

UOE026: Miracles in Nanotechnology
(Version: 0.0, Open Elective, School of Sciences)

Lect.	Tut.	Practical.	Credits	Evaluation Scheme				
				Component	Exam	WT	Min Pass (%)	
2	-	-	2	Theory	FA	100	40	40

Course Description:

Discover the enchanting world of Nano Science and Nano Technology through the course "Wonders in Nano Science and Nano Technology." In this open elective, you'll embark on a journey into the realm of the extraordinary and minuscule. Chapter 1, "Nano Wonders," will illuminate the magical properties of materials like Graphene, Quantum Dots, and Nanoparticles. Explore the marvels of Nano Devices, from Energy Storage to Nanorobotics. Dive into the realm of Nano Catalysts, Spintronics, and the artistry of DNA Origami.

Course outcomes: At the end of this course students will be able to.....




CLO1	Gain a strong foundation in Nano Science's core concepts and materials.
CLO2	Apply nanomaterials effectively in real-world situations.
CLO3	Strengthen analytical skills for nanotechnology's impact and ethics.
CLO4	Explore interdisciplinary connections through nanotechnology's integration.

Syllabus (Theory)

Units	Description	Hours
I	Nano Wonders: Illuminating the World of Magical Materials Introduction, Nanomaterials: Graphene, CNT, nanowires, nanotubes, Nanoparticles Nanomagnets, Quantum Dots and nanodiamonds etc., Nano Devices: Nano-fluidics, Energy Storage, Energy conversion, Nano-sensors, Nanoelectromechanical Systems (NEMS), Quantum Dots LED Displays, & Nanorobotics etc., Nano Catalysts, Nano fertilizers, DNA Origami, Quantum Computing, Spintronics, Self-Assembly of Nanostructures, & Nanomedicine.	15
II	Nanotechnology Miracles: Real-World Transformative Applications Nanomedicine: Revolutionizing Healthcare, Nanoelectronics and Miniaturization, Nanomaterials for Energy Applications, Nanotechnology in Environmental Solutions, Nanotechnology in Materials Engineering, Nanotechnology in Space Exploration, Nanotechnology's Impact on Consumer Electronics, Nanotechnology in Various Fields (Agriculture, Pharmacy, Engineering, Material Science, Computer Science, Communications, Aeronautics, & Military).	15

References:

1. T. Pradeep, Nano: the essentials. Understanding nanoscience and nanotechnology, (2007) 432.
2. S.K. Kulkarni, Nanotechnology: Principles and Practices, Third Edition, Springer International Publishing, Cham, 2014.
3. G.L. Hornyak, H.F. Tibbals, J. Dutta, J.J. Moore, Introduction to Nanoscience and Nanotechnology, CRC Press, 2008.
4. J. Cornier, A. Owen, A. Kwade, M. Van de Voorde, Pharmaceutical Nanotechnology: Innovation and Production, Pharm. Nanotechnol. Innov. Prod. (2017).
5. D.G. Panpatte, Y.K. Jhala, Nanotechnology for agriculture: Advances for sustainable agriculture, Nanotechnol. Agric. Adv. Sustain. Agric. (2019) 1-305.
6. R. Waser, Nano electronics and Information Technology, Nanoelectron. Inf. Technol. (2012) 201-320.
7. M. Wilson, K. Kannangara, G. Smith, M. Simmons, B. Raguse, Nanotechnology, Chapman and Hall/CRC, 2002.


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