1.	Name : Dr. Ganesh E. Patil
2.	Designation and Present Institution (different lines separated by commas): Research Scholar (INSPIRE Fellow)
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7.	Brief account of your research interests with special focus on Nano Science and Technology (strictly within 300 words): **Summary** The Research work is concerned with the synthesis of binary oxides thin films (such as SnO_2 and ZnO) and modified by doping with Cd, Cu, Cr by simple spray pyrolysis technique and its electrical, chemical, physical and gas sensing performance were tested for their sensor properties. The thin films were prepared by changing various operating conditions, such as: precursor concentrations, quantity of spraying solution and pyrolysis temperatures. As prepared thin films were studied using: XRD for structural analysis, SEM, AFM & FESEM for surface morphology, TEM for microstructure, EDAX for elemental analysis, UV-VIS for optical properties. Successfully prepared the thin films with average crystallite size below 60 nm. The sensing performance of the all thin films was tested on exposure of gases (LPG, CO_2, H_2, NH_3, C_2H_5OH and Cl_2). These sensor properties have been particularly studied for range of gases at various operating temperatures. The film materials were modified using our unique technique i.e. doping technique. These modified films are tested for various gases and sensor is optimized. By using electronic circuitry the prototype model was developed at laboratory and this was appreciated at state level. The feature of the sensor using thin film is as: Op. Temp.: 50^oC, Target gas: H_2S, Gas concentration: 10 ppm, detection of target in terms of LED/buzzer alarm.
8.	Keywords related to your research interests (maximum 10, different lines separated by commas) Synthesis of metal oxide nanoparticles, Thin films technology, Gas sensor,

- **DST INSPIRE Fellow** (2011-12)
- **JRF, UGC (2009)**
- Stood **First** at University in M.Sc. with **Gold Medal**
- Stood **Third** at University in B.Sc.

Research Publications:

1) **Ganesh E Patil**, D D Kajale, P T Ahire, D N Chavan, N K Pawar, S D Shinde, V B Gaikwad and G. H. Jain, "Synthesis, characterization and gas sensing performance of SnO_2 thin films prepared by spray pyrolysis", *Bulletin of Material Science* Vol. 34, No. 1, February 2011, pp. 1–9.

2) **Ganesh E Patil**, D D Kajale, V B Gaikwad and G H Jain, "Nanocrystalline Tin Oxide Thin Film as a Low Level H_2S Gas Sensor" *International Journal of Nanoscience* Vol. 10, No. 4 (2011) 1-5.

3) **Ganesh E Patil**, D D Kajale, D N Chavan, N K Pawar, V B Gaikwad, G H Jain, "Spray pyrolyzed polycrystalline tin oxide thin film as hydrogen sensor", *Sensors & Transducers Journal,* Vol. 120, Issue 9, September 2010, pp. 70-79.

4) **G E Patil**, D D Kajale, S D Shinde, V B Gaikwad and G H Jain, "Synthesis and characterization of SnO_2 nanoparticles by hydrothermal route for gas sensing application" *International Nano Letters* Vol. 2, No. 1, January 2012, pp. 46-51.

5) **G. E. Patil**, D. D. Kajale, S. D. Shinde, R. H. Bari, D. N. Chavan, V. B. Gaikwad, **G. H. Jain**, "Effect of Annealing Temperature on Gas Sensing Performance of SnO_2 Thin Films Prepared by Spray Pyrolysis", *Sensors & Transducers Journal* Vol. 9, Special Issue, December 2010, pp. 96-408.

6) **Ganesh E Patil**, D D Kajale, V B Gaikwad, N K Pawar and G H Jain, "Properties and Gas Sensing Mechanism Study of CTO Thin Films as Ethanol Sensor", *Sensors & Transducers Journal*, Vol. 137, Issue 2, February 2012, pp. 47-58.

7) **G E Patil**, D D Kajale, V B Gaikwad, N K Pawar and G H Jain, "Ethanol sensing of nanostructured $CdSnO_3$ thin film by spray pyrolysis", *Journal of Nanoengineering and Nanomanufacturing* (Accepted for Publication)

8) **G. E. Patil**, D. D. Kajale, V. B. Gaikwad and G. H. Jain, "Effect of thickness on nanostructured SnO_2 thin films by spray pyrolysis as highly sensitive H_2S gas sensor", *Journal of Nanoscience and Nanotechnology* (Accepted for Publication).

9) **Ganesh E. Patil** and G. H. Jain, "Nanocrystalline $CdSnO_3$ thin film as highly sensitive ethanol sensor", Proceedings of 5th International Conference on Sensing Technology ICST-2011, 978-1-4577-0168-9, pp. 249–252, DOI. 10.1109 / ICSensT. 2011. 6136975, 2012.

10) S D Shinde, **G E Patil**, D D Kajale, V B Gaikwad and G H Jain, "Synthesis of ZnO nanorods by spray pyrolysis for H_2S gas sensor", *Journal of Alloys and Compounds,* Vol.528, 2012, pp. 109-114.

11) S D Shinde, **G E Patil**, D D Kajale, V B Gaikwad and G H Jain, "Synthesis of ZnO nanorods by hydrothermal method for gas sensor applications, *International Journal on Smart Sensing and Intelligent System* Vol. 5, No. 1, March 2012, pp. 57-70.

12) D N Chavan, **G E Patil**, D D Kajale, V B Gaikwad and G H Jain, "Studies on Gas Sensing Performance of Cr-doped Indium Oxide Thick Film Sensors", *Sensors & Transducers Journal*, Vol. 125, Issue 2, February 2011, pp. 142-155.

13) D N Chavan, D D Kajale, **Ganesh E Patil**, V B Gaikwad and G H Jain, "Studies on Gas Sensing Performance of Pure and Surface Chrominated Indium Oxide Thick Film Resistors", *Sensors & Transducers Journal*, Vol. 9, Special Issue, December 2010, pp. 82-95.

14) N K Pawar, D D Kajale, **G E Patil,** S D Shinde, V B Gaikwad and G H Jain, "Gas Sensing Characteristics of Pure and ZnO-Modified Fe_2O_3 Thick Films", *New Developments and Applications in Sensing Technology*, *Lecture Notes in Electrical Engineering*, 2011, Volume 83, pp. 123-135.

15) G H Jain, **Ganesh E Patil**, D D Kajale and V B Gaikwad, "Cr_2O_3-doped $BaTiO_3$ as an Ammonia Gas Sensor", *New Developments and Applications in Sensing Technology*, *Lecture Notes in Electrical Engineering*, 2011, Volume 83, pp. 157-167.

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17) D. N. Chavan, V. B. Gaikwad, **Ganesh E. Patil**, D. D. Kajale, G. H. Jain, "CdO Doped Indium Oxide Thick Film as a Low Temperature H_2S Gas Sensor", *Sensors & Transducers Journal*, Vol. 129, Issue 6, June 2011, pp. 122-134.

18) D. N. Chavan, V. B. Gaikwad, D. D. Kajale, **Ganesh E. Patil**, G. H. Jain, "Nano Ag-doped In_2O_3 thick film: A low temperature H_2S gas sensor", *Journal of Sensors,* Volume 2011, Article ID 824215, 8 pages doi:10.1155/2011/824215.

19) D D Kajale, V B Gaikwad, S D Shinde, D. N. Chavan, **G E Patil**, V. P. Patil and G H Jain, "Effect of Surface Modification on $SrTiO_3$ Thick films: Room Temperature H_2S Gas Sensor", *Sensors & Transducers Journal,* Vol. 137, Issue 2, February 2012, pp. 10-21.

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21) S D Shinde, **G E Patil**, D D Kajale, V B Gaikwad and G H Jain, "Gas sensing performance of nanostructured ZnO thick film resistors", *International Journal of Nanoparticles,* Vol. 5, No. 2, 2012, pp. 126-135.

22) K.K. Thakur, D. V. Ahire, V. B. Gaikwad, **G. E. Patil**, D. D. Kajale, G. H. Jain, "Preparation of nano-In_2O_3 thin films by spray pyrolysis for gas sensing application", *International Journal of Nanoparticles* (Article in Press)

23) S. B. Deshmukh, **G. E. Patil**, R. H. Bari, L. A. Patil, and G. H. Jain, "Studies on gas sensing performance of pure and surface modified ZrO_2 thick film resistor", Proceedings of 5^{th} International Conference on Sensing Technology ICST-2011, 978-1-4577-0168-9, pp. 278 - 285. DOI. 10.1109/ICSensT.2011.6136981, 2012.

24) D D Kajale, **G E Patil**, , V B Gaikwad, S D Shinde, D. N. Chavan, N K Pawar, S R Shirsath and G H Jain, "Synthesis of $SrTiO_3$ nanopowder by Sol-Gel Hydrothermal method for gas sensing application", *International Journal on Smart Sensing and Intelligent System* Vol. 5, No. 2, June 2012, pp. 382-400.

25) N K Pawar, D D Kajale, **G E Patil**, V G Wagh, V B Gaikwad, M K Deore and G H Jain, "Nanostructured Fe_2O_3 thick film as an ethanol sensor", *International Journal on Smart Sensing and Intelligent System* Vol. 5, No. 2, June 2012, pp. 441-457.

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