



## MINOR DEGREE STRUCTURE

**Offered by Department of SRM Innovation and Design Centre (SIDC)**

**Minor in Design and Innovation**

SRM Innovation and Design Centre (SIDC) transforms our day-to-day lives through a multitude of innovative technologies and products. The SIDC minor is intended to expose students from other disciplines to the unlimited opportunities for innovation in this exciting field, and to the methodologies and tools used by SIDC engineers for the exploration and design of new technologies and products. The program is expected to accommodate students of diverse backgrounds.

- An **academic major** is the academic discipline to which an undergraduate student formally commits. A student who successfully completes all courses required for the major qualifies for an undergraduate degree.
- **Academic minor** is an academic discipline outside of the student's academic major in which he or she takes a small number of classes.
- An academic major or major field refers to a student's primary focus within their degree program while a minor or minor field refers to his or her secondary focus.
- **Minors are optional.** You may complete multiple minors or none at all.
- Some students will prepare for their intended career with their major, while pursuing personal interests with a minor, for example, majoring in SIDC while minoring in a foreign language or performing arts or Economics or Management Studies. Other students may pursue a minor to provide specific specialization and thus make themselves more attractive to employers.

### **Why Choose a Minor?**

- Adding depth to your studies
- Adding breadth to your studies
- An area of passion
- An alternative to double majoring

### **Objectives of this minor program**

1. To impart to students basic fundamental and applied knowledge in the SIDC discipline.
2. To convey an understanding of the continuously increasing contributions of SIDC to society.
3. To obtain a working knowledge of core SIDC principles.
4. To understand the current state-of-the-art within the SIDC discipline, and to bridge between their major discipline of study and that of SIDC.

### **Minors: Rules and Regulations**

1. Pursuing a major/minor program is a highly individual decision, and should be based on a student's educational and career goals.
2. Minors must be completed simultaneously with a major degree program. You cannot earn a minor after you have already earned your bachelor's degree(s).
3. You need at least one active major in order to pursue a minor.
4. Also be aware that since the minor must be completed with a major, any outstanding minor requirements will prevent the awarding of the degree for your major. If you ultimately decide to graduate without the minor, the minor must be removed from your records before your degree can be processed.
5. The Certification for Minor will NOT be issued until the Major degree is successfully completed, even though all requirements for the Minor have been satisfied.
6. All requirements for the Minor must be completed within a maximum of ONE semester of the completion of the Major degree but NOT LATER THAN the maximum duration of study of the Major degree permitted by UGC i.e., not more than N+2 years where 'N' is the normal duration of study as per regulations.
7. If a student drops from a Minor or is NOT able to fulfil all the requirements for the certification of Minor, within the maximum period of study permitted by UGC, the student will NOT be issued the Certification. Nevertheless, the transcripts for the completed courses will be issued.
8. Courses offered for a Certification in Minor will be treated on par with the regular courses of a Major in respect of attendance requirements, assessment and examination requirements.
9. The number of seats for minor in SIDC is limited and subject to availability and academic performance.
10. Register for a Minor any time after 3rd Semester of B.Tech
11. The offering Department scrutinises the credentials of registered students and announces the list of selected students who fulfil the minimum eligibility criteria for admission into a Minor Certificate programme.
12. The selected students enrol into the Minor Certificate programme by paying a one-time programme fee of Rs. 75,000/- that includes the tuition fee, examination fee and fee for transcript and certificate.
13. The student is permitted to register for a maximum of 2 courses per semester, over and above the maximum credits permitted (26 credits) for a Major degree of study.
14. A minor requires 18-20 credits to be acquired from the courses offered by the Dept. of SIDC.

### **Eligibility Criteria**

A student will be permitted to pursue a Minor, if and only if, he / she fulfils the following criteria:

- i. Must have secured a minimum of 7.0 CGPA\* at the time of admission to a Minor
- ii. There must NOT be any standing arrears / Backlogs.
- iii. Must be in the active rolls of the department without any break of study or disciplinary action pending against the student
- iv. Must have NO outstanding fee dues

\* CGPA cut off is subject to change based on the demand and competition.

## MINOR IN DESIGN AND INNOVATION

Category	Course Code	Course Title	L	T	P	C	Pre-Requisite	Credits to be earned
Core	18DCC001J	Design Thinking and Methodology	2	0	4	4		4
	18DCC002J	Technology Entrepreneurship	2	0	4	4		4
	18DCC003J	Technology Design Foundation	2	0	4	4		4
	18DCC004T	Seminar on Design Innovation	0	2	0	1		1
	18DCC005L	Challenge Project on Product Prototyping	0	0	12	6		6
Total Credits								19

Course Code	18DCC001J	Course Name	Design Thinking and Methodology	Course Category	C	Minor	L	I	P	C
							2	0	4	4

Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil
Course Offering Department		SRM Innovation and Design Center	Data Book / Codes/Standards	Nil	

Course Learning Rationale (CLR):		The purpose of learning this course is to:	Learning		
			1	2	3
CLR-1:	Designed to explores mindset, skill set and toolset associated with design		Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)
CLR-2:	Designed to work with guided applications to framing and solving problems from the perspectives of both business and engineering writing				
CLR-3:	Exposing students diverging to generate solutions and converging to select among them				
CLR-4:	Design methods to create concept generation methods, concept selection methods, imagining alternative futures				
CLR-5:	Understand the basics of Satellite Communication				
Course Learning Outcomes (CLO):		At the end of this course, learners will be able to:			
CLO-1:	Students will be able to learn and understand technology design concepts		1	80	85
CLO-2:	Students will be able to learning mindset, skillset and toolset associated with design		2	75	80
CLO-3:	Students will be able to identify the best solutions and converging to select among them.		2	85	80
CLO-4:	Students will be able to understand concept generation methods, concept selection methods, imagining alternative futures		2	80	75

Program Learning Outcomes (PLO)														
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Engineering Knowledge	Problem Analysis	Design & Development	Analysis, Design, Research	Modern Tool Usage	Society & Culture	Environment & Sustainability	Ethics	Individual & Team Work	Communication	Project Mgt. & Finance	Life Long Learning	PSO-1	PSO-2	PSO-3
H	-	-	-	-	-	-	H	-	-	-	-	-	-	-
H	H	-	-	H	-	-	H	-	-	H	-	-	-	-
H	-	-	H	-	-	-	H	-	-	-	-	-	-	-
H	H	-	-	H	-	-	-	-	-	-	-	-	-	-

Duration (hour)		6	6	6	6	6
S-1	SLO-1	Introduction to Design Methodology	Prototyping	User Assessment	Value Proposition Design	Business Model
	SLO-2					
S-2	SLO-1	Design Frameworks	Prototyping Planning	Usability Test	Value Proposition Design and Mapping,	Business Model Canvas
	SLO-2					
S-3	SLO-1	Engineering Design Problem Solving	Concept Refinement and Storyboard	Understanding Users	Prototyping & Competitor Study	Business pitch
	SLO-2					
S-4	SLO-1	Developing Design Solutions	Envisioning Future	Learning about Customer	Competitors / Complementors's Map	Pitching strategies
	SLO-2					
S-5	SLO-1	Making Design Solutions	Conceptual design	Clustering & Abstract Laddering	Design Methodologies	IP and Partnerships
	SLO-2					
S-6	SLO-1	Evaluating Design Solutions	Creative Matrix, Morphological Synthesis, Concept Poster	User Testing	Capital Budgeting: Risk Analysis with Scenarios	Forecasting Financial Statements
	SLO-2					
S-7	SLO-1	Project Introduction and Team formation	Basic Presentation	Project Discussion with Teaching Team	Project Discussion with Teaching Team	Project Discussion with Teaching Team
	SLO-2					
S-8	SLO-1	Stakeholder Map	Project Discussion with Teaching Team	Project Discussion with Teaching Team	Project Mini-showcase	Final Project Presentation
	SLO-2					
S-9	SLO-1	Brainstorming	Usability Test Demo	Project Discussion with Teaching Team	Project Discussion with Teaching Team	Design Showcase
	SLO-2					

Learning Resources	1. Foundations of Engineering & Technology, 7th Edition by Dr. R. Thomas Wright, Dr. Greg J. Strimel, and Dr. Michael E. Grubbs	2. Innovation Engineering; a practical guide to creating anything new by Ikhlaqsidhu
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	Bloom's Level of Thinking	Continuous Learning Assessment (100% weightage)							
		CLA – 1 (25%)		CLA – 2 (25%)		CLA – 3 (20%)		CLA – 4 (30%)	
		Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice
Level 1	Remember Understand	20 %	-	20 %	-	-	20 %	-	20 %
Level 2	Apply Analyze	40 %	-	40 %	-	-	40 %	-	40 %
Level 3	Evaluate Create	40 %	-	40 %	-	-	40 %	-	40 %
	Total	100 %		100 %		100 %		100 %	

Course Code	18DCC002J	Course Name	TECHNOLOGY ENTREPRENEURSHIP		Course Category	C	Minor		L	T	P	C
									2	0	4	4

Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil
Course Offering Department	SRM Innovation and Design Center		Data Book / Codes/Standards	Nil	

Course Learning Rationale (CLR):		<i>The purpose of learning this course is to:</i>			Learning			Program Learning Outcomes (PLO)														
CLR-1 :	Designed to explore key entrepreneurial concepts relevant to the high-technology world				1	2	3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
CLR-2 :	Designed to work with entrepreneurial perspective, start-up strategies, business idea evaluation, business plan writing				Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)	Engineering Knowledge	Problem Analysis	Design & Development Analysis, Design, Research	Modern Tool Usage	Society & Culture Environment & Sustainability	Ethics	Individual & Team Work	Communication	Project Mgt. & Finance	Life Long Learning	PSO-1	PSO-2	PSO- 3		
CLR-3 :	Exposing students technical and business minded students for careers focused on entrepreneurship																					
CLR-4 :	Design methods to create intensive study of actual business situations through rigorous case-study analysis																					
CLR-5 :	Understand the basics of Satellite Communication																					
CLR-6 :																						
Course Learning Outcomes (CLO):		<i>At the end of this course, learners will be able to:</i>																				
CLO-1 :	Students will be able to learn and understand entrepreneurial concepts				1	80	85	H	-	-	-	-	-	H	-	-	-	-	-	-	-	-
CLO-2 :	Students will be able to catalyze learning through start-up strategies, business idea evaluation, business plan				2	75	80	H	H	-	-	H	-	H	-	-	H	-	-	-	-	-
CLO-3 :	Students will be able to identify the best role for themselves within an entrepreneurial organization.				2	85	80	H	-	-	H	-	-	H	-	-	-	-	-	-	-	-
CLO-4 :	Students will be able to understand the entrepreneurial context, and how it can create better outcomes.				2	80	75	H	H	-	-	H	-	-	-	-	-	-	-	-	-	-

Duration (hour)		6	6	6	6	6
S-1	SLO-1 SLO-2	Entrepreneurial Mindset	Marketing Strategy, Message and Campaigns	Business Models, Revenue Models	Financial Modeling & Estimating Financial Needs	How to Pitch, Valuation and Investor Mindset
S-2	SLO-1 SLO-2	Problem- Identification	Key Metrics That Drive a Business	Go-to-Market Strategies	Analysis of Financial Statements	Pitching strategies
S-3	SLO-1 SLO-2	Customer Discovery	Developing your marketing strategy	Channels & Sales	Forecasting Annual Revenues	Value assessment methods
S-4	SLO-1 SLO-2	Customer Value Proposition	Presenting your marketing strategy	IP and Partnerships	Forecasting Financial Statements	Investor discovery
S-5	SLO-1 SLO-2	Problem-Solution Fit	Target audience discovery	Estimates	Profit, Break Even, and Leverage	Venture capital and angel investors mindsets
S-6	SLO-1 SLO-2	Product-Market Fit	Social media and digital marketing	Business-model-canvas	Capital Budgeting: Risk Analysis with Scenarios	Creating a good venture presentation
S-7	SLO-1 SLO-2	Project Introduction and Team formation	Customer Validation	Improve product based on input and feedback in gate 1	Project Development	Project Development
S-8	SLO-1 SLO-2	Creation of blog	Project Development	Project Development	Gate 2 presentations. IP and Partnerships	Dress Rehearsals with Internal Critique
S-9	SLO-1 SLO-2	Basic Presentation	Gate 1 presentations. Product-Market Fit	Project Development	Project Development	Final Demo – Project Evaluation

Learning Resources	1. Entrepreneurship for Everyone: A Student Textbook by Robert Mello	2. Innovation Engineering ; a practical guide to creating anything new by ikhlaqidhu
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	Bloom's Level of Thinking	Continuous Learning Assessment (100% weightage)							
		CLA – 1 (25%)		CLA – 2 (25%)		CLA – 3 (20%)		CLA – 4 (30%)	
		Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice
Level 1	Remember	20 %	-	20 %	-	-	20 %	-	20 %
	Understand								
Level 2	Apply	40 %	-	40 %	-	-	40 %	-	40 %
	Analyze								
Level 3	Evaluate	40 %	-	40 %	-	-	40 %	-	40 %
	Create								
	Total	100 %		100 %		100 %		100 %	

Course Code	18DCC003J	Course Name	TECHNOLOGY DESIGN FOUNDATION	Course Category	E	Minor	L	I	P	C
							2	0	4	4

Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil
Course Offering Department		SRM Innovation and Incubation Center		Data Book / Codes/Standards	

Course Learning Rationale (CLR):		The purpose of learning this course is to:		Learning			Program Learning Outcomes (PLO)															
				1	2	3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
CLR-1:	Designed to	explores	mindset, skill set and toolset associated with design	Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)	Engineering Knowledge	Problem Analysis	Design & Development Analysis, Design, Research	Modern Tool Usage	Society & Culture Environment & Sustainability	Ethics	Individual & Team Work	Communication	Project Mgt & Finance	Life Long Learning	PSO-1	PSO-2	PSO-3			
CLR-2:	Designed to work with	guided applications to framing and solving problems from the perspectives of both business and engineering writing	H				-	-	-	-	-	H	-	-	-	-	-	H	-	-	-	-
CLR-3:	Exposing students	diverging to generate solutions and converging to select among them	H				H	-	H	-	-	H	-	-	H	-	-	-	-	-	-	-
CLR-4:	Design methods to create	concept generation methods, concept selection methods, imagining alternative futures	H				-	H	-	-	-	H	-	-	-	-	-	-	-	-	-	-
Course Learning Outcomes (CLO):		At the end of this course, learners will be able to:		1	80	85	H	-	-	-	-	-	H	-	-	-	-	-	-	-		
CLO-1:	Students will be able to learn and understand technology design concepts	2	75	80	H	H	-	-	H	-	-	H	-	-	H	-	-	-	-			
CLO-2:	Students will be able to learning mindset, skillset and toolset associated with design	2	85	80	H	-	-	H	-	-	-	H	-	-	-	-	-	-	-			
CLO-3:	Students will be able to identify the best solutions and converging to select among them.	2	80	75	H	H	-	-	H	-	-	-	-	-	-	-	-	-	-			
CLO-4:	Students will be able to understand concept generation methods, concept selection methods, imagining alternative futures	2	80	75	H	H	-	-	H	-	-	-	-	-	-	-	-	-	-			

Duration (hour)	6	6	6	6	6
S-1	SLO-1 SLO-2	Introduction to Design Methodology	Prototyping	User Assessment	Value Proposition Design
S-2	SLO-1 SLO-2	Design Frameworks	Prototyping Planning	Usability Test	Value Proposition Design and Mapping, Business Model Canvas
S-3	SLO-1 SLO-2	Engineering Design Problem Solving	Concept Refinement and Storyboard	Understanding Users	Prototyping & Competitor Study, Business pitch
S-4	SLO-1 SLO-2	Developing Design Solutions	Envisioning Future	Learning about Customer	Competitors/ Complementors Map, Pitching strategies
S-5	SLO-1 SLO-2	Making Design Solutions	Conceptual design	Clustering & Abstract Laddering	Design Methodologies, IP and Partnerships
S-6	SLO-1 SLO-2	Evaluating Design Solutions	Creative Matrix, Morphological Synthesis, Concept Poster	User Testing	Capital Budgeting: Risk Analysis with Scenarios, Forecasting Financial Statements
S-7	SLO-1 SLO-2	Project Introduction and Team formation	Basic Presentation	Project Discussion with Teaching Team	Project Discussion with Teaching Team
S-8	SLO-1 SLO-2	Stakeholder Map	Project Discussion with Teaching Team	Project Discussion with Teaching Team	Project Mini-showcase, Final Project Presentation
S-9	SLO-1 SLO-2	Brainstorming	Usability Test Demo	Project Discussion with Teaching Team	Project Discussion with Teaching Team, Design Showcase

Learning Resources	3. Foundations of Engineering & Technology, 7th Edition by Dr. R. Thomas Wright, Dr. Greg J. Strimel, and Dr. Michael E. Grubbs	4. Innovation Engineering ; a practical guide to creating anything new by ikhlaqsidhu
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	Bloom's Level of Thinking	Continuous Learning Assessment (100% weightage)							
		CLA – 1 (25%)		CLA – 2 (25%)		CLA – 3 (20%)		CLA – 4 (30%)	
		Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice
Level 1	Remember Understand	40 %	-	30 %	-	-	30 %	-	30 %
Level 2	Apply Analyze	40 %	-	40 %	-	-	40 %	-	40 %
Level 3	Evaluate Create	20 %	-	30 %	-	-	30 %	-	30 %
	Total	100 %		100 %		100 %		100 %	

<b>Course Code</b>	<b>18DCC004T</b>	<b>Course Name</b>	<b>Seminar on Design Innovation</b>	<b>Course Category</b>	C	<i>Minor</i>	L	T	P	C
							0	2	0	1

<b>Pre-requisite Courses</b>	Nil	<b>Co-requisite Courses</b>	Nil	<b>Progressive Courses</b>	Nil
<b>Course Offering Department</b>	SRM Innovation and Incubation Center	<b>Data Book / Codes/Standards</b>	Nil		

Course Learning Rationale (CLR):		The purpose of learning this course is to:	Learning		
			1	2	3
CLR-1 :	This lecture series exposes students to a diverse range of leaders, innovators, and concepts in design innovation.		Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)
CLR-2 :	Students will learn from speakers, who will share their insights, practices, and projects from working at the intersections of design and technology innovation.				
Course Learning Outcomes (CLO):		At the end of this course, learners will be able to:	Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)
CLO-1 :	Students will be able to gain knowledge on Innovation		100	80	85

Program Learning Outcomes (PLO)														
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
H	-	-	-	-	-	-	H	-	-	-	-	-	-	-
Engineering Knowledge	Problem Analysis	Design & Development Analysis, Design Research	Modern Tool Usage	Society & Culture	Environment & Sustainability	Ethics	Individual & Team Work	Communication	Project Mgt. & Finance	Lifelong Learning	PSO-1	PSO-2	PSO-3	

- ☐ In this students will attend the speaker series, which features local design practitioners who share real-world stories about their projects, practices, and perspectives.
- ☐ Talks are scheduled during the semester; during any off weeks, students will engage in facilitated discussions.
- ☐ Students should attend Minimum 5 Lectures/talk and submit the reflex on the lectures/talk.

#### Learning Assessment

Students will be provided 10% of marks on attending each lecture and 15% of the marks for the reflex they submit for the lectures

Course Code	18DCC005L	Course Name	CHALLENGE PROJECT ON PRODUCT PROTOTYPING	Course Category	C	Minor	L	T	P	C
							0	0	12	6

Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil
Course Offering Department	SRM Innovation and Incubation Center			Data Book / Codes/Standards	Nil

<b>Course Learning Rationale (CLR):</b>		<i>The purpose of learning this course is to:</i>			<b>Learning</b>			<b>Program Learning Outcomes (PLO)</b>																
<b>CLR-1:</b>	<i>To prepare the student to gain major design and or research experience as applicable to the profession</i>				1	2	3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		
<b>CLR-2:</b>	<i>Carry out the projects within multiple design constraints and engineering writing</i>				Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)	Engineering Knowledge	Problem Analysis	Design & Development	Analysis, Design, Research	Modern Tool Usage	Society & Culture	Environment & Sustainability	Ethics	Individual & Team Work	Communication	Project Mgt & Finance	Lifelong Learning	PSO-1	PSO-2	PSO- 3		
<b>CLR-3:</b>	<i>Incorporate multidisciplinary components</i>							H	-	-	-	-	-	-	H	-	-	-	-	-	-	-	-	-
<b>CLR-4:</b>	<i>Carry out the Product Prototyping</i>																							
<b>Course Learning Outcomes (CLO):</b>		<i>At the end of this course, learners will be able to:</i>																						
<b>CLO-1:</b>	<i>Students will be able to design a product prototype</i>				100	80	85																	

Learning Assessment					
Continuous Learning Assessment		Assessment tool	Review I	Review II	Review III
		Weightage	5%	20%	25%
Final Evaluation		Assessment tool	Project Report	Viva Voce *	Total
		Weightage	20%	30%	50%