Bio-data

Dr. Rajanna T Ph.D.

Assistant Professor

Department of Civil Engineering,
B.M.S. College of Engineering,
Bull Temple Road, Hanumanthanagar,
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(I) EDUCATIONAL QUALIFICATIONS:

Degree	Specialization	Year of passing/class	University
Ph.D	Structural Engineering	2017	IIT, Bombay
M.Tech	Computer Aided Design of Structures	2006	Visvesvaraya Technological University
B.E	Civil Engineering	2004	Visvesvaraya Technological University

(II) PROFESSIONAL EXPERIENCE:

Name of the Employer	Designation/Position	From	To
National Aerospace Limited	Design Engineer	June 2006	November 2006
Dayanand Sagar College of Engineering	Lecturer	December 2006	June 2007
B.M.S. College of Engineering	Assistant Professor	July 2007	Till date

(III) COURSES TAUGHT/TEACHING INTERESTS:

Name of the program	Course Title
UG Civil Engineering	Engineering Mechanics
	Strength of Materials
	Structural Analysis
	Indeterminate Structural Analysis
	Matrix Method of Structural Analysis
	Theory of Elasticity
	Finite Element Modeling and Analysis
	Mechanics of FRP Composites
	Structural Dynamics
	Design of RC Structures
	Advanced design of RC Structures
	Estimation and Costing
	Building Materials and Constructions

(IV) R& D ACTIVITIES:

A) AREAS OF RESEARCH:

1. **Finite Element Modeling of Structural Elements**
2. **Laminated Composite Structures**
3. **Functionally Graded Materials**
4. **Structural Stability and Dynamics**

B) RESEARCH WORK DURING Ph.D:

Dynamic Instability Characteristics of Laminated Composite Stiffened Panels with Cutouts Subjected to Non-uniform and Localized In-plane Edge Loads

C) PUBLICATIONS DETAILS:

	Total
Published in International Journals (Peer reviewed)	45
Published in National Journals	-
Presented in International Conferences	10
Presented in national Conferences/Seminars/ Symposia	-

Publications in International Journals:

1. **Rajanna T**., Banerjee S., Desai Y.M., and Prabhakara D.L., **(2016)**, "Vibration and buckling analyses of laminated panels with and without cutouts under compressive and tensile edge loads", ***Steel and Composite Structures, 21(1), 37-55.*** https://doi.org/10.12989/SCS.2016.21.1.037.

2. **Rajanna T**., Banerjee S., Desai Y.M., and Prabhakara D.L., **(**2016**)**, "Effects of Partial Edge Loading and Fibre Configuration on Vibration and Buckling Characteristics of Stiffened Composite Plates", ***Latin American Journal of Solids and Structures, 13(5), 854-879.*** doi: 10.1590/1679-78252239.

3. **Rajanna T**., Banerjee S., Desai Y.M., and Prabhakara D.L., (2017), "Effect of boundary conditions and non-uniform edge loads on the buckling characteristics of laminated composite panels with and without cutout", ***International Journal for Computational Methods in Engineering Mechanics, (Taylor & Francis Group),*** **18(1), 64-76.** https://doi.org/10.1080/15502287.2016.1276350

4. **Rajanna T**., Banerjee S., Desai Y.M., and Prabhakara D.L., (2018), "Effect of reinforced cutouts and ply-orientations on buckling behavior of composite panels subjected to non-uniform edge loads", ***Internal Journal of Structural Stability and Dynamics*****. 18(4), 1850058.** https://doi.org/10.1142/S021945541850058X

5. KS, S. C., **Rajanna, T**., & Rao, K. V. (2020). A Parametric study on the effect of elliptical cutouts for buckling behavior of composite plates under non-uniform edge loads. ***Latin American Journal of Solids and Structures, 17(8), 1-14.*** https://doi.org/10.1590/1679-78256225.

6. Maharudra, R., Arya, B., & **Rajanna, T**. (2020). Effect of ply-orientation and boundary conditions on the vibrational characteristics of laminated composite plates using HOSDST. ***Materials Today, 20, 134-139.***https://doi.org/10.1016/j.matpr.2019.10.062

7. Muddappa, P. Y., **Rajanna, T**., & Giridhara, G. (2021). Effects of different interlaminar hybridization and localized edge loads on the vibration and buckling behavior of fiber metal composite laminates. ***Composites Part C, 4, 100084.*** doi.org/10.1016/j.jcomc.2020.100084.

8. Muddappa, P. Y., Giridhara, G., & **Rajanna, T**. (2021). Buckling behavior of GLARE panels subjected to partial edge loads. ***Materials Today, 45, 94-99.*** https://doi.org/10.1016/j.matpr.2020.10.099

9. **Maharudra, R., Rajanna, T**., & Arya, B. (2021). Influence of Trapezoidal Shapes and Cutout Sizes on the Buckling Behaviour of Composite Laminates under Thermally Induced Loads. ***Latin American Journal of Solids and Structures, 18.*** https://doi.org/10.1590/1679-78256331.

10. Muddappa, P. Y., Giridhara, G., & **Rajanna, T**. (2021). Buckling behavior of interlaminar hybrid fiber metal laminate (HFMLs) subjected to uniaxial compressive loading. ***Materials Today, 45, 128-132.*** https://doi.org/10.1016/j.matpr.2020.10.111.

11. Chandra, K. S., **Rajanna, T**., & Venkata Rao, K. (2021). Hygro-thermo-mechanical vibration and buckling analysis of composite laminates with elliptical cutouts under localized edge loads. ***International Journal of Structural Stability and Dynamics, 2150150.*** doi:10.1142/S0219455421501509.

12. Muddappa, P. Y., **Rajanna, T**., & Giridhara, G. (2021). Effect of Compression and Tension Types of Concentrated Edge Loads on Buckling and Vibration Behavior of Interlaminar Hybrid Fibre Metal Laminates. ***Composites Part C, 100167.*** https://doi.org/10.1016/j.jcomc.2021.100167

13. Swaminathan, K., Sachin, H., & **Rajanna, T**. (2021). Buckling analysis of functionally graded materials by dynamic approach. ***Materials Today, 45, 172-178.*** https://doi.org/10.1016/j.matpr.2020.10.412

14. Maharudra, R., **Rajanna, T**., & Arya, B. (2021).Thermal Buckling Behaviours of Laminated Composite Trapezoidal Panel under Thermally Induced Loads. American Journal of Materials Science, 11(1), 10-19. https://doi:10.5923/j.materials.20211101.02

15. Chandra, K. S., **Rajanna, T**., & Rao, K. V. (2021). Effect of sinusoidal and inverse sinusoidal In-plane loads on buckling and vibration characteristics of FRP panels with cutouts. ***Materials Today, 45, 48-53.*** https://doi.org/10.1016/j.matpr.2020.09.231

16. Maharudra, R., **Rajanna, T**., & Arya, B. (2021). Effect of trapezoidal shapes on the thermal buckling behaviour of perforated composite plates. ***Advances in Materials Science, 21(1), 10-26.*** doi:10.2478/adms-2021-0002.

17. Chandra, K. S., Rao, K. V., & **Rajanna, T**. (2021). Effect of Varying In-Plane Loads and Cutout Size on Buckling Behavior of Laminated Panels. Advances in Mechanical Engineering. ***Lecture Notes in Mechanical Engineering. Springer, Singapore.*** https://doi. org/10.1007/978-981-15-3639-7_80.

18. Muddappa, Y. P., **Rajanna, T**., & Giridhara, G. (2021). Effect of nonlinear edge loads and hybridization of FMLs on buckling performance of interlaminar composites with/without cutouts. ***Proceedings of the Institution of Mechanical Engineers, Part C: Journal of Mechanical Engineering Science, 09544062211037367.*** https://doi.org/10.1177/09544062211037367

19. **Rajanna, T**., & Gowda, V. M. (2021). Effect of non-uniform in-plane bending and edge conditions on the stability behaviour of laminated panels with and without cutouts. ***Materials Today, 45, 156-160.*** https://doi.org/10.1016/j.matpr.2020.10.402

20. **Rajanna, T**., & Gowda, V. M. (2021). Dynamic behaviour of perforated laminated panels under biaxial non-uniform edge loads based on FE approach. ***Materials Today, 45, 179-183.*** https://doi.org/10.1016/j.matpr.2020.10.413

21. Yathish Muddappa, P. P., **Rajanna, T**., & Giridhara, G. (2021). Effect of tensile and compressive nonlinear edge loads on the buckling performance of hybrid metal composite laminates with cutouts. ***Mechanics Based Design of Structures and Machines, 1-19.*** https://doi.org/10.1080/15397734.2021.1956331

22. Maharudra, R., **Rajanna, T**., & Arya, B. (2021). Influence of Trapezoidal Shapes and Linearly varying Edge Loads on the Buckling Characteristics of Plates with Cutouts. ***Journal of the Institution of Engineers (India): Series C, 1-19.*** https://doi.org/10.1007/s40032-021-00735-2

23. Muddappa, P. Y., Giridhara, G., & **Rajanna, T**. (2021). Effect of localized edge loads on the buckling behaviour of hybrid fibre metal laminates. Materials Today, 46(18), 9054-9058. https://doi.org/10.1016/j.matpr.2021.05.387

24. Swaminathan, K., Sachin, H., & **Rajanna, T**. (2021). Effect of initial stresses on vibration behavior of functionally graded materials. Materials Today, 45(1), 240-245. doi.org/10.1016/j.matpr.2020.10.430.

25. Yathish Muddappa, P. P., **Rajanna, T**., & Giridhara, G. (2021). Effect of reinforced cutouts on the buckling and vibration performance of hybrid fiber metal laminates. ***Mechanics Based Design of Structures and Machines, 1-21.*** doi.10.1080/15397734.2021.1948862.

26. Chandra, K. S., **Rajanna, T**., & Rao, K. V. (2021). Effect of position of partial load on buckling and vibration characteristics of composite panels with circular cutouts. ***Materials Today, 45(1), 41-47.*** https://doi.org/10.1016/j.matpr.2020.09.229

27. Muddappa, P. Y., **Rajanna, T**., & Giridhara, G. (2021). Effects of different interlaminar hybridization and cutout sizes on the vibration and buckling characteristics of fiber metal composite laminates under partial edge loads. ***Proceedings of the Institution of Mechanical Engineers, Part C: Journal of Mechanical Engineering Science, 09544062211002876.*** https://doi.org/10.1177/09544062211002876

28. Maharudra, R., Arya, B., & **Rajanna, T**. (2021). Effect of trapezoidal shaped laminated composite plate with and without cutout on vibration characteristics. ***Materials, 45(1), 34-40.*** https://doi.org/10.1016/j.matpr.2020.09.228

29. Maharudra, R., Arya, B., & **Rajanna, T**. (2021). Buckling behaviour of composite laminates of trapezoidal panel with cutout subjected to non-uniform in-plane edge loads. ***Materials Today, 45, 21-26.*** https://doi.org/10.1016/j.matpr.2020.09.224

30. Narayanan, N. I., Banerjee, S., Kalgutkar, A. P., & **Rajanna, T**. (2021). Vibration Analysis of Functionally Graded Material Plate. ***In Recent Advances in Computational Mechanics and Simulations (pp. 119-130). Springer, Singapore.***

31. Chandra, K. S., Rao, K. V., & **Rajanna, T**. (2021). Effect of Varying In-Plane Loads and Cutout Size on Buckling Behavior of Laminated Panels. ***In Advances in Mechanical Engineering (pp. 671-678). Springer, Singapore.*** https://link.springer.com/chapter/10.1007/978-981-15-3639-7_80

32. Kalgutkar, A.P., Banerjee, S., and Rajanna, T. (2022). Effect of elliptical cutouts on buckling and vibration characteristics of stiffened composite panels under non-uniform edge loads. ***Mechanics Based Design of Structures and Machines, 1-21.*** https://doi.org/10.1080/15397734.2021.1999266

33. **Rajanna, T.**, Chandra, K.S.S., and Rao, K.V. (2022). Influence of local stiffeners and cutout shapes on the vibration and stability characteristics of quasi-isotropic laminates under hygro-thermo-mechanical loadings. ***Defence Technology.*** https://doi.org/10.1016/j.dt.2021.10.002

34. Maharudra, R., **Rajanna, T**., and Arya, B. (2022). Effect of trapezoidal shapes and non-uniform edge loads on buckling behaviour of plates with cutouts. ***Proceedings of the Institution of Mechanical Engineers, Part C: Journal of Mechanical Engineering Science. 236(7), 3512-3529.*** https://doi.org/10.1177/09544062211022258

35. Swaminathan, K., Sachin, H., & **Rajanna, T**. (2022). Vibration and stability characteristics of functionally graded sandwich plates with/without porosity subjected to localized edge loadings. ***Mechanics Based Design of Structures and Machines, 1-39.*** https://doi.org/10.1080/15397734.2022.2038619

36. Rakshith, H.S., Ravi Kumar, L., Prabhakara, D.L., and **Rajanna, T.** (2022). Vibration and Stability Characteristics of the Laminated Composite Plates (LCPs) for Various Delamination Positions. ***Advances in Structural Mechanics and Applications, 373-389.*** https://link.springer.com/chapter/10.1007/978-3-031-04793-0_29

37. Kalgutkar, A.P., Banerjee, S., and Rajanna, T. (2022). Optimum arrangement of stiffener on the buckling behaviour of stiffened composite panels with reinforced elliptical cutouts subjected to non-uniform edge load. ***Steel and Composite Structures, 42(4), 427-446.*** https://doi.org/10.12989/scs.2022.42.4.427

38. Swaminathan, K., Sachin, H., and **Rajanna, T.** (2022). Buckling Response of Functionally Graded Material Plates with Cutouts Subjected to Linearly Varying Loads. ***Recent Advances in Computational and Experimental Mechanics****, 399-408.* https://link.springer.com/chapter/10.1007/978-981-16-6490-8_33

39. Subash Chandra, K. S., Rajanna, T., and Venkata Rao, K. (2022). Effect of Nonlinearly Varying Loads and Position of Stiffener on Buckling Behaviour of Stiffened Composite Panels. ***Recent Advances in Manufacturing, Automation, Design and Energy Technologies,*** 543-551. https://link.springer.com/chapter/10.1007/978-981-16-4222-7_61

40. Darshan, B.U., Siddesha, H., and **Rajanna, T.** (2023). Structural Damage Detection for Plates Using Flexibility Based Strain Energy Method. ***Recent Advances in Civil Engineering, 285-300.*** https://link.springer.com/chapter/10.1007/978-981-19-1862-9_18

41. Swaminathan, K., Sachin, H., and **Rajanna, T.** (2022). Influence of porosity and nonuniform in-plane edge loads on vibration and buckling response of power law and sigmoid function based FG sandwich plates with geometrical discontinuities. ***Mechanics Based Design of Structures and Machines, 1-33.*** https://doi.org/10.1080/15397734.2022.2107010

42. **Swaminathan, K., Sachin, H., and** Rajanna, T. **(2023).** Effect of Porosity Distribution on Vibration and Stability Characteristics of FGM Plates Subjected to Nonlinearly Varying Edge Loads. ***Advances in Structural Mechanics and Applications, Springer***. *188-201*.
https://link.springer.com/chapter/10.1007/978-3-031-05509-6_16

43. Subash Chandra, K. S., Rajanna, T., and Venkata Rao, K. (2023). Thermal Buckling Analysis of Stiffened Composite Cutout Panels. ***Recent Trends in Construction Technology and Management,*** *935-948*
https://link.springer.com/chapter/10.1007/978-981-19-2145-2_69

INTERNATIONAL CONFERENCE PROCEEDINGS:

1. **Rajanna T**., Banerjee S., Desai Y.M., and Prabhakara D.L., (2016), "Tensile and compressive buckling analyses of stiffened laminated composite panels", ***6th International Congress on Computational Mechanics and Simulation (ICCMS), 27 June – 1 July 2016, held at Indian Institute of Technology Bombay, India.***

2. **Rajanna T**., Banerjee S., Desai Y.M., and Prabhakara D.L., (2015), "Stability behavior of composite laminates with and without cutout under non-uniform edge loads, 3rd International Conference on Buckling and Post-buckling Behaviour of Composite Laminated Shell Structures", ***25-27 March 2015, held at Technical University of Braunschweig, Germany.***

3. **Rajanna T**., Banerjee S., Desai Y.M., and Prabhakara D.L., (2014), "Buckling analysis of laminated plates subjected to partial edge loading, 5th International Congress on Computational Mechanics and Simulation (ICCMS)", ***9-12 December 2014, held at SERC-Chennai, India.***

4. **Rajanna T**., Banerjee S., Desai Y.M., and Prabhakara D.L., (2014), "Vibration and buckling analyses of laminated composite plates subjected to compressive or tensile partial edge loads, International Conference on Theoretical, Applied, Computational and Experimental Mechanics (ICTACEM)", ***29-31 December 2014, held at IITKharagpur, India.***

5. **Rajanna T**., Banerjee S., Desai Y.M., and Prabhakara D.L., (2012), "A Finite element model for the vibration analysis of laminated composite plates, ***4th International Congress on Computation Mechanics and Simulation (ICCMS)", 9-12 December 2012, held at IIT-Hyderabad, India.***

6. Subash Chandra K S, **T Rajanna** and K Venkata Rao, (2020), "Effect of temperature on vibration and buckling of compositelaminates with cutouts", ***1st Online International Conference on Recent Advances in Computational and Experimental***

MechanicsSeptember (ICRACEM), 4-6 September 2020, held at IIT Kharagpur, Paper ID: ICRACEM/2020/SM-20-026

7. K Venkata Rao, **T Rajanna** and Subash Chandra K S, (2020), "Effect of varying in-plane loads and cutout size on buckling behaviour of laminated panels", ***International conference on Advances in Mechanical Engineering(ICAME-2020), 10-11 January 2020, held at VNIT-Nagpur Maharastr.***

8. Subash Chandra K S, **T Rajanna** and K Venkata Rao, (2020), VIBRATION AND STABILITY RESPONSE OF LAMINATED COMPOSITE PANELSWITH ELLIPTICAL CUTOUT UNDER HYGROTHERMAL CONDITIONS'', ***16th INTERNATIONAL CONFERENCE ONVIBRATION ENGINEERING &TECHNOLOGY OF MACHINERY (VOTOMAC-2021), 16-18 December2021, held at BMS College of Engineering.***

9. Subash Chandra K S, **T Rajanna** and K Venkata Rao, (2020)," Effect of non-linearly varying loads and position of stiffener on buckling behaviour of stiffened composite panels", ***1st International Conference on Future Technologies in Manufacturing, Automation, Design and Energy (COFT 2020), 28-30 December 2020, held at NIT-Puducherry.***

REVIEWER OF JOURNALS:

- **WORLD SCIENTIFIC** – International Journal of Structural Stability and Dynamics
- **ELSEVIER** – Mechanics
- **EMERALD** – Journal of Structural Fire Engineering
- **Taylor & Francis** – Engineering Optimization

WORKSHOP CONDUCTED

- **Organized the two week AICTE-ISTE short term training program on "***Advanced in finite element methods and applications***", 17-28, July 2017, at** B.M.S.C.E., Bangalore.
- **Organized the one week ISTE short term training program on "***Structural Health Monitoring and its Implications* **", 15-19, June 2020, at** B.M.S.C.E., Bangalore.
- **Organized the one week ISTE & ICI short term training program on "***Recent Advances in Concrete Technology* **", 22-26, June 2020, at** B.M.S.C.E., Bangalore.
- **Organized the Two week workshop on "Skill Enhancement using ETABS SOFTWARE application in Civil Engineering", Jan-29 to Feb-13, 2020, at** B.M.S.C.E., Bangalore.
- **Organized the one week TEQIP sponsored short term training program on "***Recent Advances in Sustainable Materials for Engineering Applications* **", 22-26, Feb 2021, at** B.M.S.C.E., Bangalore.
- **Organized the one week TEQIP sponsored short term training program on "***Recent Advances in Composite Materials for Engineering Applications* **", 08-12, March 2021, at** B.M.S.C.E., Bangalore.

EXAMINATION OF M.Tech Thesis

1. M.Tech. thesis entitled "Design and Analysis of Bulkhead Frame for a Typical Aircraft", by G.C. Arpitha (2015), Department of Civil Engineering, Sahyadri Institute of Technology, Mangalore.

2. M.Tech. thesis entitled "Seismic Analysis of RC Framed Structures with and without Floating Columns", by B.L. Hariprasad (2017), Department of Civil Engineering, Govt. S.K.S.J.T.I Technological Institute, Bangalore.

3. M.Tech. thesis entitled "Strengthening of Preloaded RC Beams using CFRP Fabric with Anchorage", Rakesh (2017), B.I.T., Bangalore.

4. M.Tech. thesis entitled "Blast Resistant Buildings", by T.N. Gautham (2017), Dept. of Civil Engg., Dr. A.I.T., Bangalore.

5. M.Tech. thesis entitled "Reliability Analysis of the exterior panel of a flat slab", by C.V. Ajay Kumar (2018), Dept. of Civil Engg., M.C.E., Hassan.

6. M.Tech. thesis entitled "A Comparative Study of Regular and Irregular Shaped Precast Topped Hallow Core Diaphragm Using Beam Analogy and Finite Element Analysis", by N. Sandeep (2018), Dept. of Civil Engg., B.I.T., Bangalore.

7. M.Tech. thesis entitled "Pushover analysis of RC building with shear wall", by Rajesh Biradar (2018), Dept. of Civil Engg., B.I.T., Bangalore.

8. M.Tech. thesis entitled "Seismic analysis of vertical irregular shear wall building", by Ranjita Chavan (2018), Dept. of Civil Engg., B.I.T., Bangalore.

9. M.Tech. thesis entitled "Pushover analysis of RC building with shear wall", by Rajesh Biradar (2018), Dept. of Civil Engg., B.I.T., Bangalore.

10. M.Tech. thesis entitled "Linear static analysis of an irregular (L shaped) flat slab building for progressive collapse", by Augustin Karadigudd (2018), Dept. of Civil Engg., M.C.E., Hassan.

11. M.Tech. thesis entitled "Experimental investigation on rheological properties of recycled aggregate concrete", by Sayyed Ibrahim Uzzaman (2018), Dept. of Civil Engg., R.I.T., Bangalore.

12. M.Tech. thesis entitled "Study of vibration control on multi storey building with

isolation system", by M.P. Rahul Arya (2018), Dept. of Civil Engg., B.I.T., Bangalore.

13. M.Tech. thesis entitled "A Comparative Study of Regular and Irregular Shaped Precast Topped Hallow Core Diaphragm Using Beam Analogy and Finite Element Analysis", by N Sandeep (2018), Dept. of Civil Engg., B.I.T., Bangalore.

14. M.Tech. thesis entitled "Seismic Analysis of RCC structure with inclined additional columns at corner columns", by B.P. Radha (2018), Department of Civil Engineering, Govt. S.K.S.J.T.I Technological Institute, Bangalore.

15. M.Tech. thesis entitled "Analysis of short columns subjected to eccentric loading with varying slenderness ratios", by Asha R Malager (2018), Department of Civil Engineering, BEC, Bagalkot.

16. M.Tech. thesis entitled "Analytical study of cfrp reinforced long columns subjected to eccentric loading with varying slenderness ratio", by Vinay Hanamasagar (2018), Department of Civil Engineering, BEC, Bagalkot.

17. M.Tech. thesis entitled "Comparative Study of Mechanical and Durability Properties of Self Curing Concrete", by Vishal Kumar Awati (2018), Department of Civil Engineering, BEC, Bagalkot.

18. M.Tech. thesis entitled "Instability analysis of laminated fiber reinforced plastic (FRP) plates using ansys", by K.R. Vishnu Dev (2018), Department of Civil Engineering, R.I.T., Bangalore.

19. M.Tech. thesis entitled "Experimental & numerical study on dynamic response of building with soil-structure interaction", by Pranav S.K (2018), Department of Civil Engineering, UVCE, Jnanabharathi, Bangalore.

20. M.Tech. thesis entitled "Experimental study on properties of concrete for varying curing durations", by Abhishek K (2018), Department of Civil Engineering, UVCE, Jnanabharathi, Bangalore.

21. M.Tech. thesis entitled "Effect of curing period on concrete structures", by Mahesh Kumar R.M (2019), Department of Civil Engineering, UVCE, Jnanabharathi, Bangalore.

ORGANIZATIONAL RESPONSIBILITIES

1. **PHASE SHIFT Chief Co-ordinator,** for the academic year 2017 – 18.

2. **Chief Time-Table Coordinator from 2015 to till now**

3. **NIRMAAN Co-ordinater – an International Symposium** from the Department of Civil Engineering for the academic year 2017 – 18.

4. **WARDEN** for the national hostel (NH3) from 2017 to till date.
5. **Member in DAC Committee** from 2018 to till date
6. **Member in BOS Committee** from 2018 to till date