Dr. Badam Singh Kushvah
Professor
Department of Mathematics and Computing
IIT(ISM), Dhanbad -826004, Jharkhand (India)
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Present Position

- Professor, Department of Mathematics and Computing,IIT(ISM) Dhanbad

Teaching & Research Experience: More than 16 Years

Date of Birth:01/01/74

Qualifications

- **B.R.A. Bihar University Muzaffarpur (Bihar)**

    - **Ph.D.** in Mathematics (Faculty of Science) $\hfill$ August 2007
      Thesis title: *Stability of Equilibrium Points in the Generalised Photogravitational Restricted Three Body Problem with Poynting-Robertson Drag.*
    - **PGDCA** 79.80%(718/900), Grade A, $\hfill$ 2004
      Project title: *Symposium/Seminar/ Workshop*

- **CSIR-UGC**

    - NET(Mathematical Science) -Lecturer ship $\hfill$ December 2002

- **Barkatullah University Bhopal (M.P.)**

    - **M.Sc. (Mathematics)** $\hfill$ April-May, 2000
      Second Position in the University Examination
      First Class with 76.88%(615/800)
      Special Papers: Numerical Analysis, Integral Transform with Applications, Special Functions
    - **B.Sc. (Physics, Chemistry and Mathematics)** $\hfill$ March-April 1998
      First Class with 73.67%(1326/1800)

- **Board of Secondary Education Madhya Pradesh, Bhopal**

    - **Higher Secondary School Certificate (HSSC)-12**th $\hfill$ March 1995
      First Division with 60% (270/450)

– **High School Certificate (HSC)-10**th March 1993
First Division with 62.31% (405/650)

- **4 M.P. Battalion NCC, Bhopal (M.P.)**

  – **NCC A** Certificate   1993

Research Credentials

- Guided (a) Ph.D. : 10(awarded), 5(ongoing) (b) M.Phil-4

- Research Papers Published(in SCI/SCIE) Journals: 43

Research Interests

- Specialization: Orbital Mechanics and Dynamical Astronomy.

- Present research areas: Solar and Exoplanetary systems,Halo/Lissajous orbits computations, Trajectory design and Transfer, GPU Computing, N-Body Simulations, Near Earth Asteroids(NEOs).

Project Details

- Computation of Effective Stability in the Generalised Photogravitational Chermnykh-Like Problem funded by IIT(ISM) Dhanbad, MRP Project. No. 2010/MRP/AM/04/Acad, from 30/06/2010 to 29/06/2012. total fund Rs. 1,00,000/-

- Analysis of Effective Stability around the Equilibrium Points in the Generalized Photogravitational Chermnykh-like Problem funded under SERC Fast Track Scheme for Young Scientist in Physical Sciences, D.O. No. SR/FTP/PS-121/2009, duration from 04/10/2010 03/10/2013, total Amount Rs. 12,84,000/-

- Stability and Chaos in Photogravitational N-body problem with Solar Wind Drag funded by ISRO, DOS, Govt. of India under RESPOND scheme, D .O. No. ISRO/RES/2/383/2012-13, duration from 11/06/2013 to 10/06/2016, total fund Rs. 16, 97,000/-

- Energy Efficient Trajectory Design for Space Missions funded by SERB(DST), Govt. of India, Do. No. EMR/2016/001145, dste of start 21/03/2017 to 20/03/2020, total fund Rs.23,85,020/-

- NVIDIA Corporation under GPU Education Centre, approved on 02/07/2014 to 31/12/2017, Total fund $2500, five GPU Cards, two books(Rs.1,48,814/-), GeForce GTX TITAN X GPU($863.50) and GPU Teaching Tool kits donated by NVIDIA.

Awards

- Best Poster Presentation Award of 93rd Indian Science Congress Year 2005-2006

- Canara Bank Research Publication Award-2015, IIT(ISM) Dhanbad

- Canara Bank Research Publication Award-2016, IIT(ISM) Dhanbad

Publications in the International Journals and SCIE or ESCI
http://arxiv.org

1. Verma, R. K., Kushvah, B. S., Mahato, G., Pal, A. K., 2023a. Perturbed restricted problem of three bodies with elongated smaller primary. The Journal of the Astronautical Sciences 70 (3), 1–26

2. Verma, R. K., Pal, A. K., Kushvah, B. S., Mahato, G., 2023b. Effect of finite straight segment and oblateness in the restricted 2+ 2 body problem. Archive of Applied Mechanics 93 (7), 2813–2829

3. Kumar, V., Kushvah, B. S., 2022. The transfer trajectory onto the asteroid for mining purposes using lpg-algorithm. In: Nonlinear Dynamics and Applications: Proceedings of the ICNDA 2022. Springer International Publishing Cham, pp. 633–648

4. Mahato, G., Kushvah, B. S., Pal, A. K., Verma, R. K., 2022a. Dynamics of the restricted three-body problem having elongated smaller primary with disc-like structure. Advances in Space Research 69 (9), 3490–3501

5. Mahato, G., Pal, A. K., Alhowaity, S., Abouelmagd, E. I., Kushvah, B. S., 2022b. Effect of the planetesimal belt on the dynamics of the restricted problem of 2 + 2 bodies. Applied Sciences 12 (1).
URL https://www.mdpi.com/2076-3417/12/1/424

6. Kumar, V., Kushvah, B. S., Bando, M., 2022. An alternative opportunity of future psyche mission using differential evolution and gravity assists. AIMS Mathematics 7 (4), 7012–7025

7. Yadav, A. K., Kushvah, B. S., Dolas, U., 2021b. Controlling the libration point orbits for crtbp with non-ideal solar sail and albedo effect. Chaos, Solitons & Fractals 152, 111387.
URL https://www.sciencedirect.com/science/article/pii/S0960077921007414

8. Srivastava, V. K., Mishra, P., Ramakrishna, B., Kushvah, B., 2021. Orbit prediction and earth shadow modeling for chandrayaan-2 orbiter. Astrophysics and Space Science 366 (8), 1–12

9. Yadav, A., Kushvah, B., Dolas, U., 2021a. Station-keeping error analysis for halo orbits around libration point l1 using linear control logic. Astronomy and Computing 35, 100462

10. Kumar, V., Kushvah, B. S., Mar. 2020. Computation of Periodic Orbits around L_1 and L_2 using PSO Technique. Astronomy Reports 64 (1), 82–93

11. Yadav, A. K., Kushvah, B. S., Dolas, U., Dec. 2018. Lissajous motion near Lagrangian point L_2 in radial solar sail. Journal of Astrophysics and Astronomy 39 (6), 72

12. Srivastava, V. K., Kumar, J., Mishra, P., Kushvah, B. S., Oct. 2018b. Halo orbit of regularized circular restricted three-body problem with radiation pressure and oblateness. Journal of Astrophysics and Astronomy 39 (5), 63

13. Tiwary, R. D., Kushvah, B. S., Ishwar, B., Jun. 2018. Trajectory of asteroid 2017 SB20 within the CRTBP. Journal of Astrophysics and Astronomy 39 (3), 29

14. Vaishwar, A., Kushvah, B. S., Mishra, D. P., Jan. 2018. Secular Effect of Sun Oblateness on the Orbital Parameters of Mars and Jupiter. Few-Body Systems 59 (1), 4

15. Srivastava, V. K., Kumar, J., Kushvah, B. S., Jan. 2018a. Halo orbit transfer trajectory design using invariant manifold in the Sun-Earth system accounting radiation pressure and oblateness. Ap&SS363 (1), 17

16. Kishor, R., Kushvah, B. S., Sep. 2017. Normalization of Hamiltonian and nonlinear stability of the triangular equilibrium points in non-resonance case with perturbations. Ap&SS362, 156

17. Deo, S. N., Kushvah, B. S., Jul. 2017. Yarkovsky effect and solar radiation pressure on the orbital dynamics of the asteroid (101955) Bennu. Astronomy and Computing 20, 97–104

18. Srivastava, V. K., Kumar, J., Kushvah, B. S., Mar. 2017. Regularization of circular restricted three-body problem accounting radiation pressure and oblateness. Ap&SS362, 49

19. Srivastava, V. K., Kumar, J., Kushvah, B. S., Dec. 2016b. The effects of oblateness and solar radiation pressure on halo orbits in the photogravitational Sun-Earth system. Acta Astronautica 129, 389–399

20. Mia, R., Kushvah, B. S., Sep. 2016b. Stability and Fourier-Series Periodic Solution in the Binary Stellar Systems. Few-Body Systems 57, 851–867

21. Mia, R., Kushvah, B. S., Mar. 2016a. Orbital dynamics of exoplanetary systems Kepler-62, HD 200964 and Kepler-11. MNRAS457, 1089–1100

22. Srivastava, V. K., Kumar, J., Kulshrestha, S., Kushvah, B. S., Jan. 2016a. Mars solar conjunction prediction modeling. Acta Astronautica 118, 246–250

23. Srivastava, V. K., Kumar, J., Kulshrestha, S., Kushvah, B. S., Bhaskar, M. K., Somesh, S., Roopa, M. V., Ramakrishna, B. N., Aug. 2015a. Eclipse modeling for the Mars Orbiter Mission. Advances in Space Research 56, 671–679

24. Tiwary, R. D., Kushvah, B. S., May 2015. Computation of halo orbits in the photogravitational Sun-Earth system with oblateness. Ap&SS357, 73

25. Srivastava, V. K., Kumar, J., Kulshrestha, S., Srivastava, A., Bhaskar, M. K., Kushvah, B. S., Shiggavi, P., Vallado, D. A., May 2015b. Lunar shadow eclipse prediction models for the Earth orbiting spacecraft: Comparison and application to LEO and GEO spacecrafts. Acta Astronautica 110, 206–213

26. Srivastava, V. K., Yadav, S. M., Ashutosh, Kumar, J., Kushvah, B. S., Ramakrishna, B. N., Ekambram, P., Mar. 2015c. Earth conical shadow modeling for LEO satellite using reference frame transformation technique: A comparative study with existing earth conical shadow models. Astronomy and Computing 9, 34–39

27. Pal, A. K., Kushvah, B. S., Jan. 2015. Geometry of halo and Lissajous orbits in the circular restricted three-body problem with drag forces. MNRAS446, 959–972

28. Kumari, R., Kushvah, B. S., Feb. 2014. Stability regions of equilibrium points in restricted four-body problem with oblateness effects. Ap&SS349, 693–704

29. Kishor, R., Kushvah, B. S., Dec. 2013a. Linear stability and resonances in the generalized photogravitational Chermnykh-like problem with a disc. MNRAS436, 1741–1749

30. Kishor, R., Kushvah, B. S., Aug. 2013b. Lyapunov characteristic exponents in the generalized photo-gravitational Chermnykh-like problem with power-law profile. Planet. Space Sci.84, 93–101

31. Kumari, R., Kushvah, B. S., Apr. 2013. Equilibrium points and zero velocity surfaces in the restricted four-body problem with solar wind drag. Ap&SS344, 347–359

32. Kishor, R., Kushvah, B. S., Apr. 2013c. Periodic orbits in the generalized photogravitational Chermnykh-like problem with power-law profile. Ap&SS344, 333–346

33. Kushvah, B. S., Kishor, R., Dolas, U., Jan. 2012. Existence of equilibrium points and their linear stability in the generalized photogravitational Chermnykh-like problem with power-law profile. Ap&SS337, 115–127

34. Kushvah, B. S., May 2011a. Trajectories of L $_4$ and Lyapunov Characteristic Exponents in the Generalized Photogravitational Chermnykh-Like problem. Ap&SS333, 49–59

35. Kushvah, B. S., Mar. 2011b. Trajectory and stability of Lagrangian point L $_2$ in the Sun-Earth system. Ap&SS332, 99–106

36. Kushvah, B. S., Sep. 2009. Linearization of the Hamiltonian in the generalized photogravitational Chermnykh's problem. Ap&SS323, 57–63

37. Kushvah, B. S., 2009. Poynting–robertson effect on the linear stability of equilibrium points in the generalized photogravitational chermnykh's problem. Research in Astronomy and Astrophysics 9 (9), 1049

38. Kushvah, B. S., Nov. 2008a. Linear stability of equilibrium points in the generalized photogravitational Chermnykh's problem. Ap&SS318, 41–50

39. Kushvah, B. S., Jun. 2008b. The effect of radiation pressure on the equilibrium points in the generalized photogravitational restricted three body problem. Ap&SS315, 231–241

40. Kushvah, B. S., Sharma, J. P., Ishwar, B., Dec. 2007b. Nonlinear stability in the generalised photogravitational restricted three body problem with Poynting-Robertson drag. Ap&SS312, 279–293

41. Kushvah, B. S., Sharma, J. P., Ishwar, B., Oct. 2007c. Normalization of Hamiltonian in the Generalized Photogravitational Restricted Three Body Problem with Poynting Robertson Drag. Earth Moon and Planets 101, 55–64

42. Kushvah, B. S., Sharma, J. P., Ishwar, B., 2007a. Higher order normalizations in the generalized photogravitational restricted three body problem with Poynting-Robertson drag. Bulletin of the Astronomical Society of India 35

43. Ishwar, B., Kushvah, B., 2006. Linear stability of triangular equilibrium points in the generalized photogravitational restricted three body problem with poynting_robertson drag. Journal of Dynamical Systems and Geometric Theories 4 (1), 79–86

Publications in the International Journals Non SCIE/ESCI

1. Tiwary, R., Srivastava, V., Kushvah, B., 2018. Computation of three-dimensional periodic orbits in the sun-earth system. Phys. Astron. Int. J 2 (1), 98–107

Publications in the International Conferences/proceedings

1. Kumar, V., Kushvah, B. S., 2022. The transfer trajectory onto the asteroid for mining purposes using lpg-algorithm. In: Nonlinear Dynamics and Applications: Proceedings of the ICNDA 2022. Springer International Publishing Cham, pp. 633–648

2. Yadav, A. K., Kushvah, B. S., 2022. Controlling the libration motion of tethered satellite system using sliding mode control scheme. In: AIP Conference Proceedings. Vol. 2435. AIP Publishing LLC, p. 020052

3. Deo, S. N., Kushvah, B. S., 2022. Orbital dynamics of the near-earth asteroids (399457) 2002 pd43,(196256) 2003 eh1 and (489900) 2008 kp. In: AIP Conference Proceedings. Vol. 2435. AIP Publishing LLC, p. 020029

4. Vaishwar, A., Mishra, D. P., Kushvah, B. S., Jan. 2019. Radiation influence on stability of triangular points in elliptic restricted three-body problem. In: American Institute of Physics Conference Series. Vol. 2061 of American Institute of Physics Conference Series. p. 020001

Publications in the National Conferences

1. Kushvah, B. S., 2011. Trajectories and stability regions of the lagrangian points in the generalized chermnykh-like problem. In: Mathematics In Science And Technology: Mathematical Methods, Models and Algorithms in Science and Technology. pp. 499–509

2. KT, S., Kushvah, B., Ishwar, B., 2006. Stability of triangular equilibrium points in robe's generalised restricted three body problem. Celestial Mechanics: Recent Trends, 65

3. Tripathi, D. K., Kushvah, B., Ishwar, B., 2006. Stability of triangular equilibrium points in the generalized photogravitational restricted three body problem with poynting–roberston drag. Celestial Mechanics: Recent Trends, 27

Delivered Expert Lectures

1. Delivered expert Lecture on "Linear Algebra and Applications"in one-week Hands-on Training Workshop on Mathematical Methods with Applications Under DST-STUTI PROGRAMME from 14th 20th March 2023

2. Delivered two expert lectures on (a) "Artificial Neural Network (ANN) for Asteroids Classification"and (b) "Computation of invariant manifolds and trajectory transfer in CRTBP"in the International Workshop on Celestial Mechanics and Dynamical Astronomy (IWCMDA-2023)" held the Department of Mathematics, Central University of Rajasthan during 06 - 08 January, 2023.

3. Delivered invited lecture "Classification of Asteroids using Optimization Algorithms of Machine Learning"in the Section of Mathematical Sciences (including Statistics) at the 108th Indian Science Congress held f at Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur from January 3 to 7, 2023.

4. Expert Lecture on "Calculus and machine learning"in the Training program "STUTI on Mathematics for Machine learning" organized by DST-Centre for Interdisciplinary Mathematical Sciences, Institute of Science, Banaras Hindu University,Varanasi from 19-09-2022 to 25-09-2022.

5. Delivered keynote address on "Particle Swarm Optimization (PSO) with invariant manifolds for Earth to Halo orbit trajectory transfer"the International Conference on Computational Mathematics in Nanoelectronics and Astrophysics (CMNA 2018) from 01-03, November 2018 at IIT Indore.

6. Expert Lecture on CUDA FORTRAN in workshop on "Numerical and Computational Methods for Fluid Solid Interaction Problems"during Sept 27 -28, 2018, IIT(ISM) Dhanbad.

7. Expert lectures on CUDA FORTRAN and GNU Plot in Science Academy Refresher Course on "Concept of Fluid Dynamics and Applications", June 25 - July 06, 2018,at IIT (ISM) Dhanbad.

8. Lecture on Initial Conditions using Particle Swarm Optimization for Periodic Orbits in the symposium on Promotion of Space Science through Education and Research organized in Mathematical Sciences Section (including Statistics), 105th Indian Science Congress, from 16 to 20 March, 2018 at Manipur Central University, Imphal.

9. Expert lectures on "Basics of MATHEMATICA"during National Training Programme in Scientific Computing with MATHEMATICA, organized by Faculty Development Centre, December 04-09, 2017, IIT (ISM) Dhanbad.

10. Contributory talk on "Normalization Theory with Applications in Celestial Mechanics"during the Summer School on Satellite Dynamics and Space Missions: Theory and Applications of Celestial Mechanics(SDSM2017), San Martino al Cimino, Viterbo, Italy, August 28 - September 2, 2017, Italy.

11. Expert Lectures delivered on "Normalization and Lyapunov Characteristic Exponents"during a Training Programme on Dynamical Systems: Theory & Applications (DSTA 2017), May 08-12,2017, IIT(ISM) Dhanbad.

12. Expert Lecture on "Normalization"during the Short Term Course on Dynamical Systems: Theory & Applications (DSTA 2016), June 26-30, 2016 IIT(ISM) Dhanbad.

13. Expert Lectures delivered on "Series solutions, Frobenius method,Examples"during the Science Academies Refresher Course on Differential Equations and their Applications in Science and Engineering (DEASE-2016), July 04-16, 2016, IIT(ISM) Dhanbad.

14. Invited talk entitled "Normalization for Dynamical Systems"during one week Short Term Course on Role of Mathematical Sciences in Engineering and Technology (RMSET-16), Organized by Department of Mathematics, MNNIT Allahabad, October 19-23, 2016, Allahabad.

15. Invited talk entitled "Normalization of Vector Fields: Theory and Applications"during the International Conference on Celestial Mechanics & Dynamical Astronomy(ICCMDA), organized by Maulana Azad National Urdu University, Hyderabad, December 15-17, 2015, Hyderabad.

16. Invited Expert Lectures delivered in a short term course on Ordinary and Partial Differential Equation: Analysis and Applications" under TEQIP-II from 27-31 May, 2014 at Department of Mathematics and Computer Applications, Maulana Azad National Institute of Technology, Bhopal.

17. Invited talk in 99th session of Indian Science Congress,Jan 3-7, 2012 at KIIT, Bhubaneswar.

Presented Research Paper(s) in more than 50 Conferences/Seminars

Abroad Visits

- Oral presentation in the 38th COSPAR Scientific Assembly, 18 - 25 July 2010, the Congress Center Bremen, Buergerweide 1, 28215, Bremen, Germany.

- Oral presentation in the 40th COSPAR Scientific Assembly, 02 - 10 August 2014, Lomonosov Moscow State University, Russia.

- Summer School on Satellite Dynamics and Space Missions: Theory and Applications of Celestial Mechanics(SDSM2017), August 28 - September 2, 2017, and the Seventh International Meeting on Celestial Mechanics(CELMEC-VII), September 03-09,2018, San Martino al Cimino, Viterbo, Italy.

Reviewer

1. Astrophysics and Space Science, Springer.

2. Advances in Space Research, Elsevier.

3. Acta Astronautica,Elsevier.

4. International Journal of Astronomy and Astrophysics (IJAA),Scientific Research Publishing.

5. SERB Research Projects.

6. Ph.D Theses.

Outreach Programme Organized

1. Workshop on Mathematical Methods & Astronomy (WMMA 2013), February 07-09, 2013,Sponsored by Inter-University Centre for Astronomy and Astrophysics (IUCAA), Pune, Coordinators: Dr Badam Singh Kushvah(ISM) & Prof. Ranjan Gupta(IUCAA).

2. Workshop on High Performance Computing (WHPC-2015), July 29-31, 2015, IIT(ISM) Dhanbad, Coordinator: Dr. B. S. Kushvah & Convener: Dr. M. K. Singh, Sponsored by MOES Govt. of India, NVIDIA/ Lenevo

3. Sort Term Course on Dynamical Systems: Theory and Applications (DSTA 2016), June 26-30, 2016, IIT(ISM) Dhanbad,Sponsored by SERB Govt. of India, IUCAA Pune, Coordinator: Dr. B. S. Kushvah & Dr. Kanak Saha(IUCAA Pune),

4. Training Programme on Dynamical Systems: Theory & Applications (DSTA 2017), May 08-12, 2017. IIT(ISM) Dhanbad, self sponsored programme, Coordinators: Dr. B. S. Kushvah & Dr. M.K. Singh

5. Training Programme on Dynamical Systems: Theory & Applications (DSTA 2018), September 04-08, 2018. IIT(ISM) Dhanbad, Coordinators: Dr. B. S. Kushvah & Dr. M.K. Singh

Life Membership

- Calcutta Mathematical Society (CMS), Kolkata.

- Indian Society of Theoretical & Applied Mechanics (ISTAM), IIT Kharagpur.

- Astronomical Society of India(ASI).

- Indian Society of Industrial and Applied Mathematics (ISIAM), India.

- The Indian Science Congress Association(ISCA), Kolkata, India.

- Society of Applied Mathematics (SAM), ISM Dhanbad.

- Indian Mathematical Society(IMS),Pune, India.

Fellowships

- **Rashtriya Pratibha Khoj** (1992 - 1995) First position in, Block Sironj, District Vidisha, M.P.

- **Junior Research Fellow** in D.S.T. Project [DST/MS/140/2K] from May 5, 2003 to February 15, 2007 in the University Department of Mathematics, B.R.A. Bihar University Muzaffarpur (Bihar).
  Project Title: *Studies of Stability in Generalised Photogravitational Restricted Three Body Problem with Poynting-Robertson Drag.*

Teaching Experience Details:

1. Professor, Department of Mathematics and Computing,IIT(ISM) Dhanbad, since 17-08-2023.

2. Associate Professor, Department of Mathematics and Computing,IIT(ISM) Dhanbad, from 03-12-2014 to 17-08-2023.

3. Assistant Professor, Department of Applied Mathematics,IIT(ISM) Dhanbad, from 18/05/2009 to 02/12/2014.

4. Lecturer (Assistant Professor), Department of Mathematics, National Institute of Technology (NIT), G.E. Road Raipur (C.G.) from 23/07/2008 to 16/05/2009.

5. Reader of Mathematics, Gwalior Engineering College (GEC) Airport Road, Maharajpura, Gwalior (M.P.) form 10/07/2007 to 21/07/2008.

Administrative/other Experience

1. Associate Dean (Network and Systems), from 04/01/2019 to 09/04/2023.

2. Test Centre Administrator (TCA) JEE(Advanced) Examination, held on October 03, 2021 at IIT(ISM) Dhanbad Centre.

3. Centre Head (CH)/Presiding Officer(PO), JEE(Advanced) Examination, held on September 27, 2020 at IIT(ISM) Dhanbad Centre.

4. Member GATE-JAM committee(earlier: MPhil (2012,2013)/ M. Tech Admission Entrance Exam/ Admission) from 12/08/2012 to 13/10/2019.

5. Visiting Associate of Inter-University Centre for Astronomy and Astrophysics(IUCAA) from 01/08/2010 to 31/07/2019.

6. Warden Jasper Hostel from 11/12/2013 to 31/05/2018.

7. In-charge, Time- Table of the Department, Winter session 05/12/2013 to 26/09/2018.

8. Computer Lab In-charge of the Department from 8/04/2010 to 26/09/2018.

9. Sectional Recorder of Mathematical Sciences (including Statistics) for 2016-2017 & 2017-2018 (104th & 105th Sessions) of the Indian Science Congress Association, Kolkata. 14/01/2016 to 13/01/2018

10. Faculty Advisor, Astronomy Club, IIT(ISM) Dhanbad, since 09/08/2018 to January 2022

11. Faculty Advisor of Integrated M. Tech(M&C) 2018 Batch.

12. Treasurer, Society of Applied Mathematics(SAM). Since 27/09/2018 to continue.

13. Member 89th (2014); 90th (2015), 93rd(2018- School children visit), 94th(2019) Foundation Day organizing committees.

14. I/II-B.Tech Examination coordinator from 2013 to 2018.

Skills:CUDA C & C++, CUDA FORTRAN/Python, LATEX, Unix/Linux and Machine Learning

1. Successfully Completed an online non-credit course **Machine Learning - by Andrew Ng**, authorized by Stanford University, and offered through Coursera (17/07/2020).

2. Successfully Completed an online non-credit course **Neural Networks and Deep Learning-by Andrew Ng**, authorized by deeplearning.ai and offered through Coursera(11/08/2020).

3. Successfully Completed an online non-credit course **Programming for Everybody (Getting Started with Python) -by Charles Russell Severance**, authorized by the University of Michigan through Coursera(14/09/2020).

(Badam Singh Kushvah)

Dhanbad: August 18, 2023