



# CLIMATE RESPONSIVE DESIGN

ANALYTICAL TECHNIQUES, SOFTWARE TOOLS AND COMMUNICATION SKILLS

*Image Credit: IIT Jodhpur by SHiFt*

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**A 3-week online certificate program to learn analytical techniques, software tools and communication skills with clarity of fundamentals to design a climate responsive building**

**27<sup>th</sup> April 2020 – 18<sup>th</sup> May 2020**

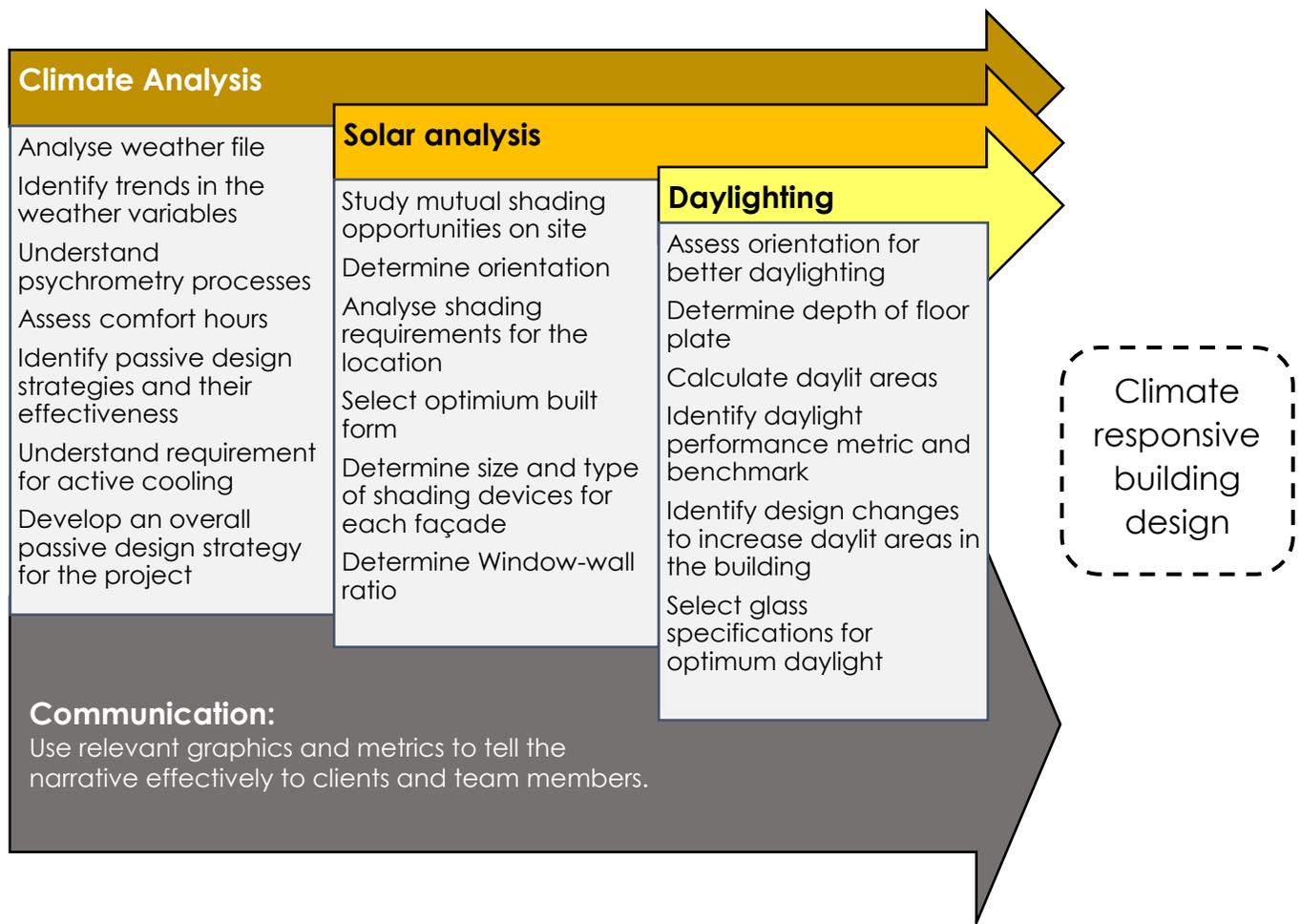
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## Program brief:

Climate responsive design is the fundamental approach to achieving a sustainable built environment. One of the important functions of a building is to provide comfort for occupants. Good buildings do this using as less energy as possible. Good buildings are designed in response to climate and sun. In such buildings, the overall size of air-conditioning system is smaller and this in turn helps reduce the total energy use compared to conventional buildings. Moreover, this approach results in architecture that is contextual and appropriate for the environment.

It is especially important to get the direction right during concept stage when most design opportunities can be assessed and integrated. The steps in a climate responsive design process is as follows.



While the core fundamentals are based on science, the application of concepts in contemporary building design is different. This requires a new skill set of analytical thinking, software tools, design performance validation and presentation. Further, it is equally important to communicate your ideas to the client or team members in an effective way. Knowing which

metrics to use and selecting the right visuals to tell the story is an essential skill that will move the needle forward and get client to take decisions.

**This certificate course will empower you with skills and knowledge to identify, design, recommend strategies and communicate effectively about climate responsive design.**

The theoretical concepts covered in the courses will be taught in a simple and relatable manner with practical examples. Practical tips for The capstone project in this program will give participants the opportunity to apply the concepts on a sample design project. Alternately, students can also execute the same exercise on their design project.

### **Learning objectives:**

1. Refresh passive solar design fundamentals and technical concepts
2. Identify passive design strategies applicable to the project location
3. Learn software skills to execute technical analysis during concept design stage
4. Validate design decisions using analytical techniques
5. Communicate your ideas effectively to client and team members
6. Practical application of concepts for contemporary design
7. Explain technical terms pertaining to climate, psychrometry, solar geometry and daylighting

### **This program is designed for:**

- Any professional involved in designing buildings
- Architects, green building consultants
- Students studying architecture or related discipline (4th year and beyond)
- Faculty teaching architecture or related discipline

### **Program format:**

This training program is **completely online** offering flexibility to participants. It is designed in a blended learning format; which means it combines live webinar sessions with online on-demand courses along with assignments and project. **Participants can attend the webinar from any location.**

**The program includes 6 course modules and 1 capstone project which allows practical application of theoretical concepts.** The webinar will introduce concepts and demonstrate software tools with application in detail. Access to self-paced pre-recorded online course modules will be given for additional reading that can be completed as per the individual's pace. Weekly assignments will help participants understand software tools in detail and its application in design. The concepts covered in the program will culminate in the capstone project which includes a sample project for which climate responsive design strategies

have to be identified. Participants will work on one section of the capstone project each week and carry it forward to develop a comprehensive report by end of the program. Participants can also take up a design project/building of their choice to work on the exercise as enumerated in the capstone project.

**This engaging and immersive program includes 15 hours of e-learning and 16 hours of assignment time comfortably spread over 3 weeks.**

The format is as follows:

- 1 webinar will be conducted each week as per the detailed schedule
- Assignment given after each webinar which should be submitted in that week.
- Online self-paced course modules on various topics will be introduced each week as per the schedule for further reading. While these modules can be taken at own's pace, it is recommended that they are complete in that week for most effective learning experience. Each course module has a quiz to assess learning outcomes.
- The design problem for the Capstone project will be introduced every week correlating it to the topics covered in that week. Participants can apply this exercise on their individual studio design project, or the sample project given in this program. Progress has to be submitted every week and the final consolidated report is to be submitted at the end of the program.

#### **Program takeaways:**

- Develop a comprehensive 'Climate Responsive Report' for your project
- Know-how of 6 free software tools and analytical technique
- Copy of all training materials
- Lifetime access to online courses
- Feedback on assignments
- Interaction with expert faculty to answer your queries
- Certificate on completing the capstone project
- Continuing Education (CE) hours of 6 credits from USGBC on completing the self-paced courses

**Program Fee: INR 7,500 per person**

**Link to register: <https://bit.ly/2FK74hr>**

**For any queries, write to: [education@edsglobal.com](mailto:education@edsglobal.com)**

#### **Testimonials:**

"After completing this course, I feel more confident in orienting exercises that are more technical and application based, involves graphical as well as computer-based methods of analysis. Modules were well structured having excellent content and assignments that build on your knowledge, reinforce and then expand" - ARCHANA

"Excellent presentations and inspiring lectures!" - PETER

"Beautifully designed course.. Excellent trainers.. excellent assignments & project" -

"Overall, I have greatly benefited from the course" - BRINDA

"Very insightful and blends concepts really well" - MAITREYEE

## Program Schedule:

Week 1				
Date	Format/ time (IST)	Duration	Session topic	Assignment
Monday, 27 <sup>th</sup> April	Webinar 6:00pm – 7:30pm	1.5 hours	<b>ORIENTATION</b> <ul style="list-style-type: none"> <li>Program introduction</li> <li>What to expect</li> <li>Format and schedule</li> <li>Meet your classmates</li> </ul>	
Wednesday, 29 <sup>th</sup> April	Webinar 6:00pm – 9:00pm	1 hour	<b>MODULE – 1: Climate analysis - I</b> <ul style="list-style-type: none"> <li>Relevance of climate analysis today</li> <li>Correlation of global climate zones with solar movement</li> <li>Tools to analyze and visualize weather data</li> </ul>	Assignment – 1.1  (Time estimate: 2 hours)
		1 hour	<b>MODULE – 2: Climate analysis - II</b> <ul style="list-style-type: none"> <li>Use bioclimatic chart tool for identifying passive design strategies</li> <li>Use Psychrometry tool to understand climate response</li> <li>Demo - Climate Consultant software for analysis</li> </ul>	Atleast 1 hour of working session with software is recommended for a good understanding.
		30 mins	<b>MODULE-3: Communications – I</b> <ul style="list-style-type: none"> <li>Understanding the audience</li> <li>Demystifying technical language</li> <li>Common challenges</li> </ul>	
		30 mins	<b><u>QnA session</u></b>  <b><u>Capstone project</u></b> Webinar will introduce the project for Week-1: 'Climate Analysis Report'. Participants will work on the project at their own time.  <b><u>Key outcomes:</u></b> <ul style="list-style-type: none"> <li>Develop a climate analysis report for your project</li> <li>List key passive design strategies</li> </ul>	Time estimate for Capstone project – Week1: 3 hours
<b>Sunday, 3<sup>rd</sup> May</b>	<b>Week 1 Assignment submission</b> <b>Week-1 Capstone project submission</b>			
<b>ONLINE COURSES FOR FURTHER READING</b>				

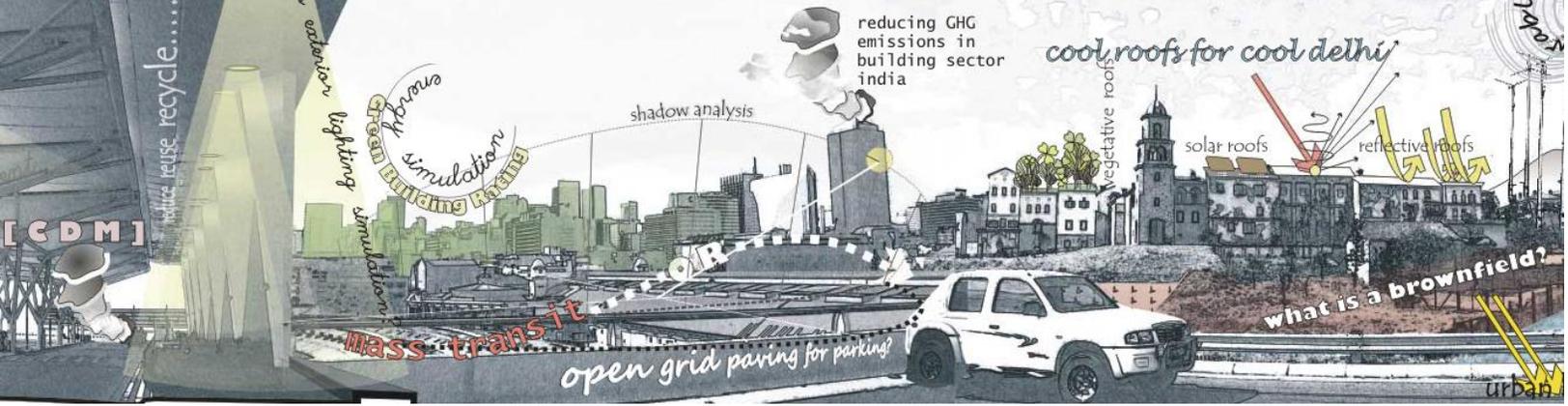
	Online course	1.5 hour	<b>Understanding Climate</b> <ul style="list-style-type: none"> <li>Recognize different global climate zones</li> <li>Identify climate variables</li> </ul>	Online quiz
	Online course	1 hour	<b>Psychrometry for green buildings</b> <ul style="list-style-type: none"> <li>Clarity of psychrometry principles and its correlation with climate variables</li> <li>Understand how psychrometry process informs application of passive design strategies</li> </ul>	Online quiz
<b>Week 2</b>				
<b>Date</b>	<b>Format/time (IST)</b>	<b>Duration</b>	<b>Session topic</b>	<b>Assignment</b>
Wednesday, 6 <sup>th</sup> May	Webinar 6:00pm – 9:00pm	1 hour	<b>MODULE – 4: Solar analysis</b> <ul style="list-style-type: none"> <li>Online tool for sunpath diagrams</li> <li>Online tool for generating shadow mask diagrams</li> <li>Demo – Shading Analysis tool</li> </ul>	Assignment – 2.1  (Time estimate: 2 hours)
		1 hour	<b>MODULE – 5: Shading Design</b> <ul style="list-style-type: none"> <li>Identify shading requirements</li> <li>Determine size and type of shading devices</li> <li>Demo of Solar2</li> </ul>	
		30 mins	<b>MODULE-6: Communications – II</b> <ul style="list-style-type: none"> <li>Early design communication</li> <li>Understanding your role</li> <li>Getting the point across</li> </ul>	
		30 mins	<u><b>QnA session</b></u>  <u><b>Capstone project</b></u> Webinar will introduce the project for Week-2: 'Solar Analysis Report'. Participants will work on the project at their own time.  <u>Key outcomes:</u> <ul style="list-style-type: none"> <li>Select the right layout option</li> <li>Identify the mutual shading opportunities on the site</li> <li>Identify size of shading devices</li> <li>Façade design recommendations</li> </ul>	Time estimate for Capstone project for Week 2: 3 hours
<b>Sunday, 10<sup>th</sup> May</b>	<b>Week 2 Assignment submission</b> <b>Week-2 Capstone project submission</b>			

ONLINE COURSES FOR FURTHER READING				
	Online course	1 hour	<b>Understanding Sun</b> <ul style="list-style-type: none"> <li>o Solar geometry fundamentals</li> <li>o Sunpath diagrams</li> <li>o Applications</li> </ul>	Online quiz
	Online course	1 hour	<b>Shading Mask</b> <ul style="list-style-type: none"> <li>o Why should you use shading mask?</li> <li>o How is a shading mask profile generated?</li> <li>o Applications</li> </ul>	Online quiz
Week 3				
Date	Format/ time (IST)	Duration	Session topic	Assignment
Wednesday, 13 <sup>th</sup> May	Webinar 6:00pm – 9:00pm	1 hours	<b>MODULE – 7: Daylighting fundamentals</b> <ul style="list-style-type: none"> <li>o Advanced daylight performance metrics</li> <li>o Impact of shading devices on glass specifications</li> <li>o Criteria for glass selection</li> </ul>	Assignment – 3.1  (Time estimate: 2 hours)
		1 hour	<b>MODULE – 8: Daylighting design</b> <ul style="list-style-type: none"> <li>o Daylight Energy Conservation Building Code</li> <li>o Enumerate simple design guidelines</li> </ul>	
		30 mins	<b>MODULE-9: Communications – II</b> <ul style="list-style-type: none"> <li>o Early design communication</li> <li>o Understanding your role</li> <li>o Getting the point across</li> </ul>	
		30 mins	<u>QnA session</u>  <b>Capstone project</b> Webinar will introduce the project for Week-3: 'Daylighting Report'. Participants will work on the project at their own time.  <u>Key outcomes:</u> <ul style="list-style-type: none"> <li>o Tabulate daylit areas for the project</li> <li>o Evaluate the WWR</li> <li>o Calculations to assess area meeting the UDI requirements as per ECBC</li> <li>o Derive glazing recommendations</li> <li>o Summarize outcomes from previous weeks and create a package of design guidelines.</li> </ul>	Time estimate for Capstone project for Week 3: 4 hours

<b>Sunday, 17<sup>th</sup> May</b>		<b>Week 3 assignments due</b> <b>Week-3 Capstone project due</b>		
<b>ONLINE COURSES FOR FURTHER READING</b>				
	online course	1 hour	<b>Daylighting 101: Technical Terms, Daylighting 102: All about Glass</b> <ul style="list-style-type: none"> <li>○ Clarity of daylight related technical terms and units</li> <li>○ Glass properties</li> </ul>	Online quiz
	online course	1 hour	<b>Daylighting 103: Design Guidelines</b> <ul style="list-style-type: none"> <li>○ Design guidelines for concept stage application</li> <li>○ Rules of thumb for estimation of daylight levels in the space</li> </ul>	Online quiz

**Sample Certificate:**





## Program Faculty:

This course has been developed by experts from [Environmental Design Solutions Pvt Ltd \(EDS\)](#). EDS is a sustainability advisory firm focusing on the built environment. Since its inception in 2002, EDS has worked on over 350 green building and energy efficiency projects worldwide. The diverse milieu of its team of experts converges on climate change mitigation policies, energy efficient building design, building code development, energy efficiency policy development, energy simulation and green building certification.

## Lead Instructor

### Deepa Parekh

Lead - Sustainability Education Program

Deepa has a background in architecture and building science. She has worked on number of projects in the US and in India with experience in facilitating green building certifications, high performance building consulting, whole building energy and daylight simulations, green building policy research and analysis.

Deepa leads the '[Sustainability Education Program](#)' at EDS. Using her expertise in teaching complemented by professional experience, she leads her team to develop high quality bite sized course modules for online learning on sustainability. Also, a USGBC<sup>1</sup> Faculty and ECBC<sup>2</sup> Master Trainer, Deepa has conducted over 30 training programs for a varied group of learners. She also curates and conducts blended learning programs for students and professionals that combines live webinar, online course modules and in-person workshops.

Deepa will be main instructor for this program.

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<sup>1</sup> United States Green Building Council

<sup>2</sup> Energy Conservation Building Code of India

## Expert Panel

Experts in this panel bring their diverse and extensive professional experience in answering queries of participants. This platform is an opportunity for participants to interact with some of the best professionals in sustainability consulting. Following members form the expert panel.

### **Hisham Ahmed**

Senior Associate Director

Environmental Design Solutions Pvt Ltd

Hisham is overseeing a team of engineers and architects delivering a wide variety of projects. He is currently looking after more than 50 design assistance projects. He is in-charge of project management, invoicing and business development. He has been a speaker at various Lectures/seminars/workshops on energy efficiency specifically for promoting energy conservation building code, ECBC India. Hisham has over 10 years of extensive experience on software-based building energy simulation (International (ASHRAE) and Local energy code (ECBC India) compliance analysis). He is involved in energy efficient HVAC concept design for a number of projects.

Hisham is responsible for internal quality check of all LEED Energy and Indoor Air Quality submissions. He also performs a role of a reviewer for energy credits for LEED and IGBC projects. He has completed review of over 180 projects.

Hisham has both national and international experience through working on projects and conducting training in regions outside India. Hisham has delivered trainings on topics such as “Façade Design Optimization Using Energy Simulation” and “Advanced energy simulation training”.

A few prominent projects that he has worked on closely are ITC Gardenia Hotel (Bangalore, India); Delhi International Airport Terminal T3 (New Delhi, India); Beary's Global Research Triangle (Bangalore, India), OMD TECOM (Dubai,UAE) and Hilton Hotel (Istanbul, Turkey).

### **Abhishek Jain**

Associate Director

Environmental Design Solutions Pvt Ltd

Abhishek has over 10 years work experience as Project Manager and Sustainability Consultant with domain expertise and technical knowledge of integrated design of sustainable built-environment and construction management, renewable energy systems, building analysis and auditing, Green Building Certifications, climate change policy research & development, and corporate & enterprise sustainability.

He has coordinated with Central Public Work Department (CPWD), Govt. of India on 2 prestigious public sector projects; Extension to Parliament Annexe & Minister of Parliament Multi-storied Housing for sustainable design & integrated project management initiatives.

He has supervised and lead a team of construction management of 6 private sector projects including HCL IT Technology Park, ITC Group's 5-Star Golf Resort, Mayar Groups' Bio-technology Lab, Lalit Groups Boutique Hotel, and Residential Township Projects for Sahara Group.

He has successfully completed 3 US Green Building Certification for Airports Authority of India, CPWD, and Ministry of External Affairs for the LEED® India Gold Certification of 7 million sqm Indira Gandhi International Airport Terminal, 3,16,000 sqm Thyagraj Netball Stadium, and 60,000 sqm Jawaharlal Nehru Bhawan respectively.

### **Ashutosh Gupta**

Associate Director

Environmental Design Solutions Pvt Ltd

Ashutosh has over 8 years of work experience in the field of sustainability. He heads the testing and commissioning team at EDS. He has worked on LEED documentation of over 25 projects. He is responsible for internal quality control for all LEED submissions under the LEED EB O+M rating system.

Ashutosh has conducted detailed assessment and recommendations for projects in Indonesia, India, Bangladesh and Tanzania to achieve Energy Efficiency performance standards. The project scope included feasibility study, conducting preliminary audit & investigation, checklist & gap analysis. Some of the notable projects are the 7 million sft Delhi International Airport (T3) which achieved Gold level certification under LEED NC program, several ITC Hotels to get them certified under LEED EB O+M rating and the latest TIPL project in Noida to receive Platinum rating under LEED v4 BD+C rating system.

He also conducted training programs for professionals. Notably, he has organized a three-day workshop and training program on "Green building Certification Process and Energy Efficiency in Commercial Building" for affiliates of a multinational company which included participants from South Korea, Philippines, Thailand and India.

He has conducted training program for university students and academics to disseminate knowledge on: Energy and Sustainability, Climate change adaptation and mitigation, EE technologies, EE Policies and Legislation, EE financing initiative, EE cost analysis etc.

### **Piyush Varma**

Associate Director

Environmental Design Solutions Pvt Ltd

Piyush Varma, a qualified Architect and Engineer, has been associated with Environmental Design Solutions Pvt. Ltd in the capacity of a Sustainability Expert since July, 2010. Over the

09 years of experience, Piyush has successfully collaborated with various design teams in promoting and achieving sustainable architecture. Prolific at performing parametric analyses, sensitivity analysis, life cycle analysis, and employing several other analytical tools, Mr. Varma has been actively engaged in affecting Building Performance vis-à-vis energy consumption, thermal performance, daylight potential, material management, etc.

At EDS, Piyush leads the software vertical and has successfully managed two editions of a policy framework tool. He is currently heading a team of developers in preparing tools capable of automated report generation, energy consumption visualization application, Google Map based APIs and application for listing and procurement of Green Materials. Skilled in programming languages like MATLAB and C#, Piyush, is also engaged in research work and is developing Building Envelope Optimization Tool. Piyush has been actively involved in policy formulation and developing analytical tools as decision aids.

### **Dipti Arora**

Associate Director

Environmental Design Solutions Pvt Ltd

Dipti Arora specializes in green building rating systems and is well versed with all aspects of Solar Passive Building Design, Renewable and Alternative Energy Systems, Day lighting, exterior lighting analysis, Energy Simulation, Alternative Building Materials and Technologies, Carbon footprint and CDM. With over 8 years of experience in the green building industry, she has provided consultancy and facilitation services for over 28 green building projects. She has been providing expert consultancy and facilitation services for various green building rating systems i.e GRIHA, LEED, IGBC Rating systems. Some prominent projects include Infosys SDB1 Pocharam, Hyderabad, Suzlon One Earth, Pune, Gandhi Research Foundation, Jalgaon and VVIP Circuit House, Pune and Pan India TCS (IT & BPO) projects.

She is an active team member carrying out third party reviews for US Green Building Council and Indian Green Building Council and has reviewed more than 200 reviews for all building types i.e New Construction, Core & Shell, residential buildings etc. She has developed standard procedure and tools for Green Building Rating system documentation to ensure quality control for submittals to the Rating bodies.

At EDS, she is responsible for quality control for all submissions made under the LEED Proven Provider for the LEED ID + C v3.0 and v4.0 Rating system. Further, she plays an instrumental role in implementing the LEED Volume Program for Citibank Retail projects in the Asia Pacific Region. This LEED coordinator role includes education and quality control for documentation submitted by the project team. Dipti also leads the team working on projects aiming for WELL certification.

## Frequently Asked Questions:

**1. What are the timings of this program?**

Online webinars will be conducted as per timing mentioned in the schedule. On-demand modules can be completed as per convenience.

**2. What do I need to bring to the program?**

You just need a personal laptop and internet connection to attend and complete this program.

**3. What if I am not able to attend the webinar?**

Try NOT TO MISS any webinars. In case you are not able to attend the webinar, please send an email informing the instructor about your absence.

**4. Can I get access to the webinar recordings?**

Yes, all webinars will be recorded and be available to the registered participants

**5. Can I have access to the online self-paced modules after the program is over?**

Yes, once you sign up for the program, you will have access to the online modules after the program as well.

**6. Can I attend the webinar through my phone?**

Yes, you can sign into the webinar through your phone. For an effective learning experience, we recommend using your laptop or desktop.

**7. The schedule looks extensive. I am busy with my work/classes. How do I optimize my time?**

This program has been planned for busy professionals and full time students/faculty. Hence the webinars are scheduled only 1 per week. The key is to plan your time in advance as per the program schedule and being CONSISTENT. This will help you complete this program successfully. Moreover, working in groups will also help you optimize time in solving quiz and assignments.

**8. What should I do if I have any question or query with respect to the course content during the week?**

You can post your question on the Google Classroom set up for your course and the instructor will respond. You can also ask your questions during the 'Open classroom hours' as scheduled by the instructor during each week.

**9. Do I need to complete all the self-paced online modules that are shared for additional reading?**

It is highly recommended to complete the online modules. The topics will be relevant to the topic discussed each week. This content will help bring clarity in technical fundamentals. This will further help you apply your understanding better on the capstone project.

**10. The program content sounds a bit like the 'Environment Controls' / 'Climatology' / 'Climate Design Studio' classes I have taken in architecture college. How is this program different?**

The core concepts of climate analysis, solar response and daylight is based on science. This has not and will not change in the coming times. However, it is evident from the kind of buildings designed today that these concepts are not applied successfully in practice. There is clearly a gap between theory and application. **The focus of this program is to teach you the application in a manner that you can immediately apply on your project.** This program is designed by experts from EDS who provide professional consulting on these concepts. The content brings their expertise and understanding of the gap in practice.

**11. When will I get the certificate?**

A 'certificate of completion' will be awarded only after the submission of all assignments and the capstone project. A 'certificate of participation' will be awarded to participants who have attended the sessions. The soft copy of the certificate will be emailed to the participant.