assessment	CO5

Prerequisites: Basic interest in Natural phenomenon and good observational skills.

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DEPARTMENT OF BIOTECHNOLOGY

Value Added Course

VBT2101 - Nature Inspired Engineering and Innovation

18th Sep – 31st Dec, 2021 - Every Saturday: 10:00 AM – 12:00 PM

Course Outcomes

CO1	*Understand the scope, benefits, challenges, and successful applications of nature-inspired engineering.*
CO2	*Apply fundamental principles of biomimetic design and analyze biological systems for engineering inspiration.*
CO3	*Learn the approaches used in bioinspired materials with hierarchical structures and functional properties.*
CO4	*Utilize biomimetic approaches for energy-efficient engineering and energy conversion/storage systems.*
CO5	*Incorporate environmental sustainability, ethical considerations, and responsible innovation in nature-inspired engineering practices.*

CO-PO & CO-PSO Mapping

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		1	1											
CO2	2	2	3	2					1	1			3	
CO3			3	1	1				1				1	
CO4	2	2	3	2					1	1			3	1
CO5			2			2	3	3						
Average	2	1.67	2.4	1.67	1	2	3	3	1	1			2.33	1

Evaluation Criteria: Class participation, engagement in discussions, quizzes, assignments, group projects, presentations

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DEPARTMENT OF BIOTECHNOLOGY

Value Added Course

VBT2105- Nature Inspired Engineering and Innovation

18th Sep – 31st Dec, 2021 - Every Saturday: 10:00 AM – 12:00 PM

Program Schedule

Session	Date	Time	No. of Hours	Session Topic	Resource Person
1	18-09-2021	10:00 AM - 12:00 PM	2	Definition and scope of nature-inspired engineering	Dr. Ajay Kumar Sharma
2	25-09-2021	10:00 AM - 12:00 PM	2	Historical overview and notable examples of nature-inspired innovations	Dr. Ajay Kumar Sharma
3	09-10-2021	10:00 AM - 12:00 PM	2	Introduction to biomimicry and its relevance in engineering	Dr. Ajay Kumar Sharma
4	23-10-2021	10:00 AM - 12:00 PM	2	Fundamental principles of biomimetic design	Dr. Ajay Kumar Sharma
5	30-10-2021	10:00 AM - 12:00 PM	2	Introduction to biomaterials and their properties	Dr. Ajay Kumar Sharma
6	13-11-2021	10:00 AM - 12:00 PM	2	Bioinspired materials: hierarchical structures and functional properties	Dr. Ajay Kumar Sharma
7	20-11-2021	10:00 AM - 12:00 PM	2	Design and fabrication of bioinspired materials	Dr. Ajay Kumar Sharma
8	04-12-2021	10:00 AM - 12:00 PM	2	Energy harvesting from nature: solar, wind, and tidal energy	Dr. Ajay Kumar Sharma
9	11-12-2021	10:00 AM - 12:00 PM	2	Bio-inspired energy conversion and storage systems	Dr. Ajay Kumar Sharma
10	18-12-2021	10:00 AM - 12:00 PM	2	Environmental sustainability in engineering design	Dr. Ajay Kumar Sharma
11	28-12-2021	10:00 AM - 12:00 PM	2	Ethical considerations in nature-inspired engineering	Dr. Ajay Kumar Sharma
12	29-12-2021	10:00 AM - 5:00 PM	6	Hands-on projects applying nature-inspired engineering principles,	Dr. Ajay Kumar Sharma
13	30-12-2021	10:00 AM - 5:00 PM	6	Design and prototyping of nature-inspired solutions and presentations	Dr. Ajay Kumar Sharma
14	31-12-2021	10:00 AM - 12:00 PM	2	Design and prototyping of nature-inspired solutions & presentations	Dr. Ajay Kumar Sharma
Total number of hours covered			36		

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DEPARTMENT OF BIOTECHNOLOGY ENGINEERING, HCST, MATHURA

SESSION:2021-22 | **CLASS TIME TABLE** w.e.f. 08/09/21

YEAR/SEM: 2nd Yr/ III Sem | **Room No. : 303** | **Class Teacher & Counsellor :** Dr. Ajay Kumar Sharma

Time / Day	I	II	III	IV	V	VI	VII	VIII
	10:10 - 11:00	11:00 - 11:50	11:50 -12:40	12:40 - 01:30	01:30 - 02:20	02:20 - 03:10	03:10 - 04:00	04:00 - 04:50
MONDAY	BC (KBT 303)	ESE (KOE 033)	MI (KBT 302)	CSS (KNC 301)	LUNCH BREAK	TBT (KBT 301)	TC	MP/I (KBT 354)
	APC	RKT	AKS	AB		SS	KD	AKS
TUESDAY	CSS (KNC 301)	PDP		MI (KBT 302)		TBT Lab (KBT 351)		BC (KBT 303)
	AB	PG		AKS		SS		APC
WEDNESDAY	MI (KBT 302)	TBT (KBT 301)	BC (KBT 303)	ESE (KOE 033)		PDP		TC
	AKS	SS	APC	RKT		PG		KD
THURSDAY	MI (KBT 302)	ESE (KOE 033)	TC	TBT (KBT 301)		MI Lab.		BC (KBT 303)
	AKS	RKT	KD	SS		AKS		APC
FRIDAY	MP/I (KBT 354)	TC (T)	ESE (KOE 033-T)	MI-T (KBT 302)		TBT (KBT 301)	BC Lab.	
	AKS	KD	RKT	AKS		SS	APC	
SATURDAY	Value Added Course: "Nature Inspired Engineering and Innovation" (VBT-2105)		ESE-T (KOE 033)	CSS (KNC 301)		TBT-T (KBT 301)	SKIL DEVELOPMENT	
	AKS		RKT	AB		SS	AKS	

Subject S.No.	Subject code	Name of Subject	Abbv. Used
1	KOE 033	Energy Sciences & Engineering	ESE
2	KAS 301	Technical Communication	TC
3	KBT 301	Techniques in Biotechnology	TBT
4	KBT 302	Microbiology & Immunology	MI
5	KBT303	Biochemistry	BC
6	KNC 301	Computer System Security	CSS
7		Personality Development Program	PDP
8	KBT 351	Techniques in Biotechnology lab	TBT-lab
9	KBT 352	Microbiology & Immunology Lab	MI-lab
10	KBT353	Biochemistry Lab	BC lab
11	KBT 354	Mini Project or Internship Assessment	MP/I
12	VBT2105	Value Added Course	

Name of the Faculty Member	Faculty code	Faculty mob. No
Dr. R.K.Tiwari	RKT	9568006051
Dr. Keshav Dev	KD	9412558688
Ms. Shivi Sharma	SS	9410224170
Dr. Ajay Kumar Sharma	AKS	9412104179
Dr. Arun Prasad Chopra	APC	9568006057
Mr. Atul Barsaiyan	AB	8958006661
Ms. Pooja Gupta	PG	8006426655
Ms. Shivi Sharma	SS	9410224170
Dr. Ajay Kumar Sharma	AKS	9412104179
Dr. Arun Prasad Chopra	APC	9568006057
Dr. Ajay Kumar Sharma	AKS	9412104179
Dr. Ajay Kumar Sharma	AKS	9412104179

TIME TABLE INCHARGE	Ms. Shivi Sharma, Mob. 9410224170, E-mail shivi.sharma.hcst@sgei.org		H.O.D.	Dr. Ajay Kumar Sharma

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DEPARTMENT OF BIOTECHNOLOGY ENGINEERING, HCST, MATHURA

CLASS TIME TABLE w.e.f. 08/09/21

SESSION:2021-22

YEAR/SEM: 3rd Yr/ V Sem

Room No. : 304

Class Teacher & Counsellor : Ms. Shivi Sharma

Time / Day	I	II	III	IV	V	VI	VII	VIII
	10:10 - 11:00	11:00 - 11:50	11:50 -12:40	12:40 - 01:30	01:30 - 02:20	02:20 - 03:10	03:10 - 04:00	04:00 - 04:50
MONDAY	FBT (KBT 502)	BI-I (KBT 503)	GE (KBT 501)	PCB (KBT 051)		PDP		Mini Project /Internship
	VK	SS	APC	AKS		MG		APC
TUESDAY	BAT (KBT 055)	BI-I (KBT 503)	PCB (KBT 051)	COI		FBT (KBT 502)	FBT (KBT 502)	COI
	VK	SS	AKS	SSK		VK	VK	SSK
WEDNESDAY	FBT (KBT 502)	PDP		GE (KBT501)		BAT (KBT 055)	GE Lab. (KBT551)	
	VK	PG		APC		VK	APC	
THURSDAY	FBT (KBT 502)	BI-I (KBT 503)	PCB (KBT 051)	BAT (KBT 055)		BI-I LAB (KBT 553)		COI
	VK	SS	AKS	VK		SS		SSK
FRIDAY	GE (KBT501)	GE (KBT501)	PCB (KBT 051)	BI-I (KBT 503)		BAT (KBT 055)	SKIL DEVELOPMENT	
	APC	APC	AKS	SS		VK	APC	
SATURDAY	Value Added Course: "Nature Inspired Engineering and Innovation" (NBT-2105)		BI-I T(KBT 503)	GE (KBT501)		FBT Lab. (KBT 552)		Mini Project /Internship
	AKS		SS	APC		VK		APC

LUNCH BREAK

THEORY

Subject S.No.	Subject code	Name of Subject	Abrv. Used	Name of the Faculty Member	Faculty code	Faculty mob. No
1	KBT501	Genetic Engineering	GE	Dr. Arun Prasad Chopra	APC	9568006057
2	KBT502	Fermentation Biotechnology	FBT	Mr. Vipin Kumar	VK	9454712850
3	KBT503	Bioinformatics-I	BI-I	Ms. Shivi Sharma	SS	9410224170
4	KBT051	Pharmaceutical Biotechnology	PCB	Dr. Ajay Kumar Sharma	AKS	9412104179
5	KBT055	Biofuels & Alcohol Technology	BAT	Mr. Vipin Kumar	VK	9454712850
6	KNC501	Constitution of India	COI	Mr. Shashi Shekhar	SSK	8439004265
7		Personality Development Program	PDP	Mr. Mohit Gupta	MG	9027980136
8		Mini Project or Internship	MP/I	Ms. Pooja Gupta	PG	8006426655
9	KBT 551	Genetic Engineering Lab	GE Lab	Dr. Arun Prasad Chopra	APC	9568006057
10	KBT552	Fermentation Biotechnology Lab	FBT. Lab	Dr. Arun Prasad Chopra	APC	9568006057
11	KBT553	Bioinformatics-I Lab	BI-I Lab	Mr. Vipin Kumar	VK	9454712850
12	VBT-2105	Value Added Course: "Nature Inspired Engineering and Innovation"	Skill Development	Ms. Shivi Sharma	SS	9410224170
				Dr. Ajay Kumar Sharma	AKS	9412104179
TIME TABLE INCHARGE		Ms. Shivi Sharma, Mob. 9410224170, shivi.sharma.hcst@gc.org			H.O.D.	Dr. Ajay Kumar Sharma

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Department of Biotechnology Engineering

Value Added Course - Registration Form

Course Name: Nature Inspired Engineering and Innovation Course Code: VBT2105

Session 2021-22 | **From September, 2021 to December, 2021**

Sr. No.	Roll No.	Name	Department	Semester	Signature of Student
1	2000640540001	Anisha Kumari	Biotechnology	III	Anisha
2	2000640540003	Astha Baghel	Biotechnology	III	Astha
3	2000640540004	Dishita Singh	Biotechnology	III	DSingh
4	2000640540005	Khushi Sajjan	Biotechnology	III	Khushi
5	2000640540006	Raj Chaudhary	Biotechnology	III	Raj Chaudhary
6	2000640540007	Rajat Singh	Biotechnology	III	Rajat Singh
7	2000640540008	Richa Shivhare	Biotechnology	III	Richa
8	2000640540009	Sanjana Agarwal	Biotechnology	III	sanjana
9	2000640540010	Sujal Singh	Biotechnology	III	Sujal
10	2100640548001	Shailendra Pratap Singh	Biotechnology	III	Shailendra
11	1900640540001	Ankit Baghel	Biotechnology	V	Ankit Baghel
12	1900640540002	Anshika Gupta	Biotechnology	V	Anshika
13	1900640540003	Ashutosh Upadhyay	Biotechnology	V	Ashutosh Upadhyay
14	1900640540004	Ayush Sharma	Biotechnology	V	Ayush
15	1900640540006	Ragini Singh	Biotechnology	V	Ragini
16	1900640540007	Ritu Singh	Biotechnology	V	Ritu Singh
17	1900640540008	Shivendra Gupta	Biotechnology	V	Shivendra
18	1900640540009	Shobhita Sisodiya	Biotechnology	V	Shobhita

Total Registered Students = (18)

18/09/2021

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Hindustan College of Science & Technology

Department of Biotechnology Engineering

Value Added Course - Registration Form

Course Name: Nature Inspired Engineering and Innovation Course Code: VBT2105

Session 2021-22 (Year 2021)

Session wise Attendance Sheet

S. No.	Roll No.	Name	SEM	Signature of the Student														
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
				18-Sep	25-Sep	9-Oct	23-Oct	30-Oct	13-Nov	20-Nov	4-Dec	11-Dec	18-Dec	28-Dec	29-Dec	30-Dec	31-Dec	
1	2.00064540001	Anisha Kumari	III								A							
2	2000640540003	Astha Baghel	III					A										
3	2000640540004	Dishita Singh	III															
4	2000640540005	Khushi Sajjan	III			A					A							
5	2000640540006	Raj Chaudhary	III					A										
6	2000640540007	Rajat Singh	III															
7	2000640540008	Richa Shivhare	III							A								
8	2000640540009	Sanjana Agarwal	III							A								
9	2000640540010	Sujal Singh	III			A	A					A						
10	2100640548001	Shailendra Pratap Singh	III		A				A				A					
11	1900640540001	Ankit Baghel	V		A				A			A						
12	1900640540002	Anshika Gupta	V															
13	1900640540003	Ashutosh Upadhyay	V			A								A				
14	1900640540004	Ayush Sharma	V				A											
15	1900640540006	Ragini Singh	V				A											
16	1900640540007	Ritu Singh	V		A				A			A	A					
17	1900640540008	Shivendra Gupta	V															
18	1900640540009	Shobhita Sisodiya	V					A			A				A			

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Certificate of Completion

Department of Biotechnology
Academic Session 2021-22

This is to certify that Ms. Dishita Singh, Roll No: 2000640540004 of Course: B. Tech. Biotechnology, III semester has successfully completed 36 hours Value Added Course titled "Nature Inspired Engineering and Innovation" (Course code: VBT2105).

Course Coordinator & Head of Department

Director, HCST

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Certificate of Completion

Department of Biotechnology
Academic Session 2021-22

This is to certify that Ms. Anshika Gupta, Roll No: 1900640540002 of Course: B. Tech. Biotechnology, V semester has successfully completed 36 hours Value Added Course titled "Nature Inspired Engineering and Innovation" (Course code: VBT2105).

Course Coordinator & Head of Department

Director, HCST

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