



STRUCTURAL ENGINEERING

QUARTERLY JOURNAL OF
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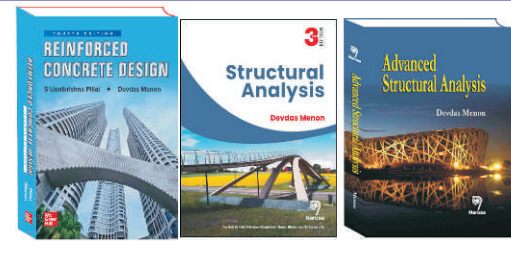
OF

STRUCTURAL ENGINEERS

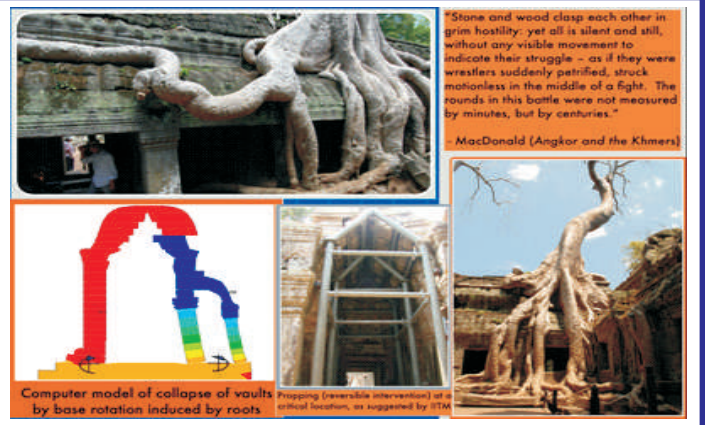
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LET US BUILD A STRONG STRUCTURE OF INDIAN SOCIETY

GEM 38 : Dr. DEVDAS MENON–INSPIRING ACADEMIC, CONSULTANT, AUTHOR, AND MENTOR

Dr. N. Subramanian, Ph.D., FNAE



Prof. Devdas Menon (1958-)

Dr. Devdas Menon is currently Professor and P. C. Varghese Institute Chair in the Department of Civil Engineering at IIT Madras. He is a very popular teacher, consultant and author who has written several technical books on structural engineering (Reinforced Concrete Design, Structural Analysis, and Advanced Structural Analysis). He has also published a large number of technical papers, and has received several awards. His video lectures, available in NPTEL and YouTube, are widely watched by audiences across the world. He has also guided numerous Ph.D., M.S. and M.Tech. theses.

As a structural consultant, he is known for his expertise in the design of reinforced and prestressed concrete buildings, bridges, stadia, chimneys, towers, liquid retaining structures, etc. He is also known for his innovative research and development in affordable and sustainable building systems for mass housing using glass fibre reinforced gypsum (GFRG) panels. He has also developed biomechanical orthopaedic devices and has two patents to his credit.

He has a special interest in developing codes of practice, and has served as the Chairman of the Bureau of Indian Standards CED 38 Committee on "Special Structures" from 2006 to 2022 – overseeing the standards for the design of RC chimneys (IS 4998), cooling towers (IS 11504), bins (IS 4995), composite structures (IS 11384), shells and folded plates (IS 2210), tall buildings (IS 16700), etc.

What makes Prof. Devdas Menon unique is the fact that he is equally well known for his talks, workshops and writings on finding meaning and fulfilment in life through self-awareness and inner transformation. He is of the view that our modern education is woefully incomplete in terms of its lack of emphasis on inner development, wisdom and compassion – which he sees as the main cause for the widespread inability to deal with increasing distraction and stress, corruption and self-centredness, and lack of enduring fulfilment in life. He points out that even in our best educational institutions (in India and elsewhere), it is practically impossible to conduct any examination without any invigilation, expecting the students to follow 'dharma' and avoid cheating and copying – despite high institutional metrics and rankings.

Prof. Menon is also well known for his lectures and workshops for students, teachers and corporate organisations. He teaches two uniquely designed and hugely popular 'free elective' courses at IIT Madras, GN5001: Self Awareness and GN6001: Integral Karmayoga, which are open to all interested students and faculty. He has also authored four books on these topics.

EARLY LIFE AND SCHOOLING

Devdas Menon was born and brought up in Kolkata, where his father, Sri MMA Menon, was employed as a senior executive. He had his schooling at St. Xavier's, Kolkata, where he excelled as a student, having additional interests in creative writing and playing hockey. He recalls being attracted to mechanics, and had initially aspired to study mechanical engineering at an IIT. But after completing his Indian School Certificate examination in 1974 with distinction, he settled for a B.Tech. programme in civil engineering at IIT Madras.



Devdas Menon with his mother (Madhavi), sister (Girija) and father (MM Achutha Menon)

ENGINEERING EDUCATION & PROFESSIONAL LIFE

In an interview given to students, he recalls: “Although I did get an opportunity to switch to any branch after completing my first year at IIT Madras, I chose to stay back in civil engineering – the branch that fate had assigned to me when I joined in 1975. I discovered that mechanics could be pursued equally well in structural engineering – a career that opened up for me subsequently. I enjoyed dwelling on the mechanics underlying the analysis and design of various kinds of structures – ranging from small buildings and industrial sheds to tall buildings and towers and long span bridges.”



Devdas Menon graduated with distinction in civil engineering from IIT Madras in 1980

He worked in the industry, in structural design consultancy, at New Delhi (1980-'85), and during this time, did a (part-time) post-graduation course in structural engineering at IIT Delhi. He subsequently shifted to Calicut to be with his parents, opting for an academic career, joining as a Lecturer at REC Calicut in 1985. During this time, he continued his education in structural engineering, receiving degrees of M.Sc. (by research) from the University of Calicut in 1989 and Ph.D. from IIT Madras in 1995.

He also ventured to do a post-graduate course in English Literature at the University of Mysore. His academic performance had been consistently top ranking. He later joined the department of civil engineering at IIT Madras as a faculty in 1998, and has been serving as Professor since 2004, engaged in teaching, research and consultancy.

FAMILY

Prof. Devdas Menon is married to Ms Roshni, who teaches History at the school 'Sishya' at Chennai. She has been his companion and support for more than three decades.



Roshni and Devdas Menon

EMPHASIS ON FUNDAMENTAL UNDERSTANDING

Prof. Menon recalls in an interview: “When I first started working (in 1980) as a structural designer, I particularly liked the motto of our company – to design structures that were most efficient, economical, and aesthetic in appearance. Later, when I joined academics, I enjoyed teaching, research and development, as well as consultancy related to various challenges in structural engineering. The challenge for me was to look for simple and elegant solutions based on intuition and simple manual calculations, rather than computationally intensive analysis. This is the approach I advocate for my students and research scholars. It is thoroughly enjoyable.”

It is this practical outlook and constant interaction with structural engineering practice that inspired the selection of topics for research by his Ph.D., M.S. and M.Tech. scholars. These comprised wide-ranging topics, such as the analysis and design of PSC sleepers, box girder RC bridges, slender RC

beams, seismic resistance of RC stepped building frames and open ground storey RC framed buildings, wind-induced interference effects on buildings, glass fibre reinforced gypsum walls and composite slabs, probabilistic load modelling of highway bridges, RC bridge pier caps, creep and shrinkage effects on RC walls and PSC girders, etc. Prof. Devdas Menon is of the view that inspiring and meaningful teaching of structural design is truly possible only if the teacher speaks from first-hand personal experience in design and construction, and not bookish knowledge. He belongs to the old school (and now a vanishing species!) of engineers who would carry out preliminary analysis and design of structures using simple hand calculations, rather than be entirely dependent on computers and software. One of the projects that he sometimes refers to in his design classes is the famous ship-shaped indoor stadium at Kochi, in which he was a key designer. The picture of this beautiful building appeared on the cover page of his first book titled Reinforced Concrete Design by S.U. Pillai and Devdas Menon, published by Tata McGraw-Hill in 1998.



Structural design of a unique ship-shaped indoor GCDA stadium for the Regional Sports Centre, Kochi (1993)

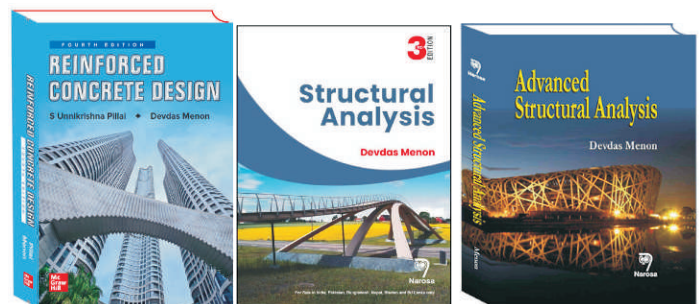
TECHNICAL BOOKS AND PUBLICATIONS

The book on Reinforced Concrete Design has undergone several editions, and its fourth edition was released in 2022. It is widely used as an authoritative reference not only by teachers and students, but also by practising structural engineers. Here is a quote from the book, which reflects the style of writing and emphasis on clear understanding of concepts: The codes are not meant to serve as a substitute for basic understanding and engineering judgement. The student is, therefore, forewarned that he will make a poor designer if he succumbs to

the unfortunate (and all-too-common) habit of blindly following the codes. On the contrary, in order to improve his understanding, he must learn to question the code provisions — as, indeed, he must, nearly everything in life!

This basic philosophy has been followed in two other popular textbooks authored by Prof. Devdas Menon: Structural Analysis (Narosa Publications, 3rd Edition) and Advanced Structural Analysis (Narosa Publications, 3rd Edition). In the Preface to his book on Structural Analysis, he has this important insight to offer: Structural Analysis is one of those subjects in engineering that has the potential of awakening a wonderful blend of reason and intuition in the learner. Teachers, who appreciate this, invariably enjoy the classroom experience, because every time, it has some new and refreshing insight to offer. It is a wonderful experience to observe the learning process unfold in ever-new and creative ways in students. He goes on to warn: There is an increasing tendency in modern structural engineers to lean heavily on software packages for everything, and this addiction induces a false sense of knowledge, security and power. The computer is indeed a powerful tool and asset for any structural engineer, for carrying out repetitive work and for generating quick solutions to complex problems. It is dangerous, however, to make the tool one's master, and to make it a convenient substitute for human knowledge, experience and creative thinking.

Prof. Menon has also served as one of the editors of the Handbook on Seismic Retrofit of Buildings (sponsored by CPWD, Indian Building Congress, and IIT Madras).



Popular textbooks authored by Prof. Devdas Menon

Some of the key technical papers authored or co-authored by Prof. Devdas Menon in the past ten years are listed below:

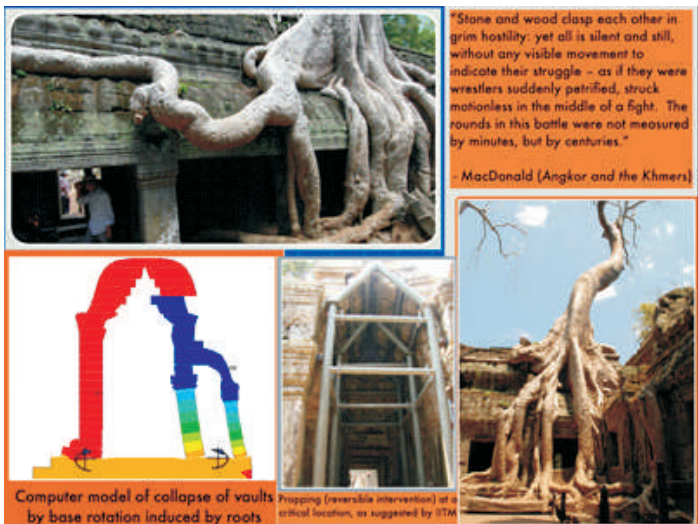
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6. Adrija D., InduGeevar, Devdas Menon and Meher Prasad, "Strength assessment of RC deep beams and corbels", *Structural Engineering and Mechanics*, 77 (2), pp 273-291, 2021.
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design of open ground storey buildings”, Structural Engineering and Mechanics, Vol. 54, No. 1, pp 19-33, January 2015.

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EXAMPLES OF INNOVATIVE RESEARCH AND CONSULTANCY WORK

Among the interesting and innovative consultancy projects handled by Dr Devdas Menon, as a key member of the team from IIT Madras, is the assistance offered to the Archaeological Society of India (ASI) to help restore the Ta Prohm temple at the Angkor Wat complex at Cambodia. during 2008-2014. The structure had been covered and damaged by large trees. But the trees were also a major tourist attraction, and the challenge was to analyse the challenging problem of tree-structure interaction and to find a solution to prop up both the structure and the trees so that tourists could walk through safely.



Understanding and resolving the tree-structure interaction issues at Ta Prohm, Cambodia

Yet another challenging assignment was to restore a lighthouse structure at Little Andaman, which was damaged by the tsunami in 2004. While other consultants had suggested that there was no alternative to building a new lighthouse, Prof. Devdas Menon observed that much of the 45m tall lighthouse was intact, except for the plastic hinge formation at the base, involving yielding of longitudinal steel on one side and crushing of concrete on the other side. Based on his recommendations, the lighthouse was repaired and retrofitted economically, by means of concrete jacketing near the base region, ensuring the verticality of the tower.



Restoring a tsunami-damaged lighthouse at Little Andaman

Prof. Devdas Menon, along with his colleague, Prof. Meher Prasad, have pioneered the design and development of sustainable and economical buildings using glass fibre reinforced gypsum (GFRG) panels, suitable for mass housing in India. They have jointly guided six Ph.D.s in this area, and their R&D efforts have led to the publication of two BIS standards on GFRG panel specifications (IS 17400) as well as design and construction methodology (IS 17401). The first two-storeyed demo GFRG building was constructed in the IIT Madras campus in 2014 and is presently used as quarters for faculty. Subsequently, many such structures have been built in India, notably the four-storeyed hostel buildings at IIT Tirupati.



GFRG demo building at IIT Madras



GFRG hostel buildings at IIT Tirupati

AWARDS AND RECOGNITIONS

Dr Devdas Menon has been conferred several awards, notably the "Distinguished Service to the Institute (2013)" by the IIT Madras Alumni Association, the "Srimathi Marti Annapurna Award for Excellence in Teaching (2014)" by IIT Madras, the "Ultra-Tech Award for the Outstanding Concrete Engineer (2014)" by the Indian Concrete Institute (Chennai Chapter), and the "Guru Shreshta" award (2015) by Rotary Club (Madras NorthWest), "Institute Chair Professor" (2019) and P C Varghese Institute Chair (2021) for distinguished service in education, research and technology development.

He is also the recipient of The Architectural Engineering Division Gold Medal (1988-89) and Sir Arthur Cotton Memorial Prize (1992-93) of the Institution of Engineers (India) for his innovative research work on low-cost housing using coconut shell composites. He also has two patents to his credit – Patent for Dynamic External Wrist Fixator (filed 1997, awarded 2014) and Patent for External Fixator Assembly for Tibial Fracture (filed 1997, awarded 2014).



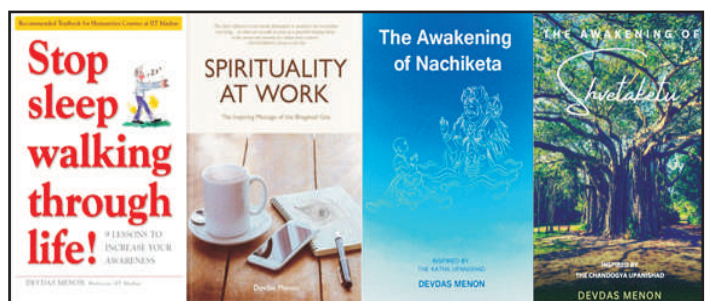
Award winning R&D work on low-cost housing



Award winning R&D work on orthopaedic devices

SELF-IMPROVEMENT AND SPIRITUALITY

In the realm of self-improvement and spirituality, Prof. Devdas Menon has also authored books titled, Stop sleepwalking through life! (Published also in Hindi) (1998), The Awakening of Nachiketa (published also in Malayalam), Spirituality at work (on the Bhagavad Gita) (2016), and The Awakening Of Shvetaketu, which are used as texts for the two uniquely designed, popular elective courses at IIT Madras, GN5001: Self Awareness and GN6001: Integral Karmayoga, which are open to all interested students and faculty.



He has been leading a team at IIT Madras, conducting week-long workshops on 'Self Awareness and Higher Goals in Education (SAHGE)' at IIT Madras for college teachers across the country since 2012. These workshops are hugely popular.



Prof. Menon taking a class on Self Awareness under the shade of a banyan tree at IIT Madras

Dr. Devdas Menon was initiated into Advaita Vedanta in his youth by Swami Krishnananda (of Rishikesh) and other teachers. Ever since, his approach to spirituality has been to see the 'formless aware presence', the one Divine, in all manifestation, despite the seeming differences in myriad names and forms and beliefs. He seeks to devote the next phase of his life (post-retirement) almost entirely in this direction, and several book projects are in the offing. He will continue to offer courses and workshops at IIT Madras.

In the Amazon web-page of the author, Devdas Menon, it is mentioned: This brief biography of the author is meant for pragmatic purposes: potential

readers may be interested. But the deeper truth is that all notions of individual authorship and doership are delusional, and it is important for the apparent doer to recognise this truth — whatever be the inner calling or the role being enacted (writer, teacher, engineer, etc.) in this game of life.

In the same vein, may this write-up on Prof. Devdas Menon serve the pragmatic purpose of inspiring structural engineers to explore and emulate in their own individual ways!

About The Author



Dr. N. Subramanian, Ph.D., FNAE is an award winning Author, Structural Engineering consultant and Mentor, currently based at Maryland, USA, with over 45 years of experience in Industry (including consultancy, research and teaching). He was awarded with a 'Life

Time Achievement Award' by the Indian Concrete Institute and many other awards for his contributions towards Structural Engineering. He is the author of 25 books and over 300 papers, including the famous books on 'Design of Steel Structures', 'Design of RC Structures' and 'Principles of Space Structures' and the recent 'Building Materials, Testing and Sustainability'. (email - drnsmanni@yahoo.com)

Publications For Sale		
Sr. No.	Name	Rs.
1	Design of Reinforced Concrete Structures for Earthquake Resistance	950/-
2	Professional Services by Structural Design Consultant – Manual for Practice	250/-
Proceedings		
1	National Conference on Corrosion Controlled Structure in New Millennium	500/-
2	Workshop on ISO-9001 for Construction Industry	250/-
3	Workshop on- seismic Design of Building – 23rd February,2002	250/-
4	Workshop on Effective Use of Structural Software, 6th March, 2004	250/-
5	One Day Seminar on "Shear Walls In Highrise Building",30th October, 2004	250/-
6	Seminar on "Innovative Repair Materials / Chemicals", 1st October, 2005	300/-
7	Seminar on "Foundations For Highrise Buildings", 23rd September, 2006	250/-
8	Seminar on structural Detailing in RCC Buildings- 26th Ma y,2007	300/-
9	One Day Work Shop on "Pile Foundations", 20th February, 2010	250/-
10	One Day One Day Seminar on "Pre - Engineered Structures", 29th January, 2011	250/-
11	One Day workshop on "Insight into Wind Loading using IS875, Part 3 : 2015", 27th April 2019	300/-
12	One day workshop on "Structural Health Evaluation Vis - A - Vis Prescriptive "Mandatory Format Of Structural Audit" On 18th Jan ,2020	300/-
13	"Performance Based Seismic Design of Buildings" by Er. Vatsal Gokani released on 5th August, 2022	600/-
14	Any ISSE Journal Copy	100/-
Note : Additional courier charges for Mumbai Rs. 50 for outstation Rs. 100).		