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UNITEDWORLD SCHOOL OF COMPUTATIONAL INTELLIGENCE (USCI)

DEPARTMENT OF COMPUTER SCIENCE (DCS)

Course File

21UCS2107: Introduction to Industry 4.0

L T P C	3 0 0 3
Course Type	Theory
Semester Offered	Sem. I
Academic Year	2021 – 22
Slot	Tue3 (11:05-11:55), Wed5 (13:40-14:30), Thu (15:50-16:40)
Class Room	G01
Faculty Details	
Name	Dr. Thirunavukkarasu Kannapiran
Website link	
Designation	Professor
School	Unitedworld School of Computational Intelligence
Cabin No	Faculty Cabin-First Floor
Intercom	Not available
Open Hours	Tuesday 10:05 AM – 10:55 AM Thursday 11:05 AM – 11:55 AM
Please indicate the name(s) of other faculty who is/are handling this Course	NIL

COURSE FILE INDEX



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Task No	Course Items Description	Page No
1	Syllabus Description	6
2	Course Description- Table of details of sessions and Bloom's Taxonomy Level, method of teaching such as team based learning/flipped class room, references, web links, etc., COs, POs, PSOs, CO-PO-PSO mapping, with justification.	8
3	Session Planner / Syllabus Coverage with Text/Reference books used, with columns for planned date, actual date of delivery and reason for deviation if any & Unit Completion Date (course handout, session planner and course description(item #2) to be given to students).	15
4	Time Table of class & self	20
5	Student list, parent and student communication details (Mobile No, Address & E-Mail ID of parent & Student)	24
6	Material to be ordered unit wise a) Class notes - Hard copy (Hand written only minimum 25 papers (both sides) per unit. All topics of units should be covered in the hand written material with proper reference to text and/or reference books.) & Soft copy of ppt (presentation and sessionwise handout to be given to students during each session), other learning materials b) Thirty objective bits with answer for each unit - multiple choice questions (50%) and fill in the blank questions (50%) c) Six Assignment Questions per unit along with solution d) Six Tutorials questions per unit with answers	26
7	Student seminar topics and evaluation of student presentation.	
8	a) List of simultaneously on-going Massive Open Online Courses (MOOCs) having similar contents of the course, NPTEL and SWAYAM video links relevant to course topics, relevant MIT OCW/other similar OCW links, links to eminent professors blogs/course contents, links to surveys and tutorials from IEEE. b) Documents relating to the use of these resources by students under faculty supervision and performance outcome evaluation.	
9	a) Two complete sample Micro (I Year) / Mini projects (II, III & IV Year), and list of tentative mini/micro projects b) Documents in support of mini/micro-projects carried out by students and the evaluation. c) Any innovative mini/micro-projects leading to major projects/patents.	



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10	Quiz(1-5) (with 20 questions for each unit with 50% mcq and 50% fill in the blank questions), Assignment 1, Assignment 2, MTE Question Papers with CO-s and Bloom's Taxonomy Level, ETE, Quality and Scheme of Evaluation along with marks and Ideal Solutions for all. (Note: One Quiz exam per unit)	
11	Sample Solution Copies (One from each category of best, medium & poor) for Assignments as submitted by students	33
12	Samples of quiz(1-5), CAT-1, CAT-2 answer sheets of high, average and low performing students	
13	List of slow learners with their grade so far, quiz and CAT marks & Action plan for enhanced learning(tutoring, more handouts/materials, etc.) and proof of action and outcomes through evaluation.	40
14	List of fast learners with their grade so far, quiz and CAT marks & Action plan for higher achievement (such as projects, papers, etc.) and proof of action and outcomes through evaluation.	
15	Target for University result in terms of pass percentage and average grade.	
16	PBL - documents related to Les Driving Question, Need to Knows, Entry Event, Voice and Choice and performance outcome evaluation of students at each stage of revision and presentation to the public audience.	
17	Activity based learning - Quiz and discussion, Think-Pair-share, Learning Cell, Team-based learning, Flipped class room with proof of learning outcomes through evaluation (see the attached document).	
18	Innovative teaching-learning techniques adopted for active-teaching-learning process with proof of learning outcomes through evaluation.	
19	Performance Analysis and continuous monitoring of each student with proof of counseling and/or mentoring, and actions taken by students with proof of improved learning outcomes.	
20	Last year university question paper copy	
21	Content beyond syllabus - attach documents in support of delivery with justification, list PO-s covered and evaluation of students learning outcomes.	
22	Self-learning outcomes from Eminent Professors Blogs/Websites/MOOCs/NPTEL/SWAYAM/MIT OCW/Journals & E-Links through evaluation.	
23	Documents in support of extramural/guest lecture with list of PO-s covered and evaluation of students learning outcomes.	



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24	Details of units/topics handled by industry professionals and learning outcomes through evaluation.	
25	Result analysis, with CO attainment calculation for Quiz, Assignments, MTE and ETE for all tests/exam.	
26	Attendance Register Complete in all information and analysis.	
27	Minutes of Quality Circle Meeting related to the course involving student representatives.	
28	Suggestions made by course committee/ instructor/ students for modification in course contents and for enhanced teaching and learning of the course.	
29	Course survey questionnaires and results	

**UNITEDWORLD SCHOOL OF COMPUTATIONAL INTELLIGENCE (USCI)**

Course code	Course Name	Hours/week			Credit	Max. Marks
21UCS1107	Introduction To Industry 4.0	L	T	P	C	100
		3	0	0	3	
Pre-Requisite	NA					
Evaluation Scheme	Theory				Hours	Marks
	External (End Semester Exam)				3	70
	Internal (1) Midterm + Assignment/Seminar + Quiz – 25 Marks / (2) Attendance -5 Marks)				1	30
Objective(s)	<ul style="list-style-type: none"> To create awareness on Industry automation. To inculcate knowledge and exposure on framework and roadmap. To provide basic familiarity about Advances in Robotics in the Era of Industry 4.0 					
UNIT-I	INTRODUCTION TO INDUSTRY 4.0					8
Introduction, core idea of Industry 4.0, origin concept of industry 4.0, Industry 4.0 production system, current state of industry 4.0, Technologies, How is India preparing for Industry 4.0						
UNIT-II	A CONCEPTUAL FRAMEWORK FOR INDUSTRY 4.0					8
Introduction, Main Concepts and Components of Industry 4.0, State of Art, Supportive Technologies, Proposed Framework for Industry 4.0.						
UNIT-III	TECHNOLOGY ROADMAP FOR INDUSTRY 4.0					8
Introduction, Proposed Framework for Technology Roadmap, Strategy Phase, Strategy Phase, New Product and Process Development Phase.						
UNIT-IV	ADVANCES IN ROBOTICS IN THE ERA OF INDUSTRY 4.0					8
Introduction, Recent Technological Components of Robots- Advanced Sensor Technologies, Internet of Robotic Things, Cloud Robotics, and Cognitive Architecture for Cyber-Physical Robotics, Industrial Robotic Applications- Manufacturing, Maintenance and Assembly.						



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UNIT-V	THE ROLE OF AUGMENTED REALITY IN THE AGE OF INDUSTRY 4.0	8
Introduction, AR Hardware and Software Technology, Industrial Applications of AR.		
Total hours		40 periods
Outcome(s)	At the end of the course, the students will be able to: CO1: Understand the importance of industry 4.0 CO2: Analyse the components of Industry 4.0 CO3: Study the framework for technology roadmap of Industry 4.0 CO4: Implement advances of robotics in Industry 4.0. CO5: Study Augmented Reality in the Age of Industry 4.0	



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Course Handout/Description		
1	Course details	
	Faculty name	Dr. Thirunavukkarasu Kannapiran
	Programme	B.Sc. (Hons.) Computer Science/Data Science/AI & ML (UCS/UDS/UAM)
	Semester	I
	Section	1,2,3
	Course code	21UCS1207
	Course title	Introduction to Industry 4.0
2	Vision of the Unitedworld School of Computational Intelligence (USCI)	
	The vision of Unitedworld School of Computational Intelligence (USCI) is to be known globally as a School of Excellence that provides transformative educational experience, creating positive societal impact through establishment of global centers of higher learning in emerging technology areas of computational intelligence in pursuit of academic excellence.	
3	Mission of the Unitedworld School of Computational Intelligence (USCI)	
	M1: To foster critical thinking amongst students and instilling in them the values, skills and attitude to become lifelong learners and efficient problem solvers M2: To ensure seamless integration of academics, research and innovation for nurturing professional excellence and entrepreneurship M3: To create an environment for holistic development of learners by strengthening student centric welfare activities in pursuit of building socially responsible citizens	



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4	Programme Educational Objectives (PEOs)	
	PEO1	To prepare graduates with a strong foundation in Computer Science and Applications and problem-solving & programming skills in order to build successful careers professionals in industry, government, academia, research, entrepreneurial pursuit and consulting firms.
	PEO2	To equip students with analytical, design, development and soft skill to find innovative solutions to the real-world problems in collaboration with industry and professional societies.
	PEO3	To inculcate entrepreneurship, managerial skills and team work in our students through demonstration of good analytical, design and implementation skills for the betterment of individual and society at large.
	PEO4	To produce graduates who are ethical, socially responsible and lifelong learners to fulfill their goals.
5	Programme outcomes	
	PO1	Graduates will have the necessary skills and knowledge not only in the field of computer and information technology, but also in communication and will be successful professionals in service industry, consulting firms and entrepreneurial pursuit.
	PO2	To achieve peer-recognition students will have ability to coordinate and work in teams, by adopting ethics, communicate effectively and manage projects in multidisciplinary environment and updating oneself by indulging into self-directed learning and conduct investigation of complex computing problems.
	PO3	Able to apply Computer based solutions and its contemporary issues in global, societal context, as well as in entrepreneurship areas and continue a lifelong professional development in computing



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	PO4	An ability to visualize and solve problems using appropriate software development strategy and standards.
	PO5	An ability to design and implement database solutions using available technologies
	PO6	An understanding of design and working principles of the computer system.
	PO7	An ability to work effectively as an individual as well as a member of a team and provide technical and visionary leadership to others.
	PO8	An ability to apply ethical and legal issue of computer application with an awareness of social issues and responsibilities
	PO9	In-hand Skills, expertise and Knowledge on Advanced Computing techniques like Big Data, Open Source, mobile development application, multimedia, oracle11g, CISCO and other recent trends in advanced computing
	PO10	Excellent verbal communication skills with capability to work in multidisciplinary teams with positive attitude
	PO11	Acquired skills and to recognize the need for life-long learning for continuing professional development.
	PO12	An ability to devise and conduct experiments, interpret data and provide well informed conclusions
6	Programme Specifics Outcome (PSO) (if any)	
	PSO1	Data Science graduates are able to become leaders in the society with the help of advanced knowledge and skill, which can empower them to analyses, design, develop and implement their learning to develop the society.
	PSO2	Ability to develop skills to address and solve social and environmental problem with ethics and perform multidisciplinary projects with advance technologies and tools.



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	PSO3	Implement professional knowledge in setting up road map to be an entrepreneur and identify research areas.				
7	Course outcomes (COs)					
	CO1	Understand the importance of industry 4.0				
	CO2	Analyze the components of Industry 4.0				
	CO3	Study the framework for technology roadmap of Industry 4.0				
	CO4	Implement advances of robotics in Industry 4.0.				
	CO5	Study Augmented Reality in the Age of Industry 4.0				
8	Evaluation Component	Duration	Marks	Date & Time	Nature of Component	Evaluation Component
			(30)			
	Internal Component					
	Mid Term	90 mins	50 (15)		Closed Book	Mid Term
	Quiz-1/2 Assignment/A ssignment	15 mins each	5+5 (10)		Closed Book	Quiz/Assignme nt/Attendance
	Attendance		5 marks			
	External Component					
	End Term	180 mins	100 (70)		Closed Book	End Term



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9	<p>List of Teaching – Learning pedagogy</p> <ul style="list-style-type: none">• Active and Collaborative Learning• Experiment based Learning• Flipped Classrooms• Open Hours• Students’ seminar• Technology Training
10	<p>Open hour for students Tuesday: 12.10 PM to 1.30 PM Friday: 1.30 PM to 2.20 PM</p>
11	<p>Link address for course materials https://onlinecourses.nptel.ac.in/noc20_cs69/preview</p>
12	<p>Recommended list of e-books.</p> <ol style="list-style-type: none">1. Bruno S. Sergi, Elena g. Popkova, Aleksei v. Bogoviz, Tatiana n. Litvinova, “Understanding industry 4.0: AI, the internet of things, and the future of work”, Emerald Publishing Limited, 2019.2. Diego Galar Pascual, Pasquale Daponte, Uday Kumar, “Handbook of Industry 4.0 and SMART Systems”, CRC Press, 2020.
13	<p>Recommended list of online courses like SWAYYAM/NPTEL/MOOCs etc Course url: https://onlinecourses.nptel.ac.in/noc20_cs69/preview Course url: https://ocw.mit.edu/courses/intro-programming/ Course url: https://www.bosch.com/stories/10-years-industry-4-0-at-bosch/ https://www.youtube.com/watch?v=GNgtJC6axbA https://www.i-scoop.eu/industry-4-0/</p>
14	<p>Recommended list of mini projects / projects/ technical training etc.</p> <ol style="list-style-type: none">1. Digital Manufacturing2. Energy Monitoring3. Industrial IoT



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Course Outcomes (COs) Assessment Table:

COs	Knowledge level	Assessment tools			
		Mid Term	End Term Exam	Mini Project	Target
Understand the importance of industry 4.0	K1	1	ETE	NA	100%
Analyze the components of Industry 4.0	K4	2	ETE	NA	100%
Study the framework for technology roadmap of Industry 4.0	K2	3	ETE	Yes	100%
Implement advances of robotics in Industry 4.0.	K5		ETE	Yes	100%
Study Augmented Reality in the Age of Industry 4.0	K3		ETE	NA	100%

It is seen that efforts are to be taken to achieve the following level of knowledge i.e., K2, K3, K4, K6 through this course. (K1-Remembering, K2-Understanding, K3-Appling, K4-Analyzing, K5-Evaluating, K6-Creating)

Course outcomes (COs) and Program Outcome Mapping

	CO/PO Mapping														
	(S/M/W indicates strength of correlation) S-Strong, M-Medium, L-Low														
COs	Programme Outcomes (POs)														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	M									L			L	S	L
CO2	M				S				M				M		
CO3	M								S				M	S	



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CO4	M												M		M
CO5	M										S			M	M

Topic with lesson plan with outcome-based focus:

Note: Teaching Methodology (Lecture, discussion, quiz, student seminar, demonstration, tutorial, flip class)

Note: Topic wise class notes is to be prepared by the teacher as per format enclosed

Sample



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Session Planner

Session No.	Date	Topic proposed to be covered	Unit #	References for reading (book / journals / websites)	Teaching methodology	Focus for CO achievement	Activities	Reference to Material	Project / Research Problem
1	Day1	Introduction to Industry	1	R1	Lecture	CO1			
2	Day2	Core idea of Industry 4.0	1	R1	Student Seminar	CO1			
3	Day3	Origin concept of industry 4.0	1	R1	Activity	CO1			
4	Day4	Industry 4.0 production system	1	R1	Demonstration	CO1			
5	Day5	Current state of industry 4.0	1	R1	Discussion	CO1			
6	Day6	Technologies	1	R1	Activity	CO1			
7	Day7	How is India preparing for Industry 4.0	1	R1, R2	Activity	CO1	Jigsaw	https://www.samarthudyog-i40.in/project	Gross Domestic Product compound annual



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									growth rate
8	Day8	How is India preparing for Industry 4.0	1	R1, R2	Activity	CO1	Jigsaw	https://www.samarthudyogi40.in/project	Gross Domestic Product compound annual growth rate
9	Day9	Conceptual framework	2	R1, R2	Lecture	CO2			
10	Day10	Main Concepts and Components of Industry 4.0	2	R1, R2	Demonstration	CO2			
11	Day11	Main Concepts and Components of Industry 4.0	2	R1, R2	Flip Class	CO2		Use Cases	
12	Day12	State of Art-Industry 4.0	2	R2	Lecture	CO2			
13	Day13	Supportive Technologies	2	R2	Lecture	CO2			



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14	Day14	Proposed Framework for Industry 4.0.	2	R2	Lecture	CO2			
15	Day15	Proposed Framework for Industry 4.0.	2	R2	Activity	CO2	Concept mapping		
16	Day16		2	R2	Activity	CO2	Concept mapping		
17	Day17	Introduction	3	R2	Lecture	CO3			
18	Day18	Proposed Framework for Technology Roadmap	3	R2	Lecture	CO3			
19	Day19	Proposed Framework for Technology Roadmap	3			CO3			
20	Day20	Proposed Framework for Technology Roadmap	3	R2	Activity	CO3	Concept mapping		



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21	Day21	Strategy Phase	3	R2	Activity	CO3	Concept mapping		
22	Day22	New Product and Process Development Phase	3	R2	Activity	CO3	Concept mapping		
23	Day23	New Product and Process Development Phase	3	R2	Activity	CO3	Concept mapping		
24	Day24	New Product and Process Development Phase	3	R2	Flip Class	CO3		Use Cases	
25	Day25	Introduction	4	R1	Lecture	CO4			
26	Day26	Recent Technological Components of Robots-Advanced Sensor Technologies	4	R1	Demonstration	CO4			
27	Day27	Internet of Robotic Things	4	R1	Lecture	CO4			



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28	Day28	Cloud Robotics	4	R1	Lecture	CO4			
29	Day29	Cognitive Architecture for Cyber-Physical Robotics,	4	R1	Lecture	CO4			
30	Day30	Industrial Robotic Applications	4	R1	Lecture	CO4			
31	Day31	Manufacturing	4	R1	Lecture	CO4			
32	Day32	Industrial - Maintenance	4	R1	Lecture	CO4			
33	Day33	Role of AR in i4.0- Introduction	5	R1	Lecture	CO5			
34	Day34	AR Hardware	5	R1	Lecture	CO5			
35	Day35	AR Hardware	5	R1	Lecture	CO5			
36	Day36	AR Software Technology	5	R1	Lecture	CO5			
37	Day37	AR Software Technology	5	R1	Activity	CO5	Concept mapping		
38	Day38	Industrial Applications of AR	5	R1	Lecture	CO5			



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39	Day39	Industrial Applications of AR	5	R1	Lecture	CO5		
40	Day40	Case Study	5	R1	Flip Class	CO5	Use Cases https://home.kpmg/xx/en/home/insights/2018/1/1/industry-4-0-case-studies.html	



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Unitedworld School of Computational Intelligence (USCI)
Department of Computer Science (DCS)

CLASS TIME TABLE

B.Sc. (Hons.) (Computer Science) / Specializations - Data Science / AI & Machine Learning
Batch-2021 - First Year - First Semester (Sep. '21 - Jan '22)

Version: 1.0

W.E. F.: 21.09.2021

Lecture Hall No.: G Block- Ground Floor - G0

Time Period Day	09.05 - 09.55	10.05 - 10.55	11.05 - 11.55	12.05 - 12.55	12.55 - 13.40	13.40 - 14.30	14.50 - 15.40	15.50 - 16.40
	1	2	3	4	Lunch Break	5	6	7
Mon	←---1108---→		1105	1106		RIL	←----1110--→	
Tue	1102	1101	1107	1104		←---1108---→		1105
Wed		1101	1102	1104		1107	1106	1103
Thu	1103			1105		←-----1109----→		1107
Fri	1104	1103	←-----1109----→			1102		



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S No	Subject Code & Title	Name of the Faculty	L-T-P-C	# Hrs.
1	21HUM1101 - Communicative English	Visiting Faculty-1	2-0-0-2	2
2	21UCS1102 - Problem Solving and Progg.,	Prof. Karthick Rajan	3-0-0-3	3
3	21UCS1103 - Applied Mathematics	Dr. Raju Shanmugam	3-0-0-3	3
4	21UCS1104 - Digital Computer Fundamentals	Dr. Manivel Kandasamy	3-0-0-3	3
5	21UCS1105 - Computational Statistics	Dr. Thirunavukkarasu K	3-0-0-3	3
6	21HUM1106 - Professional Ethics	Dr. Avadhesh Kumar Gupta	2-0-0-2	2
7	21UCS1107 - Introduction to Industry 4.0	Dr. Thirunavukkarasu K	3-0-0-3	3
8	21UCS1108 - Problem Solving using C Lab	Dr. Avadhesh Kumar Gupta	0-0-4-2	4
9	21UDS1109 - Data Analysis using Excel Lab	Dr. Manivel Kandasamy	0-0-4-2	4
10	21NTCC1110 - Leadership Development	Dr. Avadhesh Kumar Gupta	0-0-2-1	2
11	Research In Library (RIL)	Dr. Avadhesh Kumar Gupta	-	1



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Time	Section	9.05 AM to 9.55 AM	10.05 AM to 10.55 AM	11.05 AM to 11.55 AM	12.05 PM to 12.55 PM		1.40 PM to 2.30 PM	02.50 PM to 3.40 PM	3.50 PM to 4.40 PM
Monday	Section I			Computational Statistics (21UCS1105) (Dr. Thirunavukkarasu)		Lunch (11.55 AM to 12.40 PM)		Leadership Development (BTech)	
Tuesday	Section I	IT in Management (Dr. Thirunavukkarasu)		Industry 4.0 (21UCS1107) (Dr. Thirunavukkarasu)					Computational Statistics (21UCS1105) (Dr. Thirunavukkarasu)
	Section II								
	Section III								



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Wednesday	Section I	Computational Statistics (21UCS1105) (Dr. Thirunavukkarasu)		IT in Management (Dr. Thirunavukkarasu)			Industry 4.0 (21UCS1107) (Dr. Thirunavukkarasu)		
	Section II								
Thursday	Section I	IT in Management (Dr. Thirunavukkarasu)			RIL (BTech)				Industry 4.0 (21UCS1107) (Dr. Thirunavukkarasu)
	Section III				RIL (Btech AI ML)				



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UNITEDWORLD SCHOOL OF COMPUTATIONAL INTELLIGENCE (USCI)

DEPARTMENT OF COMPUTER SCIENCE (DCS)

Student List – Industry 4.0

Admission ID	Student ID	Student Name	Program	Batch	Section	Email ID	Mobile No.
USCI0003	21BSAI01	Agrawal Aseem Harshadray	B.Sc	2021-24	BSc/FND/21/S1	Aseem21BSAI01@karnavatiuniversity.edu.in	9737928884
USCI0002	21BSCS01	Anshumitra Vyas	B.Sc	2021-24	BSc/FND/21/S1	Anshumitra21BSCS01@karnavatiuniversity.edu.in	9460289046
USCI0004	21BSAI02	Ayush Kantilal Jain	B.Sc	2021-24	BSc/FND/21/S1	Ayush21BSAI02@karnavatiuniversity.edu.in	7043365451
USCI0005	21BSCS02	Dev Thacker	B.Sc	2021-24	BSc/FND/21/S1	Dev21BSCS02@karnavatiuniversity.edu.in	9586686118
USCI0006	21BSDS01	Diksha Narang	B.Sc	2021-24	BSc/FND/21/S1	Diksha21BSDS01@karnavatiuniversity.edu.in	6280949017
USCI0017	21BSAI03	Gallani Mohit	B.Sc	2021-24	BSc/FND/21/S1	Mohit21BSAI03@karnavatiuniversity.edu.in	7284052883
USCI0007	21BSDS02	Harshvi Adesara	B.Sc	2021-24	BSc/FND/21/S1	Harshvi21BSDS02@karnavatiuniversity.edu.in	7847878878
USCI0008	21BSCS03	Jahnvi Mayur Machhi	B.Sc	2021-24	BSc/FND/21/S1	Jahnvi21BSCS03@karnavatiuniversity.edu.in	8208474484
USCI0009	21BSCS04	Janki Shah	B.Sc	2021-24	BSc/FND/21/S1	Janki21BSCS04@karnavatiuniversity.edu.in	7284053440
USCI0011	21BSDS03	Kajal Ramsahay Verma	B.Sc	2021-24	BSc/FND/21/S1	Kajal21BSDS03@karnavatiuniversity.edu.in	7433071422
USCI0010	21BSDS04	Kakadiya Jill RajanKumar	B.Sc	2021-24	BSc/FND/21/S1	Jill21BSDS04@karnavatiuniversity.edu.in	9510922182
USCI0001	21BSCS06	Kessani Aakash Mahesh	B.Sc	2021-24	BSc/FND/21/S1	Aakash21BSCS06@karnavatiuniversity.edu.in	9574137092
USCI0013	21BSDS05	Khushi Madia	B.Sc	2021-24	BSc/FND/21/S1	Khushi21BSDS05@karnavatiuniversity.edu.in	7434928565
USCI0014	21BSCS07	Kirti Ravi Advani	B.Sc	2021-24	BSc/FND/21/S1	Kirti21BSCS07@karnavatiuniversity.edu.in	8200429007
USCI0015	21BSDS06	Krutika Shiladitya Joshi	B.Sc	2021-24	BSc/FND/21/S1	Krutika21BSDS06@karnavatiuniversity.edu.in	9653447632
USCI0018	21BSAI04	Nikhil Anand	B.Sc	2021-24	BSc/FND/21/S1	Nikhil21BSAI04@karnavatiuniversity.edu.in	9974844667
USCI0020	21BSDS07	Nitya Shah	B.Sc	2021-24	BSc/FND/21/S1	Nitya21BSDS07@karnavatiuniversity.edu.in	8094002594



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USCI0023	21BSAI05	Palakshi Sinha	B.Sc	2021-24	BSc/FND/21/S1	Palakshi21BSAI05@karnavatiuniversity.edu.in	8849415814
USCI0012	21BSDL08	Patel Keya Ashish	B.Sc	2021-24	BSc/FND/21/S1	Keya21BSDL08@karnavatiuniversity.edu.in	7984974835
USCI0022	21BSAI06	Patel Om Arvindbhai	B.Sc	2021-24	BSc/FND/21/S1	Om21BSAI06@karnavatiuniversity.edu.in	8511136435
USCI0030	21BSCS08	Patel Shubh Kiran	B.Sc	2021-24	BSc/FND/21/S1	Shubh21BSCS08@karnavatiuniversity.edu.in	6355660407
USCI0035	21BSDL09	Patel Vishva Samirbhai	B.Sc	2021-24	BSc/FND/21/S1	Vishva21BSDL09@karnavatiuniversity.edu.in	6356140771
USCI0024	21BSAI07	Pranav Girish	B.Sc	2021-24	BSc/FND/21/S1	Pranav21BSAI07@karnavatiuniversity.edu.in	7600597801
USCI0025	21BSAI08	Prithvi Pratapsingh Vaghela	B.Sc	2021-24	BSc/FND/21/S1	Prithvi21BSAI08@karnavatiuniversity.edu.in	7984861133
USCI0026	21BSDL10	Pujita Sunnapu	B.Sc	2021-24	BSc/FND/21/S1	Pujita21BSDL10@karnavatiuniversity.edu.in	9426859090
USCI0117	21BSCS09	Rao Pooja Ashwinbhai	B.Sc	2021-24	BSc/FND/21/S1	Pooja21BSCS09@karnavatiuniversity.edu.in	7976719732
USCI0027	21BSCS10	Rohan Patil	B.Sc	2021-24	BSc/FND/21/S1	Rohan21BSCS10@karnavatiuniversity.edu.in	8347809620
USCI0028	21BSCS11	Rutu Girishkumar Patel	B.Sc	2021-24	BSc/FND/21/S1	Rutu21BSCS11@karnavatiuniversity.edu.in	9426321890
USCI0019	21BSCS12	Shah Nimai Alkesh	B.Sc	2021-24	BSc/FND/21/S1	Nimai21BSCS12@karnavatiuniversity.edu.in	8320451450
USCI0031	21BSAI09	Suhani P	B.Sc	2021-24	BSc/FND/21/S1	Suhani21BSAI09@karnavatiuniversity.edu.in	9150927689
USCI0032	21BSAI10	Suyash Pareek	B.Sc	2021-24	BSc/FND/21/S1	Suyash21BSAI10@karnavatiuniversity.edu.in	9521793770
USCI0033	21BSDL11	Tanya Chhabhadiya	B.Sc	2021-24	BSc/FND/21/S1	Tanya21BSDL11@karnavatiuniversity.edu.in	9510954271
USCI0029	21BSCS13	Vadhvani Sahil Anilkumar	B.Sc	2021-24	BSc/FND/21/S1	Sahil21BSCS13@karnavatiuniversity.edu.in	7984070438
USCI0036	21BSDL12	Yash Kamleshkumar Patel	B.Sc	2021-24	BSc/FND/21/S1	Yash21BSDL12@karnavatiuniversity.edu.in	7096302527
USCI0037	21BSDL13	Yash Paras Rayththa	B.Sc	2021-24	BSc/FND/21/S1	Yash21BSDL13@karnavatiuniversity.edu.in	7874972742
USCI0038	21BSDL14	Yatharth Shah	B.Sc	2021-24	BSc/FND/21/S1	Yatharth21BSDL14@karnavatiuniversity.edu.in	9328028512
USCI0039	21BSCS14	Zaeem MohmedNaeem Dola	B.Sc	2021-24	BSc/FND/21/S1	Zaeem21BSCS14@karnavatiuniversity.edu.in	9512673393



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Materials Used in Industry 4.0

UPLOADED ON ERP

Sample



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UNITEDWORLD SCHOOL OF COMPUTATIONAL INTELLIGENCE (USCI)

DEPARTMENT OF COMPUTER SCIENCE (DCS)

Mid Term Question Paper

UNITEDWORLD SCHOOL OF COMPUTATIONAL INTELLIGENCE (USCI)

UNIVERSITY EXAMINATIONS - MID-TERM - NOVEMBER 2021

B.Sc. (Hons.) (Computer Science)

(Common to B.Sc. (Hons.) CS-DS and B.Sc. (Hons.) CS-AIML)

FIRST SEMESTER (BATCH 2021)

Course Code: 21UCS1107

Course Title: Introduction to Industry 4.0

Duration: 1½ Hr.

Name of the Faculty: Dr Thirunavukkarasu K.

Max.: 50 Marks

PART A – (6 X 2 = 12 Marks)

Answer ALL the Questions.

1. Where started the first industrial revolution?
2. What was about Industry 2.0?
3. Define 'Cyber-Physical-Systems'
4. Distinguish between Intelligent Object vs Intelligent System
5. State smart factory.
6. Which products do you think have the largest potential meeting the demand in INDIA? Why?

PART B – (2 X 12 = 24 Marks)

Answer ALL the questions choosing either (a) or (b).

7. (a) (i) What are the business areas affected by industry 4.0? Explain them in detail.
(ii) Enhanced Productivity is just the beginning; Justify with an advantage.
OR
(b) (i) Impact of Industry 4.0 on People. Discuss your view.
(ii) Describe the important components of building 4.0.
8. (a) How do you believe that Industry 4.0 will affect the trend towards increasing automation? Explain in detail.
OR
(b) How would you consider the usability of machine to machine and Internet of Things (IoT) interface in your company?

PART C – (1 X 14 = 14 Marks)



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DEPARTMENT OF COMPUTER SCIENCE (DCS)

Answer Any ONE Question.

9. (a). State your opinion on i4.0 in India. Justify with your answers
(b). Sketch a neat diagram. Explain the potential impact of job automation over time across industry sectors?
10. (a). Illustrate framework of Industry 4.0 with diagram? Discuss on contributing technologies in detail.
(b). What is middle market manufacturer? How to implement Industry 4.0 effectively? in your organization? Design the roadmap for your organization. (Assumption: Choose interested sector of your choice)

Sample



PART A			PART B				PART C (HOT Questions)					
Q No	Attended (✓)	Mark	Q No	Attended (✓)	Mark			Q No	Attended (✓)	Mark		
					(a)	(b)	(c)			(a)	(b)	(c)
1	✓	2	11	87	6	6		21	89	10		
2		2	12	88		6		22				
3		2	13					23				
4		2	14					24				
5		2	15					25				
6		2	16					TOTAL		10		
7			17					GRAND TOTAL		<div>40</div> <div>(In Figures)</div>		
8			18									
9			19									
10			20									
TOTAL		12	TOTAL		6	12	4	Verified By		Dr. Sunil Jha		
19/1/2021 Date of Evaluation			Dr. Tinku K. Name of the Examiner					 Signature of the Examiner				




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 Part - A

Q Answer all the questions :-

A-1) The first industrial revolution started in late 1800s, and it was boom for industries.

→ Whereas it was industry 1.0 and over the years it has increased and upgraded and today it has reached level of 4.0.

→ Industry 4.0 was started coming in 2006 and originated in 2011 from a project in high-tech strategy of German Government.

→ Today, Industry 4.0 has grown and been on the revolution part of industries.

→ It is present in each and every sector of Economy.

A-2) → Industry 2.0 was about the ~~technology~~ technological revolution.

→ During Industry 2.0, all technological revolution was taking place in the country.

→ Industry 2.0 was a successful revolution for technological sector.

→ Industry 2.0 was replaced and succeed by Industry 3.0.

→ Thus, the above is what was about Industry 2.0.



PART A			PART B				PART C (HOT Questions)					
Q No	Attended (√)	Mark	Q No	Attended (√)	Mark			Q No	Attended (√)	Mark		
					(a)	(b)	(c)			(a)	(b)	(c)
1		2	11	07	6	6		21	9			
2		2	12	08	5			22	10	7	6	
3		2	13					23				
4		2	14					24				
5		1	15					25				
6		2	16					TOTAL		07	06	
7			17					GRAND TOTAL		41 41		
8			18							(In Figures)		
9			19							Forty-one		
10			20							(In Words)		
TOTAL		11	TOTAL		11	6		Verified By		Dr. Sunil Shor		
29/2/2021			Dr. Minu K.									
Date of Evaluation			Name of the Examiner					Signature of the Examiner				



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KARNAVATI UNIVERSITY

UNITEDWORLD SCHOOL OF COMPUTATIONAL INTELLIGENCE

UNIVERSITY EXAMINATIONS - MID-TERM - NOVEMBER 2021

AWARD SHEET

Program :B.Sc.(Hons)-CS/CS-DS/CS-AI-ML				Semester:I(Sep21-Jan22)						Name of Faculty:Dr. Thirunavukkarasu K				
Course Code:21UCS1107				Course Name:Introduction to Industry 4.0									Batch: 2021-2024	
S.No	Admission ID	Student ID	Student Name	Q1(2)	Q2(2)	Q3(2)	Q4(2)	Q5(2)	Q6(2)	Q7(12)	Q8(12)	Q9 or Q10(14)	Total Marks (50)	
1	USCI0003	21BSAI01	Agrawal Aseem Harshadray	2	2	2	2	2	2	6	6	13	37	
2	USCI0002	21BSCS01	Anshumitra Vyas	1	1	0	0	1	1	9	0	7	20	
3	USCI0004	21BSAI02	Ayush Kantilal Jain	2	2	2	2	1	2	12	5	13	41	
4	USCI0005	21BSCS02	Dev Thacker	1	1	2	2	2	2	10	6	12	38	
5	USCI0006	21BSDS01	Diksha Narang	2	2	2	2	2	0	12	6	11	39	
6	USCI0017	21BSAI03	Gallani Mohit Nareshkumar	2	2	2	0	2	1	6	1	12	28	
7	USCI0007	21BSDS02	Harshvi Adesara										AB	
8	USCI0008	21BSCS03	Jahnavi Mayur Machhi										AB	
9	USCI0009	21BSCS04	Janki Shah										AB	
10	USCI0011	21BSDS03	Kajal Ramsahay Verma	2	2	2	2	2	2	5	0	8	25	
11	USCI0010	21BSDS04	Kakadiya Jill RajanKumar	2	2	2	2	2	2	6	2	3	23	



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12	USCI00 01	21BSCS 06	Kessani Aakash Mahesh	2	2	2	2	2	2	12	6	10	40
13	USCI00 13	21BSDS 05	Khushi Madia	0	0	0	2	2	2	12	3	13	34
14	USCI00 14	21BSCS 07	Kirti Ravi Advani	2	2	2	2	2	2	4	4	0	20
15	USCI00 15	21BSDS 06	Krutika Shiladitya Joshi	1	2	2	2	2	0	6	0	7	22
16	USCI00 18	21BSAI 04	Nikhil Anand	2	2	2	0	2	0	0	7	0	15
17	USCI00 20	21BSDS 07	Nitya Shah	0	0	2	2	2	0	0	0	0	6
18	USCI00 23	21BSAI 05	Palakshi Sinha	2	2	2	2	2	1	10	5	14	40
19	USCI00 12	21BSDS 08	Patel Keya Ashish	1	2	2	0	2	0	6	2	6	21
20	USCI00 22	21BSAI 06	Patel Om Arvindbhai	2	2	2	2	2	2	10	4	0	26
21	USCI00 30	21BSCS 08	Patel Shubh Kiran	1	1	0	1	2	0	4	3	1	13
22	USCI00 35	21BSDS 09	Patel Vishva Samirbhai	0	1	0	2	2	2	6	6	7	26
23	USCI00 24	21BSAI 07	Pranav Girish	1	2	2	2	2	2	6	5	13	35
24	USCI00 25	21BSAI 08	Prithvi Pratapsingh Vaghela	1	1	2	2	2	0	6	6	1	21
25	USCI00 26	21BSDS 10	Pujita Sunnapu	1	0	0	0	2	0	4	0	2	9
26	USCI01 17	21BSCS 09	Rao Pooja Ashwinbhai	0	0	2	2	2	0	8	0	6	20
27	USCI00 27	21BSCS 10	Rohan Patil										AB
28	USCI00 28	21BSCS 11	Rutu Girishkumar Patel	2	1	0	0	2	2	6	3	0	16
29	USCI00 31	21BSAI 09	Suhani P	1	1	1	0	2	2	9	2	13	31
30	USCI00 32	21BSAI 10	Suyash Pareek	0	2	2	2	2	2	5	2	4	21

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**UNITEDWORLD SCHOOL OF COMPUTATIONAL INTELLIGENCE (USCI)**

	Name of Faculty:Dr. Thirunavukkarasu K												School Examcell Coordinator	
						(Dr Raju Shanmugam)								

Mid Term Examination	Learners	Slow Learners		Medium Learners		Fast Learners
	Range of Marks	0-10	11-20	21-30	31-40	41-50
	No.of Students	2	8	10	11	1

S.No	Admission ID	Student ID	Student Name
2	USCI0002	21BSCS01	Anshumitra Vyas
14	USCI0014	21BSCS07	Kirti Ravi Advani
16	USCI0018	21BSAI04	Nikhil Anand
17	USCI0020	21BSDS07	Nitya Shah
21	USCI0030	21BSCS08	Patel Shubh Kiran
25	USCI0026	21BSDS10	Pujita Sunnapu
26	USCI0117	21BSCS09	Rao Pooja Ashwinbhai
28	USCI0028	21BSCS11	Rutu Girishkumar Patel
32	USCI0029	21BSCS13	Vadhyani Sahil Anilkumar
35	USCI0038	21BSDS14	Yatharth Shah



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Remedial Measures for Slow Learners:

- (a) Additional Materials
- (b) Special and extra class
- (c) Additional Assignments
- (d) Re-test

Sample



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DEPARTMENT OF COMPUTER SCIENCE (DCS)

End Term Examinations (ETE)

Question papers

Sample