

**S M FIJUL KABIR (MAHIN)**

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**S M Fijul Kabir**

Wilson College of Textiles

NC State University

Raleigh, NC 27606, USA

**SUMMARY**

- Graduate Teaching and Research Assistant, as well as an Instructor at the Wilson College of Textiles, NC State University, Raleigh, NC, USA
- Eight years+ of teaching, research, industrial and leadership experience
- Expertise in fibers, polymers, textiles, composites and 3D printing
- Designed, taught and assisted a variety of courses at undergraduate and graduate levels in the realm of textile engineering, chemistry, science and technology as well as fashion merchandising
- Supported in innovation and grant writing, published scholastic scientific articles in recognized journals, presented works in international conferences and seminars
- Managed labs (Textile Science Lab and 3D printing Lab), developed standard operating procedures for equipment, conduct equipment trainings and routine calibrations, and mentor incoming undergraduate and graduate students
- Serving as editorial board member and reviewer for different journals from Springer, Elsevier, ACS, Wiley, Sage, MDPI
- Demonstrated research background in textile and fiber science with a strong focus on sustainable manufacturing and processing initiatives

**EDUCATION****NC State University, Raleigh, NC, USA**

PhD in Fiber and Polymer Science; CGPA 3.952/4.00

March 2021

Dissertation: Mechanics of 3D printed fiber-reinforced composites

Co-advisor: Dr. Abdel-Fattah M. Seyam &amp; Dr. Kavita Mathur

**Louisiana State University, Baton Rouge, LA, USA**

MS in Textile Science and Minor in Applied Statistics; CGPA 4.00/4.00

May 2018

Thesis: Waste management by waste: removal of acid dyes from wastewaters of textile coloration using fish scales

Advisor: Dr. Ioan I. Negulescu

**University of Chittagong, Chittagong, Bangladesh**

BS in Textile Engineering with major in Apparel Engineering; CGPA 3.65/4.00

June 2013

Project: Production optimization through line balancing and layout of sewing machine for a basic T-shirt

Supervisor: Md. Nurul Islam Nahid

**Ideal College, Dhaka, Bangladesh**

August 2007

Higher Secondary Certificate (Science); GPA 4.90/5.00

**Bharipasha Secondary School, Patuakhali, Bangladesh**

July 2005

Secondary School Certificate (Science); GPA 4.69/5.00

**ACADEMIC EXPERIENCE****Instructor and Teaching Assistant**

Since 2018

NC State University (NC SU), Raleigh, NC, USA

**Visiting Lecturer**

July 2018

Dhaka University of Engineering Technology (DUET), Gazipur, Bangladesh

**Graduate Teaching Assistant**

August 2016- May 2018

Louisiana State University (LSU), Baton Rouge, USA

**Lecturer**

April 2014-July 2016

BGMEA University of Fashion &amp; Technology (BUFT), Dhaka, Bangladesh

**Lecturer**

November 2013-April 2014

Shanto-Mariam University of Creative Technology (SMUCT), Dhaka, Bangladesh

**Visiting Lecturer**

January 2016-June 2016

Textile Engineering College (CTEC), Chittagong, Bangladesh

## Courses Designed and Taught at Undergraduate Level

A number of courses designed, including lecturers, labs, followed by performance assessment by creating, taking and grading quiz, assignments, exams and presentations

### *At NCSU*

- Formation and Structure of Textile Fabrics (lab) Since Spring 2019
- Formation and Structure of Textile Fabrics (teaching substitute) Since Fall 2019

### *At BUFT*

- Dyeing, Printing and Finishing (including lab) Spring 2015-Spring 2016
- Testing of Textiles (including lab) Spring 2015
- Fiber, Yarn and Fabric Spring 2015
- Apparel Production Accessories (including lab) Fall 2014-Fall 2015
- Apparel Production Engineering (including lab) Fall 2015-Spring 2016
- Apparel Production System analysis Fall 2014
- Special Apparel Production and Merchandising Spring 2016

### *At SMUCT*

- Textile Science Fall 2013-Spring 2014
- Introduction to Fashion and Apparel Industries Fall 2013-Spring 2014

### *At CTEC*

- Advanced Apparel Production and Merchandising (including lab) Spring 2016

## Invited Lecture at Graduate Level (MSc in Textile Engineering)

### *At DUET on*

- Research Methodology July 2018
- Statistics of Textile Engineering July 2018

## Undergraduate Project Supervised

- Effect of dyeing on comfortability of cotton knit fabric in terms of moisture behavior  
Textile Engineering College, Chittagong, Bangladesh Spring 2016

## Lab Management

- Manager, 3D Printing Lab, Wilson College of Textiles, NCSU Since January 2019
- Managed Textile Science Lab, Department of Textiles Apparel Design and Merchandising, LSU January 2017-May 2018

## Mentorship and Training Offered

- Trained and co-mentored graduate and undergraduate students working in 3D printing lab at NC State August 2020-present
  - Muneeb Tahir (Fiber and Polymer Science PhD Student at NCSU)
  - Margaret Mars Harvey (MS in Textiles Student at NCSU)
  - Ava Armstrong (BS in Fashion and Textile Management Student at NCSU)

## Distance Education

- Evaluate the effectiveness an online course (Formation and Structure of Textile Fabrics)
- Provided feedback with recommendations to improve content and presentation

## Academic Certifications

- Teaching and Communication Certificate (comprised of at least 100 hours of designated workshops with a portfolio design), Spring 2021, NC State University, USA
- Accessibility in the Classroom, October 12 - November 11, 2020 with NC State university, USA
- Designing Effective Online Courses, August 17-September 2, 2020 with The University of North Carolina System, USA
- Spoken English for International Graduate Assistants, received recommendation for conducting class, LSU, USA

## RESEARCH EXPERIENCES

**Research Interests**

Additive manufacturing/3D printing  
 Fiber-reinforced composites  
 Biopolymers  
 Sustainable textile processing  
 Clothing comfort and protective clothing

**ORCID**

<https://orcid.org/0000-0002-9354-2022>

**Total Google Scholar Citations**

240+

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**Research Positions**

- Research Assistant August 2018-present  
 3D Printing Lab, Wilson College of Textiles, NC State
  - Research design
  - Composite fabrication
  - Mechanical testing of the developed composites
  - Data analysis, presentation, interpretation and writing manuscript
- Research Assistant December 2013-August 2018  
 Md Abdul Hannan's Lab, Dhaka University of Engineering Technology, Gazipur, Bangladesh
  - Performed laboratory experiments
  - Data analysis and presentation
  - Conducting literature review

**Research Projects**

- **Fiber-reinforced 3D printed composites** Since August 2018
  - Development of pathways to improved fiber-reinforced 3D printing technology
  - Development of lightweight composite structure using 3D printing technology
  - Enhancing the mechanical performance of 3D printed composites
  - Feasibility assessment of 3D printing compared to traditional technology
- **Sustainable Textile Processing** Since December 2013
  - Development of sustainable textile wet processing (pretreatment and dyeing) using no chemical/minimum chemicals/naturally derived materials
  - Textile wastewater treatment using dye-surfactant interaction, bio-sorbents (biopolymers, fish scales, banana peel)
- **Technology Development in Textile and Fashion Industry** January-October 2020
  - Reshoring analysis of textile industry in the USA
  - Fashion forecasting using machine learning

**Invention disclosure**

Supported in the invention titled "Method of Textile Scouring and Bleaching of Cotton Knit Fabric without Pretreatment Chemicals at Elevated Temperature" applied to file patent in 2018 to the Department of Patents, Designs & Trademarks, Ministry of Industries, Dhaka, Bangladesh (not listed as a co-inventor due to university protocols)

**Grant Writing**

Prepared proposal and applied for federal grants, NCSU, USA

**Published Articles**

1. Akter, Maimuna, Maitry Bhattacharjee, Avik Kumar Dhar, Fahim Bin Abdur Rahman, Siddika Haque, Taslim Ur Rashid, and **Kabir, SMF** (2021). Cellulose-based hydrogels for wastewater treatment: a concise review. *Gels*, 7 (1).
2. Mathur, K., **Kabir, SMF.**, and Seyam, A.M. (2020). Tensile properties of 3D printed continuous fiberglass reinforced cellular composites. *The Journal of The Textile Institute*. 1-10.
3. Chakraborty, S., Hoque, S. M., **Kabir, SMF** (2020). Predicting fashion trend using runway images: application of logistic regression in trend forecasting. *International Journal of Fashion design, Technology and Education*, 1-11.
4. **Kabir, SMF.**, Mathur, K., & Seyam, A.M. (2020). The road to improved fiber-reinforced 3D printing technology. *Technologies*, 8 (51).
5. **Kabir, SMF.**, Mathur, K., & Seyam, A.M. (2020). Impact resistance and failure mechanism of 3D printed continuous fiber-reinforced cellular composites. *The Journal of The Textile Institute*, 1-15.
6. Rashid, T. U., **Kabir, SMF.**, Biswas, MC, Bhuiyan, MAR. (2020). Sustainable wastewater treatment via dye-surfactant interaction: a critical review. *Industrial & Engineering Chemistry Research*, 21 (2020), 9719-9745.

7. **Kabir, SMF.**, Mathur, K., & Seyam, A.M. (2019). A critical review on 3D printed continuous fiber-reinforced composites: history, mechanism, materials and properties. *Composite Structures*, 111476.
8. **Kabir, SMF.**, Cueto, R., Balamurugan, S., Romeo, L. D., Kuttruff, J. T., Marx, B. D., & Negulescu, I. I. (2019). Removal of acid dyes from textile wastewaters using fish scales by absorption process. *Clean Technologies*, 1(1), 311-324.
9. **Kabir, SMF.**, Chakraborty, S., Hoque, S. M., & Mathur, K. (2019). Sustainability assessment of cotton-based textile wet processing. *Clean Technologies*, 1(1), 232-246.
10. **Kabir, SMF.**, Rashid, T. U., & Negulescu, I. I. (2019). Gelation of textile dye solution treated with fish scales. *Gels*, 5(3), 37.
11. Hannan, MA, Haque, H, **Kabir, SMF.**, & Rahman, MMR (2019). Chemical-free scouring and bleaching of cotton knit fabric for optimum dyeing performance. *Clothing and Textiles Research Journal*, 37(4), 265–280.
12. **Kabir, S.**, Sikdar, P., Haque, B., Bhuiyan, M. R., Ali, A., & Islam, M. N (2018). Cellulose-based hydrogel materials: chemistry, properties and their prospective applications. *Progress in Biomaterials*, 7 (9), 1-22.
13. Hannan, M. A., Haque, P., **Kabir, SMF.**, Rahman, M. (2018). Scope of sustainable pretreatment of cotton knit fabric avoiding major chemicals. *Journal of Natural Fibers*, 15 (9).
14. Bhuiyan, M. R., Ali, A., Islam, A., Hannan, M. A., **Kabir, SMF.**, & Islam, M. N. (2018). Coloration of polyester fiber with natural dye henna (*Lawsonia inermis* L.) without using mordant: a new approach towards a cleaner production. *Fashion and Textiles*, 5(1), 2.
15. Iqbal, M., **Kabir, SMF.**, Rakib, M., Rashid, M., & Sikdar, P. (2018). Characterization of waste bamboo strips underscoring node effects. *Journal of Sustainable Construction Materials and Technologies*, 3(1), 163–173.
16. **Kabir, SMF.**, Iqbal, M., Sikdar, P., Rahman, M., & Akhter, S. (2014). Optimization of parameters of cotton fabric whiteness. *European Scientific Journal*, 10(No. 36), 200-210.
17. Hannan, M., Islam, M., **Kabir, SMF.**, Kafi, A., & Sheikh, S. (2014). Effect of yarn count & stitch length on shrinkage, GSM, and spirality of single jersey cotton knit fabric. *European Scientific Journal*, 10(No. 36), 188-199.
18. Hannan, M., Sheikh, S., **Kabir, SMF.**, Hossain, M., & Rouf, M. (2014). Scope of knit denim products using reactive dye and convenient washing effects. *International Journal of Recent Development in Engineering and Technology*, 5(No. 3), 1-9.
19. Nasir, S., Sarker, M., & **Kabir, SMF.**, (2014). CSR as a way of employee satisfaction and profit maximization. *Bangladesh Textile Today*, Volume no. 07(November).

#### Articles in Process/Review

1. **Kabir, SMF.**, Mathur, K., & Seyam, A.M. (2021). Maximizing the performance of 3D printed fiber-reinforced composites. *ACS Applied Materials and Interfaces* (under review).
2. **Kabir, SMF.**, Haque, S., (2021). A mini review on the innovations in sizing of cotton. *Journal of Natural Fibers*, (under review)
3. **Kabir, SMF.**, Mathur, K., & Seyam, A.M. (2021). Comparing performance of 3D printed and injection molded fiber-reinforced composite parts in ring spinning traveler application. *Journal of Composite Materials* (under review).
4. Akter, Maimuna; Rahman, Fahim; Abedin, M. Zainal ; **Kabir, SMF.**, (2021). Removal of reactive dyes from textile effluent using banana peel: isotherm, kinetic and thermodynamic studies. *Helvion*, (under review).

#### Conferences and Seminars

1. **Kabir, SMF.**, Mathur, K., Seyam A.M., (2020). Current research state of fiber-reinforced 3D printing technology. *The 3rd International Conference on Material Strength and Applied Mechanics*, December 6-9, 2020, Online Conference (Invited).
2. **Kabir, SMF.**, Mathur, K., Seyam, A.M., (2020). On the mechanics of 3d printed fiber-reinforced composites: assessment of tensile and impact of cellular structures, *2nd International Conference on Technical Textiles*, National Textile University, Faisalabad, Pakistan. February 18-20, 2020 (Invited).
3. **Kabir, SMF.**, Mathur, K., Seyam A.M., (2020, Spring). 3D Printed Fiber-Reinforced Composites, *Graduate Seminar*, Wilson College of Textiles, NCSU, Raleigh, NC, USA (Invited).
4. Seyam, A.M., **Kabir, SMF.**, Mathur, K., (2019). Impact resistance of 3D printed fiber-reinforced cellular composites. *International Conference on Innovative Textiles*, MLV Textile and Engineering College, Bhilwara, India, December 6-7, 2019 (Invited).
5. **Kabir, SMF.**, Seyam A.M, Mathur, K., (2019). Current research state of 3D printed fiber-reinforced composites. *International Society of Industrial Fabric Manufacturers*, Sringhill Suites by Marriott, Greenville, SC, October 21, 2019 (Invited)
6. Stannard, C. & **Kabir, SMF.**, (2018). Fishy Finery. Mounted Gallery Exhibit at the *International Textile and Apparel Association Conference*, Cleveland, OH, Nov. 6-9, 2018.
7. Hannan, M., Haque, P., **Kabir, SMF.**, & Rahman, M. (2017). Scope of sustainable pretreatment of cotton knit fabric without using chemicals – an environmental friendly approach. *2017 2nd Asia Conference on Environment and Sustainable Development (ACESD 2017)*, Tokyo, Japan.
8. Sheikh, S., **Kabir, SMF.**, Hannan, M., Khan, A. (2015). Effect of woven fabric structure on dimensional stability- a lead time saving approach for the sustainability of Bangladeshi woven industries. *International Integrative Research Conference on Governance in Transition: Perspective and Practice*. BARD, Comilla, Bangladesh.

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**INDUSTRIAL EXPERIENCE**


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**R & D Officer, Amazing Fashion Limited, Gazipur, Bangladesh**

July 2013-October 2013

- Reduced production bottleneck by balancing sewing line
- Reduced cost per minute by decreasing standard allocated minute through time study
- Implemented advanced workplace management tools such as 5S

**Intern, Knit Concern Ltd., Narayanganj, Bangladesh**

January 2013-March 2013

- Optimized costing and fabric consumption for apparel production
- Developed sewing line plan & line balancing for apparels
- Managed production lead time through time study analysis

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**ACHIEVEMENTS, SCHOLARSHIPS & HONORS**


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**Achievements**

- First merit position among the apparel majors at Textile Engineering College, University of Chittagong, Bangladesh
- First merit position in the written test of 'Textile Talent Hunt', 2012 (among 400+ participants from different universities in Bangladesh)

**Scholarships**

- Sweden-Bangladesh Travel Grant, Bangladesh, 2020, Dhaka, Bangladesh
- DE Fellowship 2018-2019, NC State University, NC, USA
- Neva Olsen Nolen Graduate Scholarship, 2016, LSU, LA, USA
- University Grant Commission Merit Scholarship, 2008-2011, Dhaka, Bangladesh
- Ibn-Sina Trust Scholarship, 2010, Dhaka, Bangladesh

**Invited Research and Academic Talks at**

- Dr. Wazed Miah Textile Engineering College, Rangpur, Bangladesh, March 16, 2021
- International Society of Industrial Fabric Manufacturers, , SC, USA, October 21, 2019
- Dhaka University of Engineering Technology, Gazipur, Bangladesh, July 2018
- Khulna University of Engineering and Technology, Khulna, Bangladesh, July 9, 2018
- Textile Engineering College, Chittagong, Bangladesh, July 27, 2018

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**ANALYTICAL, TESTING & DATA ANALYSIS**


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**Analytical Instruments**

- UV-Vis Spectroscopy
- Fourier-Transform Infrared Spectroscopy (FTIR)
- Scanning Electron Microscopy (SEM)
- Energy dispersive X-ray (EDS)
- X-ray Computed Tomography (nono-CT)
- X-ray Diffraction (XRD)
- Thermogravimetric Analysis (TGA)
- Stereo and optical microscopy

**Machines Operated**

- Sample dyeing machine
- Rotary and screen printer
- Textile testing (almost all physical and chemical testing related to fiber, yarn, fabric and apparel such as colorfastness, moisture management, abrasion, drape, fiber, yarn and fabric strength etc.)
- 3D printer
- Composite testing (tensile, impact, interlinear shear)

**Software Used**

- 3D printing
- Solidworks
- ImageJ

- JMP Pro
- Learning Management System (Moodle, Gradescopes, Mediasite)

### Programming language

- Basic of SAS
- Basic of Python

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## PROFESSIONAL DEVELOPMENT/CERTIFICATIONS

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- Exploratory Data Analysis, 4 hours, July 2020, provided by Statistical Analysis System (SAS), Carry, NC, USA
- Quality Methods, 4 hours, July 2020, provided by SAS, Carry, NC, USA
- Statistical Thinking and Problem Solving 4 hours, July 2020, provided by SAS, Carry, NC, USA
- Introduction to Python, 4 hours, May 2020 provided by DataCamp, NC, USA
- Introduction to Molecular Spectroscopy, 16 hours (4 weeks) July 2020 provided by Coursera, CA, USA

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## COLLABORATIONS & PROFESSIONAL VISITS

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### Industrial Collaboration

- AB Carter Inc, Gastonia, NC, USA Since July 2020
  - Established communication
  - Collaborated for a project titled “fiber-reinforced 3D printed composites”
- Big D’s Seafood, Franklin, LA April 2017-May 2018
  - Established communication
  - Collaborated for a project titled “management of fish waste”

### Plant Visited

- Saad Musa Textiles, Chittagong, Bangladesh December 2010
- Regent Textile Mills Ltd. Chittagong, Bangladesh December 2010
- Pahartali Textile & Hosiery Mills Warehouse, Chittagong, Bangladesh October 2009
- Dulamia Cotton Spinning Mills Limited, Sonargaon Road, Dhaka 1205, Bangladesh March 2008

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## LEADERSHIP & COMMUNITY INVOLVEMENT

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### Editor (Topical)

- *Textiles*, MDPI

### Invited Reviewer

- *ACS Applied Polymer Materials*, ACS publications
- *Carbohydrate Polymers, Additive Manufacturing*, Elsevier
- *Fashion and Textiles*, Springer
- *Journal of Industrial Textiles, Journal of Composite Materials, Journal of Reinforced Plastics and Composites, International Journal of Damage Mechanics*, Sage Publications
- *Starch*, Wiley
- *Journal of Testing and Evaluation*, ASTM
- *Indonesian Journal of Chemistry*, Universitas Gadjah Mada
- *Current Materials Science*, Bentham Science
- *Tekstilec*
- *Journal of Composite Science*, MDPI

### Leadership/Memberships Affiliations

- Member of Society of Plastic Engineers (SPE), USA
- Member of BACABANA and Treasurer NC State Chapter, NC, USA
- Former member of AATCC and Treasurer at LSU Chapter, LSU, USA
- Founding president of ‘CTEC English Club’ (a language club), Textile Engineering College, Chittagong, Bangladesh
- Volunteered for ‘Anirban’ (a philanthropic organization), Textile Engineering College, Chittagong, Bangladesh
- Volunteered for fund raising for Mechanical Graduate Student Association (MGSA), and Bangladeshi Student Association (BSA), LSU, USA

## TRAININGS & SEMINARS PARTICIPATED

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- 3D printing for different stages of learning, July 2020 with MakerBot
- Replacing metal with 3D printed carbon fiber parts, May 2020 with MakerBot
- Impact Failure of Plastics, June 2020 with Society of Plastic Engineers (SPE), USA
- Data Security Training, 2019, NCSU, USA
- Engineering Cafes: Compelling Introductions and Abstracts, NCSU, USA
- Engineering Cafes: Professional Emails, NCSU, USA
- Fire Safety Training, NCSU, USA
- Ethics Training for Public Servants, Louisiana Board of Ethics, November 27, 2016, LA, USA
- Protecting Human Research Participants, National Institute of Health, August 27, 2017, USA
- Preventing Sexual Misconduct Training for LSU Employees, December 6, 2016, LSU
- How to success at interview: University of Sheffield, UK,
- A Beginner's Guide to Writing in English for University Study: University of Reading, UK
- Two months long industrial attachment done in Knit Concern, Narayangonj, Bangladesh
- Seminar on Textile Manufacturing organized by Textile Talent Hunt Team on 29 August 2012, Gulshan, Dhaka
- Seminar on Personal Branding and Research Methodology organized by Textile Talent Hunt Team on 30<sup>th</sup> August 2012 at NITER, Savar, Dhaka

## REFEREES

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- **Dr. Abdel-Fattah M. Seyam**  
Charles A. Cannon Professor of Technology  
Alumni Association Distinguished Graduate Professor  
Wilson College of Textiles, NC State University, Raleigh, NC, USA  
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- **Dr. Kavita Mathur**  
Associate Professor, Textile and Apparel Technology and Management  
Wilson College of Textiles, NC State University, Raleigh, NC, USA  
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- **Dr. Mohammad Sujauddin**  
Assistant Professor, Department of Environmental Science and Management  
North South University, Dhaka, Bangladesh  
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