



## Shrawan Kumar Patel



Assistant Professor (Level-12)

### School of Studies of Engineering & Technology

Department of Electronics and Communication Engineering

Room No: F-12, ECE Building (No. 21), GGV Campus, Koni, Bilaspur CG

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**Webpage:** <https://ggu.ac.in/departement/ece/faculty/shrawan-kumar-patel/>

### Educational Qualification:

- **Ph. D.** (Microwave Circuits) – (2022 – 2025) – *Thesis Submitted*  
(CGPA – 9.5/10)  
**Thesis Title:** Design and Analysis of PCB-based, Low Profile, Compact and Wideband Passive RF Components for Analog Beamforming Applications  
**Thesis Supervisor:** Prof. Mrinal Kanti Mandal, Department of E & ECE  
**Institute:** Indian Institute of Technology, Kharagpur WB
- **M.E.** (Electronics and Tele-Communication Engineering) – (2007 – 2009)  
(Percent – 84.45%)  
**Specialization:** Electronics & Telecommunication Engineering  
**University:** Rajiv Gandhi Proudyogiki Vishwavidyalaya, Bhopal MP  
**Institute:** SGSITS, Indore M.P. (June, 2009)
- **B.E.** (Electronics and Tele-Communication Engineering) – (2003 – 2007)  
(CGPA – 8.26/10)  
**Specialization:** Electronics & Telecommunication Engineering  
**University:** Guru Ghasidas University, Bilaspur CG  
**Institute:** GEC, Bilaspur C.G. (June, 2007)
- **12<sup>th</sup> Standard** (HSSC) - 2003  
(Percent – 83 %)  
**Subjects:** Physics, Chemistry, Mathematics, Hindi, English  
**Board:** CGBSE, Raipur C.G. (May, 2003)  
**School:** Saraswati Shishu Mandir Higher Secondary School, Laxmipur Raigarh CG
- **10<sup>th</sup> Standard** (HSC) - 2001  
(Percent – 80 %)  
**Subjects:** Hindi, English, Mathematics, Science, So. Science, Sanskrit  
**Board:** MPBSE, Bhopal M.P. (May, 2001)  
**School:** Saraswati Shishu Mandir Higher Secondary School, Laxmipur Raigarh CG

### Teaching Experience:

- **Designation:**
  - Assistant Professor - Level 12 (12<sup>th</sup> Sep, 2020 to till date)
  - Assistant Professor - Level 11 (12<sup>th</sup> Sep, 2016 to 12<sup>th</sup> Sep, 2020)
  - Assistant Professor - Level 10 (12<sup>th</sup> Sep, 2011 to 12<sup>th</sup> Sep, 2016)**Department:** Electronics & Communication Engineering  
**Organization:** School of Studies of Engineering and Technology  
Guru Ghasidas Vishwavidyalaya, Bilaspur (CG), INDIA
- **Designation:** Senior Lecturer (Since July, 2009 to Mar, 2010)  
**Department:** Electronics & Telecommunication Engineering  
**Organization:** Lakhmi Chand Institute of Technology, Bilaspur (CG), INDIA

## Industrial and Other Experience:

- **Designation:** Treasurer (Since Nov., 2024 to Oct., 2025)  
**Department:** AP-MTTS SBC, IIT Kharagpur  
**Organization:** Indian Institute of Technology, Kharagpur (WB), INDIA
- **Designation:** Assistant Secretary (Since Nov., 2022 to Oct, 2023)  
**Department:** AP-MTTS SBC, IIT Kharagpur  
**Organization:** Indian Institute of Technology, Kharagpur (WB), INDIA
- **Designation:** Junior Telecom Officer (Since Apr, 2010 to Aug, 2011)  
**Department:** OFC Maintenance (ETR) Division, Rourkela, ODISHA  
**Organization:** Bharat Sanchar Nigam Limited, INDIA

## Areas of Interest/Specialization:

- **RF Beamformers** (Butler Matrix, Nolen Matrix, Rotman Lens etc.)
- **Microwave Active and Passive Circuits**
  - Couplers
  - Power Dividers
  - Crossovers
  - RF Switches
  - RF Phase-shifters
  - Microwave Amplifiers
- **Microwave Antennas**

## Awards and Honors:

- Awarded with **IEEE AP-S Student Travel Grant** to attend 2025 IEEE International Symposium on Antennas & Propagation and North American Radio Science Meeting (IEEE AP-S/URSI-2025) during 13-18 Jul., 2025 at Ottawa, Canada.
- Awarded with **Overall Conference Best Paper Award** in IEEE India Council International Conference (INDICON-2024) during 18-20 Dec., 2024 at IIT Kharagpur, India.
- Awarded with **Best Paper Award in Microwave and Antenna Track** in IEEE India Council International Conference (INDICON-2024) during 18-20 Dec., 2024 at IIT Kharagpur, India.
- Awarded with **Best Student Paper Award** in Asia Pacific Microwave Conference (APMC-2024) during 17-20 Nov., 2024 at Bali, Indonesia.
- Awarded with **IEEE MTT-S Student Travel Grant** to attend Asia Pacific Microwave Conference (APMC-2024) during 17-20 Nov, 2024 at Bali, Indonesia.
- Awarded with **NPTEL Believers Award** from NPTEL during Jan-Dec, 2020.
- UGC-NET Qualified in Electronic Sciences in June-2019
- GATE Qualified (GATE 2007, 2010 and 2011 in Electronics Engineering)
- Received MHRD Scholarship in Master in Engineering
- Received Merit Scholarship during Bachelor of Engineering

## Professional Membership:

- Institute of Electrical and Electronics Engineers (IEEE)-Graduate Student Member
- Institution of Engineering and Technology (IET)-Student Member
- Indian Society for Technical Education (ISTE)-Life Member
- Institution of Electronics and Telecommunication Engineers (IETE)-Member
- Institution of Engineers (IEI)-Member
- Wireless Antenna and Microwave Symposium Society (WAMSS)-Life Senior Member
- International Association of Engineers (IAENG)-Member

## Publications:

### Journals:

1. **Patel S. K.** and Mandal M. K., "A miniaturized ultra-wideband directional coupler", IEEE Microw. Wireless Compon. Lett., (*Early Access*).
2. **Patel S. K.**, Kumar R., Soni A. K., Tamrakar C. and Roy C. "Theoretical optimization and design of graphene-based multiple-band terahertz absorbers for sensing applications", Microsystem Technologies, vol. 30, issue 02, pp. 1-13, Feb 2025.
3. **Patel S. K.**, Soni A. K. and Tamrakar C. "Performance Analysis of RIPV2, EIGRP and OSPF Protocols in Metropolitan Area Network using Cisco Packet Tracer", Chhattisgarh Journal of Science and Technology, vol. 19, issue 01, pp. 234-236, Jan 2022.
4. **Patel S. K.**, Soni A. K. and Tamrakar C. "Scenario-based Performance Analysis of Dynamic Routing Protocol using Cisco Packet Tracer", Chhattisgarh Journal of Science and Technology, vol. 18, issue 02, pp. 216-219, Apr 2021.
5. **Patel S. K.**, Soni A. K. and Tamrakar C. "Performance Analysis of SAR Reduction in PIFA using Electromagnetic Band Gap (EBG) Structures", Chhattisgarh Journal of Science and Technology, vol. 18, issue 01, pp. 201-204, Jan 2021.
6. **Patel S. K.**, "Parameter Improvement of MPA using Square Shape Reflector for S-Band Wireless Application", International Journal of Technical Innovation in Modern Engineering & Science, vol. 05, issue 05, pp. 1045-1047, May 2019.
7. **Patel S. K.**, "Performance Enhancement of Microstrip Patch Antenna Using EBG Structures for Wireless Applications", International Journal of Technical Innovation in Modern Engineering & Science, vol. 04, issue 05, pp. 1267-1271, May 2018.
8. **Patel S. K.**, "An E-Shaped Microstrip Patch Antenna for IEEE 802.11a High Speed Wireless LAN Application", International Journal of Advanced Research in Electronics and Communication Engineering, vol. 06, issue 12, pp. 1320-1322, Dec 2017.
9. **Patel S. K.**, and Shukla G. P. "Bandwidth Enhancement of an E-Shaped Antenna for WLAN Application", International Journal of Electrical Electronics & Computer Science Engineering, vol. 04, issue 06, pp. 88-90, Dec 2017.
10. **Patel S. K.**, "Enhancement of Directional Parameter of a Microstrip Patch Antenna resonating at 2.4 GHz", International Journal of Current Engineering and Scientific Research, vol. 02, issue 04, pp. 111-114, April 2015.
11. **Patel S. K.**, "Improvement in Efficiency Parameter of a Microstrip Patch Antenna operating at 2.4 GHz for WLAN", IOSR Journal of Electronics and Communication Engineering, vol. 01, pp. 01-06, April 2015.
12. **Patel S. K.**, and Dewangan R. K. "Design of RF CMOS Gilbert Cell Mixer at 30MHz using 0.12 $\mu$ m Technology", International Journal of Advances in Electronics Engineering, vol. 02, issue 02, pp. 120-124, March 2012.

### Conferences (Scopus Indexed):

1. **Patel S. K.** and Mandal M. K., "A compact modified Schiffman phase shifter for wideband differential phase difference response," in 4th IEEE Microwave and Antenna Propagation Conference (MAPCON), Kochi, India, 2025. (under review)
2. **Patel S. K.** and Mandal M. K., "A wideband 3 $\times$ 3 Nolen matrix using directional couplers and crossovers for WLAN applications," in 4th IEEE Microwave and Antenna Propagation Conference (MAPCON), Kochi, India, 2025. (under review)
3. **Patel S. K.** and Mandal M. K., "Compact, two-layer crossover in PCB technology with 200% effective bandwidth," in 4th IEEE Microwave and Antenna Propagation Conference (MAPCON), Kochi, India, 2025. (under review)
4. **Patel S. K.**, Nagar C. K. and Mandal M. K., "A compact ultra-wideband 2-18 GHz bias-tee with improved isolation," in 4th IEEE Microwave and Antenna Propagation Conference (MAPCON), Kochi, India, 2025. (under review)

5. Patel M., **Patel S. K.**, Sen D. and Mandal M. K., "Design of a compact sub-6 GHz power amplifier with radial stub-based bias network for harmonic control," in 4th IEEE Microwave and Antenna Propagation Conference (MAPCON), Kochi, India, 2025. (under review)
6. **Patel S. K.**, Nagar C. K. and Mandal M. K., "A modified low-loss and compact bias tee with improved isolation and reduced loading effect," in IEEE Int. Sym. Antennas Propag./North American Union Radio Sci. Meeting (AP-S/URSI), Ottawa, Canada, 2025, pp. 1-2.
7. **Patel S. K.** and Mandal M. K. "Miniaturization of Wideband  $4 \times 4$  Butler Matrix With a Modified Two-Stage Schiffman Phase Shifter," in 21st IEEE India Council International Conference (INDICON-2024), Kharagpur, INDIA, Dec. 2024, pp. 1-4.
8. Yadav A., **Patel S. K.** and Mandal M. K. "A PCB-Based Wideband H-Probe for Near-field Scanning," in 21st IEEE India Council International Conference (INDICON-2024), Kharagpur, INDIA, Dec. 2024, pp. 1-4.
9. Sen M., **Patel S. K.** and Mandal M. K. "A Miniaturized Unequal Wilkinson Power Divider for Wireless LAN Applications," in 21st IEEE India Council International Conference (INDICON-2024), Kharagpur, INDIA, Dec. 2024, pp. 1-4.
10. Sujay S., **Patel S. K.** and Mandal M. K. "Measurement of Transient Responses in RF Circuits Using a Spectrum Analyzer," in 21st IEEE India Council International Conference (INDICON-2024), Kharagpur, INDIA, Dec. 2024, pp. 1-4.
11. **Patel S. K.**, Mandal M. K., and Patel M. "A Compact Five-Port Hybrid Network with Electronic Control of Both Magnitude and Phase," in 3rd IEEE Microwave and Antenna Propagation Conference (MAPCON-2024), Hyderabad, INDIA, Dec. 2024, pp. 1-4.
12. Patel M., **Patel S. K.**, Mandal M. K. and Sen D. "An X-Band RF Binary Phase Modulator Based on a Reflection-Type Phase Shifter," in 3rd IEEE Microwave and Antenna Propagation Conference (MAPCON-2024), Hyderabad, INDIA, Dec. 2024, pp. 1-4.
13. **Patel S. K.** and Mandal M. K. "A Compact  $4 \times 4$  Butler Matrix with Improved Crossover for Wireless LAN Applications," in IEEE Asia Pacific Microwave Conference (APMC-2024), Bali, Indonesia, Nov. 2024, pp. 1-4.
14. **Patel S. K.**, and Mandal M. K. "An Improved Marker Beacon Receiver System," in IEEE 8th International Conference on Computers and Devices for Communication (CODEC-2023), Kolkata, INDIA, Dec 2023, pp 1-4.

#### Patents:

1. **Patel S. K.**, and Mandal M. K., "Microstrip line based compact wideband phase shifter," Indian Patent Appl. No. 202531018793, filed on Mar. 03, 2025.
2. **Patel S. K.**, Nagar C. K., and Mandal M. K., "Microstrip line based compact wideband RF bias tee in PCB technology," Indian Patent Appl. No. 202531018230, filed on Mar. 01, 2025.
3. **Patel S. K.**, and Mandal M. K., "Microstrip line based compact ultra-wideband RF directional coupler system in PCB technology," Indian Patent Appl. No. 202531013975, filed on Feb. 18, 2025.
4. **Patel S. K.**, and Mandal M. K., "Microstrip line based compact ultra-wideband RF crossover in PCB technology," Indian Patent Appl. No. 202531006706, filed on Jan. 28, 2025.
5. **Patel S. K.** et al., "AI-enhanced multimeter for microwave circuit diagnostics," Indian Patent Appl. No. 202441081222, published on Nov. 01, 2024.
6. **Patel S. K.** et al., "MIMO antenna system optimized for 5g networks," Indian Patent Appl. No. 202441071577, published on Oct. 04, 2024.

#### Book chapters:

1. Soni A.K., **Patel S.K.**, Varshney G. (Jun. 2024), "Metal-free terahertz absorber/sensor using patterned graphite", in Challenges and Opportunities in Industrial and Mechanical Engineering: A Progressive Research Outlook: Proceedings of the International Conference on Progressive Research in Industrial & Mechanical Engineering (PRIME 2021), August 05-07, 2021, Patna, India, 1st ed. chapter 46, page 16, CRC Press, London. <https://doi.org/10.1201/9781032713229>.

2. Soni A.K., Kumar R., **Patel S.K.**, Soni A. (Nov. 2021), "Non-destructive Fusion Method for Image Enhancement of Eddy Current Sub-surface Defect Images", in Machine Vision and Augmented Intelligence—Theory and Applications: Lecture Notes in Electrical Engineering, vol 796. Springer, Singapore. [https://doi.org/10.1007/978-981-16-5078-9\\_50](https://doi.org/10.1007/978-981-16-5078-9_50)

## Administrative Responsibilities:

### Department Level:

- **Faculty Coordinator, B. Tech First Year:** From September 2025 to till now.
- **Member, Board of Studies:** From April 2019 to April 2022.
- **Departmental Project In charge:** July 2021 to June 2022.
- **Examination In charge:** July 2012 to June 2014 & July 2019 to June 2021.
- **Alumni Cell In charge:** From July 2016 to June 2019.
- **Training & Placement Cell In charge:** From July 2016 to June 2019.
- **NIRF/NAAC/ AQAR In charge:** From July 2016 to June 2019.
- **Student Mentor:** July 2012-June 2013, July 2015-June 2016, July 2019 to June 2022.

### Institute Level:

- **Coordinator,** Student Tech-Fest (Equilibrio 2K22) Session 2021-22.
- **Assistant Exam Superintendent,** Semester Exam Session 2019-20 at SoS(E&T).
- **Coordinator,** Document Verification Committee for B. Tech Admission (2019-20).
- **Co-coordinator,** JoSSA/CSAB/ Local Counseling for B. Tech Admission (2018-19).
- **Co-coordinator,** Student Tech-Fest (Equilibrio 2K19) Session 2018-19.

### University Level:

- **Module Coordinator,** SAMARTH Portal, GGV Bilaspur CG (from Jan. 2020 to Jan. 2022).
- **Member,** NAAC/IQAC Team, GGV Bilaspur CG (from Jan. 2020 to Jan. 2022).
- **Member,** CCTV Installation & Monitoring Committee, GGV Bilaspur CG.
- **Warden,** Type-IV Boys Hostel, GGV Bilaspur CG (from Aug. 2012 to Oct. 2016).

## Additional Information:

### Lecture Delivered:

- Online Expert Lecture delivered on "**Hands-on session on Microwave Passive components design using Keysight ADS**" in a workshop conducted by IEEE MTT-S SBC Vardhman College of Engineering, Hyderabad, on 07.06.2025.
- Online Expert Lecture delivered on "**Beamforming Networks: An Innovative Approach**" at CIST Bhopal MP, on 30.01.2022.

### Industrial Training Attended:

- Two weeks online Industrial Training on "Integrated Telecom/Data Network & Cyber Security" organized by **Advanced Level Telecom Training Centre Ghaziabad** (An APEX Training Institute of BSNL) from 23.05.2022 to 04.06.2022.
- Two weeks online Industrial Training on "Internet of Things- A Project Based Learning using Virtual IoT Lab" organized jointly by **NITTTR Chandigarh and Xtrans Solutions Pvt. Ltd., Bangalore** from 08.07.2020 to 19.07.2020.

### Programme organized:

- One week online FDP on "**Outcome Based Curriculum Design**" organized from 05.09.2022 to 09.09.2022 as a member of the Organizing Team.
- One week ATAL FDP on "**Devices for Modern Wireless Communication System**" organized from 20.09.2021 to 24.09.2021 as a member of the Organizing Team
- One-week online seminar on "**Current Trends in Engineering Projects**" organized from 25.11.2020 to 29.11.2020 as Coordinator.

### **FDP/Workshop Attended:**

1. An online one week ATAL FDP on "Devices for Modern Wireless Communication System" conducted by **SoS(E&T), GGV Bilaspur CG** from 20.09.2021 to 24.09.2021.
2. An online one week ATAL FDP on "Modern Antenna Technologies for Futuristic Wireless Communication Systems" conducted by **GJUS&T Hisar, Haryana** from 20.08.2021 to 24.08.2021.
3. An online one week ATAL FDP on "Antenna: Design, Fabrication and Measurement" conducted by **GBPIET, Garhwal UK** from 02.08.2021 to 06.08.2021.
4. An online one week FDP on "Recent Advances in Antennas & Wireless Communications" conducted by **BEC, Bapatla AP** from 27.07.2021 to 31.07.2021.
5. An online one week AICTE sponsored UHV Refresher 1 FDP conducted by **AICTE New Delhi** from 22.02.2021 to 26.02.2021.
6. An online one week FDP on "Free and Open Source Software (FOSS) Tools for Effective Teaching Learning" conducted by **NITTTR Chandigarh** from 15.02.2021 to 19.02.2021.
7. An online one week AICTE sponsored FDP on "Inculcating Universal Human Values in Technical Education" conducted by **AICTE New Delhi** from 08.02.2021 to 12.02.2021.
8. An online one week ATAL FDP on "Wearable Devices" conducted by **SVERICE Solapur MH** from 01.02.2021 to 05.02.2021.
9. An online one week ATAL FDP on "System Engineering" conducted by **COEP Pune MH** from 04.01.2021 to 08.01.2021.
10. NPTEL AICTE FDP on "Microwave Theory & Techniques" through **SWAYAM Portal IIT Bombay** from Sep – Dec 2020.
11. NPTEL AICTE FDP on "Control Engineering" through **SWAYAM Portal IIT Madras** from Jan – Apr 2020.
12. NPTEL AICTE FDP on "Antennas" through **SWAYAM Portal IIT Bombay** from Jan – Apr 2020.
13. An online one week STTP on "Design and Simulation of Miniature Antenna for IoT Applications (DMAIA - 2020)" conducted by **MVGRCE Vizianagaram** from 23.11.2020 to 28.11.2020.
14. An online one week ATAL FDP on "Wearable Devices" conducted by **TIET Patiala** from 16.11.2020 to 20.11.2020.
15. An online one week STTP on "ICT Tools for Engineering College Technology and Outcome Based Learning" conducted by **RIT Vishakhapatanam** from 09.11.2020 to 14.11.2020.
16. An online one week STTP on "ICT Tools for Engineering College Technology and Outcome Based Learning" conducted by **RIT Vishakhapatanam** from 26.10.2020 to 31.10.2020.
17. An online one week ATAL FDP on "Flexible and Wearable Antennas: Recent Advancements, Fabrication Techniques and Applications." conducted by **NITTTR Chandigarh** from 12.10.2020 to 16.10.2020.
18. An online one week STTP on "ICT Tools for Engineering College Technology and Outcome Based Learning" conducted by **RIT Vishakhapatanam** from 05.10.2020 to 10.10.2020.
19. An online one week STTP on "Electromagnetics, Microwave, RF & Antenna Design Using Ansys HFSS" conducted by **SVECW Bhimavaram AP** from 21.09.2020 to 26.09.2020.
20. An online one week STTP on "Antenna Design and Analysis Using Mathematical Solvers" conducted by **AITM Tekkali AP** from 07.09.2020 to 12.09.2020.
21. An Online one week STTP on "Electromagnetics, Microwave, RF & Antenna Design Using Ansys HFSS" conducted by **SVECW Bhimavaram AP** from 24.08.2020 to 29.08.2020.
22. An Online one week STTP on "Design of Miniature Antenna for 5G and IoT Applications (DMAIA-2020)" conducted by **MVGRCE Vizianagaram** from 10.08.2020 to 15.08.2020.
23. An Online one week hands on Workshop on "Wire Antennas: Design, Analysis and Optimization using 4NEC2X" conducted by **SSGMCE, Shegaon, MH** from 03.08.2020 to 07.08.2020.
24. An Online One week International Workshop on "Metamaterial & its Applications" conducted by **GWEC Ajmer, Rajasthan** from 27.07.2020 to 31.07.2020.



25. An Online One week Faculty Development Program on "Modeling, Measurement and Research trends in Microstrip Patch Antenna" **VIMTW Telangana** from 20.07.2020 to 25.07.2020.
26. A Refresher course on "Recent Advances in Emerging Areas of Engineering, Technical Education & Research" at Human Resource Development Centre, **Guru Ghasidas Vishwavidyalaya, Bilaspur CG** in June 2019. (from 24.06.2018 to 06.07.2019)
27. A Refresher course on "Research Methodology" at Human Resource Development Centre, **Guru Ghasidas Vishwavidyalaya, Bilaspur CG** in June 2018. (from 16.06.2018 to 06.07.2018)
28. A Refresher course on "Advances in Engineering & Technology" at Human Resource Development Centre, **Guru Ghasidas Vishwavidyalaya, Bilaspur CG** in June 2017. (from 05.06.2017 to 24.06.2017)
29. An Orientation Program at Human Resource Development Centre, **Guru Ghasidas Vishwavidyalaya, Bilaspur, CG** in May 2017. (from 01.05.2017 to 29.05.2017)
30. AICTE sponsored STC on "Design of Microwave Antennas & Passive Components", at **Indian Institute of Technology (BHU), Varanasi** in Dec 2016. (from 19.12.2016 to 24.12.2016)
31. A CEP "Summer Faculty Research Fellowship" Programme at **Indian Institute of Technology, Delhi** in May 2016. (from 23.05.2016 to 08.07.2016)
32. An STC on "Design and Simulation of Antennas & Microwave Devices", at **National Institute of Technology, Rourkela** in June 2015 (from 03.06.2015 to 10.06.2015).
33. AICTE sponsored STC on "Fundamentals and Applications of Metamaterials", at **Indian Institute of Technology, Kanpur** in April 2015 (from 06.04.2015 to 10.04.2015).
34. A DeITY, MCIT sponsored STTP on "Wireless Sensor Networks: Secure Data Aggregation and Related Issues (WSN-SDARI)" at **SV National Institute of Technology, Surat** in July 2014 (from 14.07.2014 to 18.07.2014).
35. A Summer School on "Wireless Networks: Research Issues and Applications" at **National Institute of Technology, Rourkela** in May 2014 (from 19.05.2014 to 23.05.2014).

#### **SWAYAM/NPTEL Courses Completed:**

- Antenna (Elite + Silver)
- Control Engineering (Elite + Silver)
- Signals & Systems (Elite + Silver)
- Microwave Theory and Techniques (Elite + Silver)

#### **Courses Taught:**

- Microwave Engineering
- Antenna & Wave Propagation
- Electromagnetic Field Theory
- Automatic Control Systems
- Signals and Systems
- Electronic Devices & Circuits

(SHRAWAN KUMAR PATEL)