

1. **Name:** Dr. Kulwinder Singh Malhi
2. **Designation:** Professor
3. **Department:** Electronics & Communication Engineering
4. **Address for Correspondence:** Department of Electronics & Communication Engineering Punjabi University, Patiala (PB)-147002
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6. Academic and Professional Qualifications:				
S. No.	Examination	Board/University	Year of Passing	Division Class/Grade
i.	B. Tech. (ECE)	P. T. U Jalandhar	1998	First
ii.	M. Tech. (ECE)	P. T .U Jalandhar	2004	First
iii.	Ph. D. (ECE)	Punjabi University Patiala	2017	First

7. **Title of Ph.D. (ECE):** Investigation on Fiber Raman Amplification in Optical Communication Systems.
8. **Area of Specialization:** Fiber Optic Communication systems
9. **Working Experience:** 25 Years (UG)
14 Years (PG)

10. **Detailed Teaching Experience:**

i.	Department of Electronics & Communication Engineering, Punjabi University Patiala.	Professor	May, 2017 to till date
ii.	Department of Electronics & Communication Engineering, Punjabi University Patiala.	Associate Professor	September, 2013 to May, 2017
iii.	University College of Engineering, Punjabi University Patiala.	Associate Professor	December, 2009 to September, 2013

iv.	University College of Engineering,Punjabi University Patiala.	Reader	September, 2006 to December, 2009
v.	University College of Engineering,Punjabi University Patiala.	Lecturer	August, 2005 to September, 2006
vi.	SUS Institute of Engineering & Technology Tangori (Mohali)	Sr. Lecturer	1999 to 2005
vii.	Sant Longowal Institute of Engineering & Technology, Longowal ,Sangrur (PB)	Lecturer	1998 to1999

11. Professional Membership

S. No.	Name of Professional Body	Type of Membership	Year
i.	Institution of Engineers India (IEI):	Fellow, Life Membership No. F-1289795	2022
ii.	Indian Society for Technical Education(ISTE)	Life Member (LM 36283)	2003

12. Publications: Annexure I attached for publications Details:

i.	Journal Papers:	39 (International)
ii.	Conference Papers:	09 (International) 06 (National)

13. Research Experience: Annexure II attached for Details

i.	M. Tech. Thesis Guided	22 (Guided) 04 (On Going)
ii.	Ph.D. Thesis Guided	01 (On Going)

13. Refresher Course/ Short Courses/ seminars: Annexure III attached for Details

Seminars/Conferences/Workshops/Short-term-courses: 25

Annexure (I), Publications Details: (A) International Journals (37)

1. Kulwinder Singh, Manjeet Singh Patterh and Manjit Singh Bhamrah, “An effective numerical method for Gain profile optimizations of multi pumped fiber Raman amplifiers”, *International Journal of Light Electronics and Optics, Optik, Elsevier Science, Germany*, vol. 125, no. 10, pp. 2352-2355, October, 2014, SCI Indexed, IF: 1.414, ISSN: 0030-4026.
2. Kulwinder Singh, Manjeet Singh Patterh and Manjit Singh Bhamrah, “A comparative analysis of dual order bidirectional pumping Schemes in Optical fiber Raman amplification”, *Journal of Optical Communications (JOC), DE Gruyter, Germany*, vol. 40 no. 1, pp. 1–6, 2019. SCI Indexed, SCImago indexed, IF: 0.281, (ISSN: 0173-2911, E-ISSN: 2191-6322).
3. Kulwinder Singh, Manjeet Singh Patterh and Manjit Singh Bhamrah, “Analysis of Dual-Order Backward Pumping Schemes in distributed Raman Amplification System”, *Journal of Optical Communications, DE Gruyter, Germany*, vol. 39 no. 2, pp. 209–214, 2018. SCI indexed, SCImago Indexed, IF: 0.281, (ISSN: 0173-2911, E-ISSN: 2191-6322).
4. Kulwinder Singh Malhi, Manjeet Singh Patterh and Manjit Singh Bhamrah, “Performance analysis of distributed fiber Raman amplifiers employing higher order pumping schemes in optical transmission systems”, *Turkish Journal of Electrical Engineering & Computer Sciences, Tubitak, Turkey*, vol. 26, pp. 1946 – 1952, 2018. (SCI-E Indexed, IF: 708, ISSN: 1300-0632, E-ISSN: 1303-6203).
5. Dishant Khosla, Kulwinder Singh Malhi, “Rectangular Dielectric Resonator Antenna with Modified Feed for Wireless Applications”, *International Journal of Control and Automation* vol. 12, no.5, pp. 487 – 497, 2019. ISSN: 2005-4297, Scopus Indexed, IF 0.28.
6. Kanchan Chaudhary, Kulwinder Singh Malhi), “Design and Performance Analysis of Subcarrier Multiplexed Radio Over Fiber Optical Transmission System”, *International Journal of Scientific & Technology Research*, vol. 8, no. 11, 2019. (ISSN 2277-8616), Scopus Indexed.
7. Kulwinder Singh, Manjeet Singh Patterh and Manjit Singh Bhamrah), “Investigations on Multi Pumped Fiber Raman Amplifiers over WDM in Optical Communication System”, *International Journal of Computer Applications (IJCA)*, vol. 39, no.4, pp. 8-12, 2012. ISSN 0975 – 8887.
8. Shivani Sharma and Kulwinder Singh, “A Reversible Data Hiding Scheme to Embed High Capacity Data in Two-Dimensional Difference Histogram Modification”, *International journal of research in electronics and computer engineering, a unit of I2OR*, vol. 3, no. 3, pp. 108-116, 2015. ISSN: 2393-9028 (Print), ISSN: 2348-2281 (Online).

9. Arvinder Kaur, Kulwinder Singh, "Performance Evaluation of Gigabit Passive Optical Networks with Fiber Raman Amplification", *International Journal of Research in Electronics and Computer Engineering, A Unit of I2R*, vol. 5, no. 4, 2017. ISSN: 2393-9028 (Print), ISSN: 2348-2281 (Online).
10. Sukhbir Singh and Kulwinder Singh, "Investigations on Receiver sensitivity of SOA based optical communication system using RZ super Gaussian pulse" *International Journal of Engineering Research & Technology*, vol. 1, no. 3, pp. 1-8, 2012.(ISSN: 2278-0181).
11. Sukhbir Singh and Kulwinder Singh, "Investigations on Receiver sensitivity of 10 Gbps SOA based optical communication system" *International Journal of Computers & Technology*, Vol. 1, pp. 76-83,2012. (ISSN: 2277-3061).
12. Anupjeet Kaur and Kulwinder Singh, "Wavelength Converters in Optical Communication Systems", *JESTECH Engineering Science and Technology: An International Journal*, vol.3, no.2, 2013. ISSN: 2250-3498.
13. Anupjeet Kaur and Kulwinder Singh,"Performance analysis of semiconductor optical amplifier using four wave mixing based wavelength converter for all optical networks" *International Journal of Engineering Research and Applications. (IJERA)*,vol. 3, no. 4, pp. 108-113, 2013.(ISSN: 2248-9622).
14. Chinky Rani and Kulwinder Singh, "Performance analysis of bi-directional broadband passive optical network using travelling wave" *International Journal of Engineering Research and Applications*,vol. 3, no. 4, pp. 114-118, 2013.(ISSN: 2248-9622).
15. Prabhpreet Kaur and Kulwinder Singh, "Analysis of four wave mixing effect at different channel spacing in multichannel optical communication System. " *International Journal of Engineering and Innovative Technology*, vol. 3, no. 5, pp. 320- 323,2013.(ISSN 2277-3754).
16. Prabhpreet Kaur and Kulwinder Singh," Investigation of four wave mixing effects using different modulation formats in optical communication system", *International Journal of Engineering Research and Applications*, vol. 4, no. 1, pp. 176-181,2014. (ISSN: 2248-9622).
17. Kamalbir Kaur and Kulwinder Singh,"Performance Analysis of 16 channel WDM system using erbium doped fiber amplifier", *International Journal of Engineering and Innovative Technology*, vol. 4, no. 1, pp. 50-57, 2014.(ISSN: 2277-3754).
18. Kamalbir Kaur and Kulwinder Singh, "Analysis of numerical aperture dependence in L band 16 channel WDM optical communication system", *International Journal of Engineering Research and Applications*,vol. 4, no. 1, pp. 50-57, 2014. (ISSN: 2248-9622).

19. Areet Aulakh and Kulwinder Singh, "To investigate effects of extinction ratio on SOA based wavelength Converters for all Optical Networks", *International Journal of Scientific Research Engineering & Technology*, vol. 3, no. 2, pp. 289-294, 2014. (ISSN 2278 – 0882).
20. Amninder Singh and Kulwinder Singh, "Investigate the Performance of QAM Communication System by Transforming Linear Phase Filter Design using Parks-McClellan Algorithm into Minimum Phase Filter", *International Journal of Computer Applications*, vol. 93, no. 14, pp. 38-42, 2014. (ISSN: 0975 – 8887).
21. Amninder Singh and Kulwinder Singh, "Cost Analysis of Different Digital Fir Filter Design Methods" *International Journal of Engineering Research and Applications*, vol. 4, no. 5, pp. 70-72, 2014. (ISSN: 2248-9622).
22. Areet Aulakh and Kulwinder Singh, "To Investigate the Characteristics Parameters of Semiconductor Optical Amplifier based on Wavelength Converters for all Optical Networks", *International Journal of Computer Applications*, vol. 95, no. 19, pp 37-41, 2014. (ISSN: 0975 – 8887).
23. AmritPal Singh and Kulwinder Singh, "Demonstration of a Bidirectional WDM-PON with 10 Gb/s Downstream DQPSK and 5 Gb/s Upstream Re-modulated OOK Data Based on Reflective Semiconductor Optical Amplifier", *International Journal of Innovative Science, Engineering & Technology*, vol. 1, no. 4, 2014. (ISSN: 2348-7968).
24. Neetu Singh and Kulwinder Singh, "Performance Analysis of Semiconductor Optical Amplifier as Pre amplifier in 16 Channel NRZ Optical Transmission System", *International Journal of Innovative Science, Engineering & Technology*, vol. 2, no. 1, January 2015. (ISSN 2348–7968).
25. Shivani Sharma and Kulwinder Singh, "A Reversible Data Hiding Scheme Based on Two-Dimensional Difference-Histogram Modification to Embed Binary Data", *International Journal of Advanced Research in Computer Engineering & Technology*, vol. 4, no. 10, pp. 3795-3804, 2015. (ISSN: 2278 – 1323).
26. Sukhvir Kaur, Kulwinder Singh, "Hybrid Security Using Encryption Algorithm in Wireless Adhoc Network", *An International Journal of Engineering Sciences*, vol. 20, pp. 31-35, 2016. (ISSN: 2229-6913, Print, ISSN: 2320-0332 Online).
27. Supreet Singh, Kulwinder Singh, "Analysis of Self Phase Modulation Fiber nonlinearity in Optical Transmission System with Dispersion", *An International Journal of Engineering Sciences*, vol. 20, pp. 36-40, 2016. (ISSN: 2229-6913 Print, ISSN: 2320-0332 Online).

28. Supreet Singh and Kulwinder Singh, "Analysis of Self Phase Modulation Effect in 40 Gb/s Optical Fiber Communication System for Various Modulation Formats with Dispersion Compensation" *An International Journal of Engineering Sciences*, vol. 20, pp. 41-45, 2016. (ISSN: 2229-6913 Print, ISSN: 2320-0332 Online).
29. Gagandeep Singh Walia, Kulwinder Singh, and Manjit Singh Bhamrah, "Performance Evaluation of Hybrid Raman-EDFA Optical Amplifiers in Dense Wavelength Division Multiplexed Optical Transmission System", *International Journal on Future Revolution in Computer Science & Communication Engineering*, vol. 3 no.8, pp. 132 – 138, 2017. (ISSN: 2454-4248)
30. Sourabh Maini, and Kulwinder Singh Malhi, Performance Analysis of Vertical Cavity Surface Emitting Laser at Different Temperatures and Cavity Volumes, *International Journal in Applied Studies and Production Management*. vol. 4, no. 2, pp. 94-99, 2018.
31. Gagandeep Kaur and Kulwinder Singh Malhi, Performance Investigations on Super Continuum based Spectrum Sliced Wavelength Division Multiplexer Free Space Optical Communication, *Journal of Emerging Technologies and Innovative Research*, vol. 5, no. 8, pp. 985-992, 2018. (ISSN-2349-5162)
32. Gagandeep Kaur and Kulwinder Singh Malhi, "Architectural Analysis of Spectrum Sliced Wavelength Division Multiplexed Free Space Optical Communication", *International Journal of Research and Analytical Reviews*, vol. 5, no. 3, pp. 583-593, 2018. (E-ISSN 2348-1269, P-ISSN 2349-5138).
33. Ajaybeer Kaur, Manjit Singh Bhamrah, Kulwinder Singh Malhi, "Performance Evaluation of Hybrid Optical Amplifier in fiber Optical Communication system", *International Journal of Advanced Computing and Electronics Technology (IJACET)*, vol. 4, no. 2, 2017. ISSN: 2394-3408, E-ISSN: 2394-3416.
34. Aruna Rania, Manjit Singh Bhamrah, Sanjeev Dewra, Kulwinder Singh, "Simulative Analysis of Optical OFDM System using EDFA-Raman Hybrid Optical Amplifier" *International Journal of Research in Engineering, Technology and Science*, www.ijrets.com, , vol. 7, Special Issue, pp-1-6, 2017. (ISSN 2454-1915).
35. Dishant Khosla and Kulwinder Singh Malhi, "An Ultra-Wideband Dielectric Resonator Antenna for WSN based IoT applications in agriculture", *International Journal of Sensors, Wireless Communications and Control, Bentham Science*, vol. 12, no. 4, pp. 281-291, 2022. ISSN: 2210-3279, E-ISSN: 2210-3287, Cite Score 2021. 1.1, (Scopus Indexed)

36. Shabnam, Kulwinder Singh Malhi, “Characteristic Investigations of Raman/EDFA Hybrid Optical Amplifier in Multichannel Transmission System”, *International Journal of Research in Electronics and Computer Engineering A Unit of I2OR, IJRECE*, vol. 10, no. 4, pp. 97-102, Oct.-Dec. 2022. ISSN: 2393-9028, E-ISSN: 2348-2281.
37. Lakhvir Kaur, Kulwinder Singh Malhi & Beant Kaur, “Facial emotional recognition with feature extraction technique” *Goya Journal*, Vol. 16, no. 5, pp. 365-372, May 2023 (ISSN NO 0017 – 2715). DOI: 12. 163022. Gj.2023. v16.05.0050.
38. Dishant Khosla and Kulwinder Singh Malhi, “Investigations on designs of DRA for C band applications”, *International Conference on Recent Innovations in Computing*, Springer, pp. 201-209, January 2021. (Scopus Indexed)
39. Dishant Khosla and Kulwinder Singh Malhi, “A review on RFID using different Dielectric Resonator Antennas for Industry 4.0”, *Materials Today: Proceeding*. 2023. (Scopus Indexed), <https://doi.org/10.1016/j.matpr.2023.03.499>.

(B) Publications in International Conferences (08)

1. Sukhbir Singh, Kulwinder Singh, “Analysis of Receiver sensitivity of spectrum-sliced WDM system” *International Conference on Recent Advancements in Technology and Management*, Continental Group of Institutes, Fatehgarh Sahib Punjab, 2011.
2. Prabhpreet Kaur, Kulwinder Singh Malhi, “Four wave mixing mitigation techniques with chromatic dispersion in multichannel optical communication system”, *International Conference on Emerging Technologies in Electronics and Communications (ICETEC-13)*, Guru Nanak Dev University Amritsar, Punjab, 2013.
3. Sukhvir Kaur, Kulwinder Singh, “Hybrid Security Using Encryption Algorithm in Wireless Adhoc Network”, *Second International Conference on Innovative Trends in Electronics Engineering (ICITEE2)*, Department of Electronics & Communication engineering, Punjabi University Patiala, 2016.
4. Supreet Singh, Kulwinder Singh “Analysis of Self Phase Modulation Fiber nonlinearity in Optical Transmission System with Dispersion”, *Second International Conference on Innovative Trends in Electronics Engineering (ICITEE2)*, Department of Electronics & Communication engineering, Punjabi University Patiala, 2016.
5. Supreet Singh, Kulwinder Singh, “Analysis of Self Phase Modulation Effect in 40 Gb/s Optical Fiber Communication System for Various Modulation Formats with Dispersion Compensation”

Second International Conference on Innovative Trends in Electronics Engineering (ICITEE2), Department of Electronics & Communication Engineering, Punjabi University Patiala, 2016.

6. Dishant Khosla, Kulwinder Singh Malhi, “Investigations on designs of Dielectric Resonator Antennas for WiMax & WLAN applications”, 5th IEEE International Conference on Parallel, Distributed and Grid Computing(PDGC-2018), 20-22 Dec, 2018, Solan, India.
7. Lakhvir Kaur, Kulwinder Singh Malhi, Harjinder Singh, Beant Kaur & Deepak Saini (2023), “facial Expression Recognition with Local Binary Pattern in Machine Learning ” 4th International Conference on Innovative Trends in Electronics Engineering (ICITEE4), Department of Electronics & Communication Engineering, Punjabi University Patiala, 2023.
8. Arsh Mahajan, Kulwinder Singh Malhi, “Performance Investigations of 40 Gb/s Orbital Angular Momentum Multiplexed Free Space Optics Transmission System under Weather Turbulence”, 4th International Conference on Innovative Trends in Electronics Engineering (ICITEE4), Department of Electronics & Communication Engineering, Punjabi University Patiala, 2023.
9. Dishant Khosla and Kulwinder Singh Malhi, “Investigations on designs of DRA for C band applications”, International Conference on Recent Innovations in Computing, Springer, pp. 201-209, January 2021. (Scopus Indexed)

(C) Publications in National Conferences: Published/Presented (06):

1. Kulwinder Singh and R.S. Kaler, “Simulation of 10 Ghz NRZ optical communication system with self-phase modulation effects”, *IETE National symposium. (NSNM-2003)*, 2003, PEC, Chandigarh.
2. Kulwinder Singh and R.S. Kaler (2004), “Analytical studies of higher order dispersion terms in single mode optical communication system” National seminar CETEC-2004, held at SLIET, Longowal, Sangrur (PB).
3. Kulwinder Singh and R.S. Kaler (2004), “Higher order chromatic dispersion in single mode optical communication systems” National conference ECCS-2004, held at TIET, Patiala (PB).
4. Ramanpreet Kaur and Kulwinder Singh (2011), “Raman Amplifier Noise Figure Characteristics and Improvement methods” National Conference on advances in computational intelligence”, (NCACI 11) held at Sat Priya Group of Institutions, Rohtak (Haryana).
5. Amandeep Kaur and Kulwinder Singh (2011), “Improving Performance of Double Rayleigh Backscattering (DRBS) in Raman Amplifiers Using Isolators and other Methods”, National

Conference on advances in computational intelligence (NCACI 11) held at Sat Priya Group of Institutions, Rohtak (Haryana).

6. Kirandeep Kaur and Kulwinder Singh (2011), "Different Methods to Achieve Gain Flatness in Raman Fiber Amplifier", National Conference on advances in computational intelligence (NCACI 11) held at Sat Priya Group of Institutions, Rohtak (Haryana).

Annexure (II): M. Tech. Thesis Supervised (22) Completed:

S. No.	Name of Student & Roll/Regd. No.	Title of Thesis	Supervisor(s)	Year of Completion
1.	Ramanpreet Kaur (Regd. No. UCE(P)2009-665)	Investigations on noise figure in fiber Raman amplifier	Kulwinder Singh	July, 2011
2.	Kirandeep Kaur (Regd. No. UCE(P)2009-666)	Gain profile optimizations of fiber Raman amplifiers	Kulwinder Singh	July, 2011
3.	Amandeep Kaur (Regd. No. UCE(P)2009-671)	Investigation on Double Rayleigh Backscattering noise in fiber Raman amplifier	Kulwinder Singh	July, 2011
4.	Sukhbir Singh (Regd. No. UCE(P)2010-694)	Investigations on receiver sensitivity with semiconductor optical amplifiers in optical communication systems	Kulwinder Singh	July, 2012
5.	Anupjeet Kaur (Regd. No. 7141-11-1072)	Performance analysis of semiconductor optical amplifier(SOA) based wavelength converters in optical communication systems	Kulwinder Singh	August, 2013
6.	Chinky Rani (Regd. No. 7141-11-1090)	Performance analysis of broadband and Gigabit passive optical networks	Kulwinder Singh	August, 2013
7.	Prabhpreet Kaur (Regd. No.7141-11-1077)	Investigations of four wave mixing (FWM) mitigation techniques in multichannel optical communication systems	Kulwinder Singh	January, 2014
8.	Kamalbir Kaur (Regd. No. 7141-11-1078)	Investigations on characteristics of erbium doped fiber amplifier (EDFA) in wavelength division multiplexed optical communication systems	Kulwinder Singh	January, 2014
9.	Areet Aulakh (Regd. No. 7142-12-1359)	Investigations of wavelength converter based on semiconductor optical amplifier for all optical networks	Kulwinder Singh	July, 2014
10.	Amninder Singh(Regd. No. 7141-12-1380)	Design and analysis of minimum-phase FIR filter for efficient implementation	Kulwinder Singh	July, 2014
11.	AmritPal Singh(Regd. No.7141-12-1383)	Performance analysis of a bidirectional wavelength division multiplexing passive optical network using reflective Semiconductor optical amplifier (RSOA)	Kulwinder Singh	July, 2014
12.	Neetu Singh (Regd. No.	Investigations on injection current and	Kulwinder	February,

	(UCE(E)- 2008-134)	confinement factor of semiconductor optical amplifier in fiber optic communication systems	Singh	2015
13.	Shivani Sharma (Regd. No. 7141-13-1258)	A reversible data hiding scheme to embed high capacity data in two-dimensional difference histogram modification	Kulwinder Singh	November , 2015
14.	Supreet Singh (Regd. No. 7141-14-233)	Analysis and reduction of self-phase modulation fiber nonlinearity in optical fiber communication systems	Kulwinder Singh	August, 2016
15.	Sukhvir Kaur (Regd. No. 7141-13-1397)	Detection of packet dropping attack and privacy preserving by encryption algorithm in wireless adhoc networks.	Kulwinder Singh	August, 2016
16.	Kumar Sanu (Regd. No. 7141-13-1211)	Research on scale invariant feature transformation-based object detection	Kulwinder Singh	August, 2016
17.	Gagandeep Singh Walia, Roll No. 11592025	Performance Evaluation of Hybrid Raman-EDFA-Optical Amplifiers in Dense Wavelength Division Multiplexed Optical Transmission System.	Kulwinder Singh and Dr. Manjit Singh Bhamrah	July, 2017
18.	Arvinder Kaur Roll No. 11592058	Investigations on Gigabit Passive Optical Networks with Fiber Raman Amplifiers.	Kulwinder Singh	November , 2017
19.	Saurabh Maini, Regd. No. 7141-12-1172	Performance Analysis of Vertical Cavity Surface Emitting Lasers in Optical Transmission Systems.	Kulwinder Singh	March, 2018
20.	Gurkiran Kaur Roll No. 11792010	Analysis of Real Time GPON Monitoring for Fiber Faults with FBGs and EDFA.	Kulwinder Singh	November , 2019
21.	Kanchan Chaudhary, Roll No. 11792009	Design and Performance analysis of Subcarrier Multiplexed Radio over Fiber Optical Transmission System	Kulwinder Singh	December , 2019
22.	Shabnam Roll No. 11992004 Batch: 2019-2021	Characteristic Investigations on Raman/EDFA Hybrid Fiber Amplifier in Multichannel Optical Transmission System	Kulwinder Singh	December , 2022

Annexure (III): Details of Refresher Courses / Short Term Programs / Workshops Attended

S. No.	Name	Start Date	End Date	Organized By
1	Applied Electronics and Instrumentation.	Two weeks. 19/06/2000.	30/06/2000.	GNDEC, Ludhiana
2	Simulation Tools for Electronic system design.	One Day, 07/10/2002.		NIT, Jalandhar
3	Optical Communication, Emerging Trends its role and Technology application.	Two weeks, 31/03/2003.	11/04/2003.	PEC, Chandigarh
4	Virtual Instrumentation	Five Days,	01/08/2003.	NITTTR, Chandigarh

		28/07/2003		
5	Curriculum Process	Four Days, 23/09/2003	26/9/2003	NITTTR, Chandigarh
6	AUTOCAD	Five Days, 08/12/2003	12/12/2003	NITTTR, Chandigarh
7	HRD Prigame for Faculty.	Four Days, 23/09/2004	02/07/2004.	Indian Heritage Academy, (Bengaluru)
8	Digital Signal processing: Fundamentals, Algorithms & Applications	Two Days, 03/03/2005	4/3/2005	TIET, Deemed University, Patiala.
9	Satellite Communication, Application & Emerging Trends.	Two Weeks, 20/06/2005	1/7/2005	Career Institute of Technology & Management, Faridabad, Haryana.
10	Enhancing Pedagogy with Modern Technologies.	Two Weeks, 13/02/2006	24/02/2006	UIET, Punjab University, Chandigarh.
11	UGC Refresher Course on Advanced Signal Processing Technologies in wireless Communication.	Three Weeks, 04/12/2006	23/12/2006	TIET, Deemed University, Patiala.
12	MATLAB & SIMULINK for Engineer Education	One day, 20/04/2010		MATLAB India, Chandigarh
13	OFC System Design & Performance Evaluation.	One week, 23/08/2010	27/08/2010	NITTTR, Chandigarh
14	AICTE Recognized STC on Wireless Communication	One week 02/05/2016	06/05/2017	NITTTR, Chandigarh
15	AICTE Recognized STC on Repair and Maintenance of Electronics Measuring Instruments.	One week, 09.01.2017	13.01.2017	NITTTR, Chandigarh
16.	Embedded Systems	(One Week) 17/09/2018	21/09/2018	NITTTR, Chandigarh
17.	Python Language Programming	One day workshop, 01/10/2018		Deptt. of ECE, Punjabi University Patiala
18.	Microcontrollers and its Applications	(One Week) 07/01/2019	11/01/2019	Deptt. of ECE, Punjabi University Patiala
19.	Enabling Technologies for Wireless and Optical Networks”	(One Week), 10/06/ 2019	15/06/2019	GNDEC, Ludhiana
20.	Confidential Workshop	(One week), 14/08/2019	14/08/2019	NTA, GOI, Noida, NCR
21.	Microcontrollers and Embedded Systems	(Two Weeks)25/11/2019	06/12/2019	NITTTR, Chandigarh
22.	Biomedical Applications	(One Week) 24-02-20	28-02-20	NITTTR, Chandigarh

23.	Teaching and Learning post Covid-19.	One Day Webinar 29/04/2020	-----	Department of ECE, Punjabi University Patiala
24.	Entrepreneurial Career opportunities, Conducted by Entrepreneurship Development and Industrial Coordination Department of NITTTR, Chandigarh.	One week, 17/10/2022	21/10/2022	Department of ECE, Punjabi University Patiala
25.	IOT and its Applications conducted by Electronics and Communication Engineering Department of NITTTR, Chandigarh.	One week, 5/12/2022	9/12/2022	Department of ECE, Punjabi University Patiala