

# **Excellence in Teaching Award Portfolio: Dr. Hasitha Mahabaduge**

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February 22, 2019

Dear Members of the Excellence in Teaching Award Committee,

It is my pleasure to nominate Dr. Hasitha Mahabaduge for the 2018-19 Excellence in Teaching Award. His caring nature as an educator, his successful teaching pedagogies, his contributions to strengthening our physics program curriculum by developing three new courses, the community outreach activities he conducts as part of his coursework, and his unending quest to learn and implement new teaching techniques make him an excellent candidate for the Award for Excellence in Teaching.

Over the past three years, Dr. Mahabaduge voluntarily taught one course overload every year. On all three occasions, he volunteered to teach these courses solely because students requested him to teach them. For example, in Fall 2016, our graduating seniors requested a renewable energy course out of a desire to learn and develop the necessary skills to enter the growing field of renewable energy. To address their needs, Dr. Mahabaduge developed and offered the course Physical Principles of Renewable Energy. He did the same in 2017 and 2018 and taught two more courses just to help students graduate on time. He taught these courses on top of his regular 4/4 course load. In my opinion, this demonstrates that he cares for his students and goes the extra mile to help them. His caring nature is a recurring theme in student evaluations as well. Below, I quote one of the student comments that reflects this great attribute of him as an educator.

“The professor seemed to genuinely care about his students and wanted them all to succeed. If there was a student that did not understand a concept, the professor tried several different methods and approaches to help not only the confused student, but the entire class in general to better understand topics. He made a potentially dreadful class much less so by always having a great attitude and knowing when to make physics related jokes or physics related real world experiences, which really made the class more enjoyable.”

Dr. Mahabaduge joined Georgia College with a strong research background. He has found ways to successfully integrate research into course work to share his expertise not only with his research students but also with all students who take upper level courses with him. Some of his students (not research students) have presented their course work research both local and regional conferences, including Georgia College Student Research Conference, Georgia Undergraduate Research Conference, and Southeastern Section of the American Physical Society meeting. It is worth mentioning that the retrofitted solar golf cart research project, which gained regional and national attention, was initiated as a research project for one of his classes ([https://www.cur.org/georgia\\_college\\_students\\_use\\_summer\\_sun\\_to\\_power\\_golf\\_carts/](https://www.cur.org/georgia_college_students_use_summer_sun_to_power_golf_carts/)). This Fall, he also co-presented one of our Center for Teaching and Learning Workshops on "Integrating undergraduate research into a course and across the curriculum." Dr. Mahabaduge also collaborates with our librarians to teach our students necessary skills in information literacy. He started this collaboration as part of his Russell Library Fellows program but continues it due to the benefits gained by his students.

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*Georgia College & State University, established in 1889, is Georgia's Public Liberal Arts University.  
University System of Georgia*

So far, Dr. Mahabaduge has developed and offered three new courses: Solid State Physics, Thermodynamics, and Statistical Mechanics, in addition to his course in Renewable Energy, to make our physics curriculum on par with the physics curricula throughout the rest of the country. He is also a member of the physics curriculum committee. The committee recommended making two more courses: Advanced Electricity and Magnetism and Advanced Quantum Mechanics required for graduation. This change, along with the new courses taught by Dr. Mahabaduge, make our graduating students well prepared for continuing their graduate studies. Specifically, the Thermodynamics and Statistical Mechanics (and Electricity and Magnetism) courses he taught had a significant impact on students' scores in their GRE Physics test.

In Fall 2016, Dr. Mahabaduge started a renewable energy workshop series to local elementary school students and part of his Physical Principles of Renewable Energy course. This workshop gained much interest from the teachers of the local elementary schools, and he has offered it every year since then (<https://frontpage.gcsu.edu/article/news/power-fun-physics-students-energize-science-elementary-school-kids>). He makes this part of the course work for capstone courses he teaches and makes it relevant for both elementary school students as well as our students by picking a theme that matches the respective capstone course.

One of the best things I like about Dr. Mahabaduge is he models himself not only as an educator but also as a good learner. He was part of the University System of Georgia Scholarship of Teaching and Learning (USG SoTL) fellows program during 2017-2018, he is part of the GC active learning fellow cohort for the 2018-2019. He has presented several times in regional, national and international teaching and learning conferences. One key thing I would like to highlight here is that he presented twice with his students in the USG Teaching and Learning Conference in 2017 and 2018, and once in the SoTL Commons conference in January 2019.

I would also like to add that as one of the experimental physics researchers in the department, Dr. Mahabaduge maintains an active research group mentoring 8-10 students every year. Over Summer 2018, he also mentored two high school students. His students' research presentations have also won recognition and awards (<https://frontpage.gcsu.edu/announcement/physics-major-wins-honorable-mention-poster-competition-energy-summit>)

Dr. Mahabaduge is clearly an inspiration for both his students and fellow faculty, and I sincerely believe that he deserves to be recognized for the excellence in his teaching.

Respectfully



Dr Ken McGill  
Chair Chemistry, Physics and Astronomy Department  
Georgia College

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27 February 2019

Dear Faculty Award Selection Committee,

I write to nominate **Dr. Hasitha Mahabaduge** from the Department of Chemistry, Physics, and Astronomy for the Excellence in Teaching award. Based on the strong, detailed letter of support from his department chair, I can recommend him without reservation as an excellent teacher worthy of this award.

While coming from a research background in physics, Dr. Mahabaduge has emerged as one of the most innovative and engaging professors in the college. He has made learning physics fun, as his enthusiasm for the subject is contagious with students. He has been very active in undergraduate research. The most notable of these efforts has been the project he has guided with several students on the solar-powered golf cart. In addition to creating three new vital physics courses (Solid State Physics, Thermodynamics, and Statistical Mechanics), he has often taught overloads and created courses to allow students to get additional classroom experience to better align with either their graduate school or career objectives.

His passion for teaching extends beyond the GC classroom into the community at large. For example, Dr. Mahabaduge has reached out to the community schools to share his passion for renewable energy, and he takes his energy workshop on the road annually to teach elementary school-aged students about the importance of this subject. Further, he has incorporated the scholarship of teaching and learning into his portfolio here at Georgia College as a member of the GC active learning fellow cohort and as another avenue for research dissemination for his students.

In sum, Dr. Mahabaduge's excellence in teaching is truly preeminent and I believe merits the Excellence in Teaching award for 2018-19.

Cordially,

Eric G. Tenbus, PhD  
Dean, College of Arts and Sciences  
Professor of History  
eric.tenbus@gcsu.edu



**BOARD OF REGENTS OF  
THE UNIVERSITY SYSTEM OF GEORGIA**

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15 February 2019

Jeanne Sewell, MSN, RN-BC  
Co-Director, Center for Teaching and Learning  
Georgia College & State University  
231 W Hancock St.  
Milledgeville GA 31061

Dear Jeanne Sewell,

As co-directors of the University System of Georgia (USG) Scholarship of Teaching & Learning (SoTL) Fellows Program, we are pleased to write this letter in support of Dr. Hasitha Mahabaduge for Georgia College's Award for Excellence in Teaching. The USG SoTL Fellows program was created to foster and support a community of learners from across the USG who meet over the course of a year to design and implement a classroom-based research project.

In looking over the criteria for this award—1) use of effective teaching strategies, 2) strongly committed to teaching and learning, and 3) commitment to fostering academic success of students—it is evident that SoTL cuts across the boundaries of all three of these qualities. In our work with Dr. Mahabaduge as a 2017-2018 USG SoTL Fellow, we likewise saw evidence of how his philosophy of teaching-as-research cuts across these boundaries. In Dr. Mahabaduge's own words, "Teaching as Research involves systematic and reflective use of research methods to develop and implement teaching practices that advance the learning experiences and outcomes of students and teachers."

The topical focus of the 2017-2018 USG SoTL Fellows cohort was American Association of Colleges & Universities' (AAC&U) Liberal Education and America's Promise (LEAP). LEAP is a set of practices, tools, and ideals designed to prepare students for the 21st century workplace by creating engaged and informed citizens who are capable of higher levels of learning as well as strong intellectual and practical skills. Dr. Mahabaduge's work with the USG SoTL Fellows led to a number of projects that incorporated principles of LEAP into his courses, including such High-Impact Practices (HIPs) as signature work and capstone projects. His USG SoTL Fellows research project, "Impact of integrating undergraduate research and students' signature work into coursework on student learning," demonstrates a contribution to the national LEAP project. The quality of his work with the USG SoTL Fellows is evidenced in the three oral presentations and one poster presentation that he completed, an impressive number for a year-long program.

As Dr. Mahabaduge has suggested to us, his work with LEAP promotes students' signature work to prepare them to complete a substantial cross-disciplinary project in a topic significant to the student and society. In two upper-level physics courses, he integrated hands-on research and community-based projects designed to let students pursue their own signature work, applying the knowledge they gained from the course. This kind of project promotes student motivation and mastery, two elements of deep learning. The students retrofitted a solar powered golf cart and conducted renewable energy workshops for elementary schools as part of their course work. Linking the real world to the book work of physics is a hallmark of teaching excellence through the integration of research, teaching, and service -- both for the professor and the students. The project for retrofitting a solar powered golf cart is a classic example of students' signature work promoted by the LEAP initiative.

Dr. Mahabaduge's research examines the impact of signature work with intentionally integrating undergraduate research (one of LEAP's HIPs) into course work on student learning and employability. He helps students bridge the college and work divide by including them in real-world experiences. For instance, he and a student co-presented at the 2018 USG Teaching & Learning Conference, with the student sharing on his experiences one year after graduation and the impact of having completed a signature work as part the course. Dr. Mahabaduge's professional support for students in his classes and his lab create enduring working relationships.

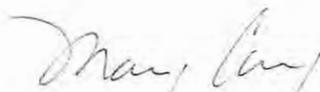
Dr. Mahabaduge's teaching excellence is evident not only in innovative, evidence-based teaching but extends to sharing how faculty development can enrich teaching. He presented with his peers at the 2018 USG Teaching & Learning Conference a session entitled, *SoTL Communities of Practice for Research on Teaching and Learning*. He is already a rising star in Georgia's active SoTL community. Further, he was an exemplary member of the learning community and was generous with his colleagues in sharing his already significant knowledge of the intersection of teaching and research.

As co-directors of the USG SoTL Fellows program, we have the privilege of working with outstanding faculty from across the state. Dr. Mahabaduge is exceptional among this group, and he is exemplary of the highest level of integrating research and teaching to achieve greater student outcomes.

Sincerely,



Denise P. Domizi, Ph.D.  
Director of Faculty Development  
Co-Director, USG SoTL Fellows program  
University System of Georgia



Mary Carney, Ph.D.  
Professor English  
Co-Director, USG SoTL Fellows Program  
Director, Center for Teaching, Learning, &  
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February 17, 2019

Dear Awards Selection Committee,

It is my pleasure to write a letter on behalf of Hasitha Mahabaduge for the Excellence in Teaching Award. Dr. Mahabaduge recently completed the semester long course, "Design for Transformative Learning" (DTL). This course met 2 hours per week face to face with an hour or more of work on course design outside of class. The primary goal of the course is that participants create an innovative, engaging and meaningful course designed to a) help students understand the course content as deeply as possible b) allow students to remember and apply key concepts even years later, and c) develop agile thinkers with broadly transferable essential skills. I was particularly impressed with the individuals who were in Dr. Mahabaduge's section of the course because, not only were they willing to be the first cohort to take a course requiring this level of time and dedication, they were willing to do it on Friday afternoons from 3:30-5:30! Now THAT is real dedication to the art and craft of teaching!

As a result of this course, Dr. Mahabaduge now has a solid vision for a new version of "Principles of Physics II" along with a variety of materials such as course goals, a dilemma, issue or question to guide the course, an introductory letter to students, and sample lesson plans and activities. He has also developed an authentic assessment using the performance task framework and learned UNLV's "Transparency in Teaching and Learning" protocol to increase the chances of student success on assignments. Furthermore, he is now prepared to "flip" parts of a course when that is a viable option, and he is developing a signature pedagogy for the course based on the concept of physics tutorials. After teaching this course for a semester or two to tweak it, it should be at the level of a publishable course that could be shared and used by others nationwide.

The DTL course also focuses on helping students develop skills that will benefit them throughout their time in school and across their lives and careers. For example, Dr. Mahabaduge is now prepared to help students improve their ability to learn, process, and review and also help them develop persistence, academic mindset, and grit. But perhaps most importantly, he is one of the first faculty members at Georgia College to focus on teaching a transferable essential skill in a way that will allow the students in the class to acquire that skill in such a way that they can apply it not only to the topic at hand but also to a wide variety of other topics and situations. The essential skill he has chosen to focus on

for this course is quantitative literacy. Hopefully his course can serve as an exemplar as we work as a university to ensure that all courses develop essential skills in this way.

But Dr. Mahabaduge's teaching excellence isn't confined only to the classroom. GC Journeys featured the work of one of the students he mentored as part of a "mentored undergraduate research" project in one of our videos. Of all the examples of mentored research on campus, we knew his project was particularly exciting for many reasons. First of all, it beautifully exemplifies the criteria for high quality mentored research. Secondly, the project wasn't just purely theoretical but made a practical contribution to sustainability efforts on campus. But perhaps most importantly, the student representative from that research team couldn't hide his incredible enthusiasm for the project, and his ability to explain the project in detail was extraordinary. That enthusiasm and that student's ability to explain in such detail – those speak volumes about the quality of Dr. Mahabaduge's teaching.

Dr. Mahabaduge's devotion to developing the pedagogy of physics is extraordinary. He is starting with this focus in a serious way at such a young age that I wouldn't be surprised if he is able to become one of the foremost authorities on this subject. In future semesters, he will be helping me teach the DTL course, specifically the sessions on developing peak performance and flipping the classroom.

Sincerely,

A handwritten signature in cursive script that reads "Cynthia J. Alby". The signature is written in a light grey or blue ink and is positioned below the word "Sincerely,".

Professor of Secondary Education  
Director of GC Journeys



Mentored Undergraduate Research & Creative Endeavors (MURACE)  
A Division of the Center for Teaching & Learning  
Library Room 375  
Milledgeville, GA 31061  
478-445-0966

February 11, 2019

To Whom It May Concern:

Re: Faculty Teaching Excellence Award Nominee for Hasiha Mahabadi, Ph.D.

It is my honor as the Faculty Coordinator for MURACE to write this letter supporting Dr. Mahabadi for this great award.

A significant difference between an excellent classroom teacher and an excellent teacher is Dr. Mahabadi. He exemplifies the "excellence in teaching beyond the classroom." The time he spends beyond classroom lecture time is not because he gets paid to mentor students beyond the classroom it is because he is an excellent teacher. He mentors students and seeks out opportunities for his students to present their research at conferences, gain summer research funding (e.g., MURACE and REUs), and secure quality competitions where students can demonstrate their knowledge and learn from others. Dr. Mahabadi also conducts and presents pedagogical research at conferences such as the OSG Teaching and Learning Conference. He serves as a Councilor for the Council on Undergraduate Research for the Physics Division where he shares and gains knowledge that he brings back to GC Physics students. He serves on the Professional Learning Committee for MURACE where he shares and gains valuable knowledge to move GC students successfully through and beyond their GC Journeys. He prepares students for both the work world and graduate school.

As Georgia College & State University (GC), embarks on its GC Journeys' Program (High Impact Practices), having Dr. Mahabadi as a contributing faculty member makes the journey to success for GC students interested in engaging in undergraduate research possible. Since joining GC, Dr. Mahabadi has demonstrated a remarkable commitment to mentoring undergraduate research. The following are some examples of his dedication that I have personally observed that reflect the attributes of an excellent teacher.

Involvement outside the classroom:

- 1) REUs - conducted research along with his GC undergraduate student at the University of Nebraska Lincoln in 2017 - not only did he work with his student, but his collaboration was a game changer for the students. It is remarkable that an undergraduate student is a beneficiary of an opportunity from a grant. His inspiration helped Nowsherwan Sultan to gain a clear vision for his future educational direction. However, Dr. Mahabadi's connection to REUs does not end there. He inspired another undergraduate to apply for an REU program for the summer of 2018.
- 2) Grants - wrote grant to purchase equipment for the laboratory he developed at GC - It is wondrous to have a new faculty member so willing and able to support undergraduate research; however, to start a lab and find funding to purchase much-needed equipment within his first year is remarkable. The presence of the lab provides students with the opportunity to conduct exceptional research that is conference and journal worthy.
- 3) Service to Students - When I approach Dr. Mahabadi about serving on the GC Student Research Conference and GURC Conference Committees, and GURC Posters at the State Capitol; his response was "yes" not let me think about it. The various committees carry responsibilities such as reviewing abstracts, preparing presentation schedules, handling conference logistics, marketing the conference, selecting quality research for the COPLAC Conference, and much more. Further, in 2017, when asked if he would accompany ten students who were selected to present their research at the Council on Public Liberal Arts Council (COPLAC) Conference, once again the response was yes. That informed yes, meant meeting with the students prior to the conference, traveling to a not so exotic location, instead to "Wise Virginia", giving up his weekend, attending the presentations, networking with other COPLAC faculty and administrators as a representative of GC MURACE, and after the conference communicating with MURACE to share insights and outcomes from the conference. His teaching excellence can be seen through his contributions to his students by mentoring, preparing, and accompanying them to participate in discipline specific and interdisciplinary conference (e.g., COPLAC, GURC, NCUR). Through his work by contributing to these organizations, he assures the quality that is

expected by an excellent teacher exists within each, and through sharing these informed opportunities with his students and mentoring his students he exemplified an excellent teacher.

- 4) Member of the MURACE Professional Learning Committee - As part of the MURACE Professional Learning Community (PLC), Dr. Mahabaduge has made significant time and work contributions to the new GC Journeys initiative. In his role he worked with a team to identify undergraduate research (UR) best practices models, cull through journal articles to find the top articles needed to provide direction to the initiative, assisted in determine the most appropriate Essential Learning Outcomes for GC Journeys to pursue, identify assessment tools all in an effort to map a pathway to success for our UR students. From his continuing work, he brought the idea to the team of presenting the work at the CTL Conference in Athens Georgia in April, 2018. His enthusiasm was and is infectious, and the team agreed to coauthor the presentation. What Dr. Mahabaduge presented represented the quality of teaching that he and the team members exemplify at GC.
- 5) GALA poster presenter - in 2017, it was my privilege to identify ten exception undergraduate researchers from across the GC campus to present at the GC GALA (capital funding campaign event). Dr. Mahabaduge's student was selected as one of the ten. Dr. Mahabaduge worked tirelessly teaching his student to present in the way needed to communicate research to university donors, potential donors, and politicians who may or may not understand the technical language of the discipline. This ability is quite a feat for anyone let alone an undergraduate researcher in the sciences. Therefore, Dr. Mahabaduge had his job cut out for him. He did an excellent job. He stayed by his student side to assist when needed during the presentation time and then spent time during the meal sharing his discipline's research initiative and his students' potential as future physicists and researchers as well as the benefits UR brings to GC.
- 6) CUR Councilor Physics Division - Dr. Mahabaduge is a CUR Councilor in the Physics Division. By being nationally elected to this position is a clear indication that other CUR Councilors were able to see the greatness he brings to national UR efforts. His intellect, skills, love of teaching, and enthusiasm for undergraduate research goes well-beyond the walls of our university.
- 7) NCUR - since the beginning of his time at GC Dr. Mahabaduge has been a strategic part of NCUR, both through the mentoring of students to present at NCUR, but as a presenter in the Faculty Administrator Network (FAN). FAN sessions are very limited as to the number accepted, but because of the excellence he brings to mentoring outside the classroom he has been continuously successful in securing his rightful place as a presenter.

It is my great pleasure to work with this great person. I say, great person, because he is not just an excellent classroom teacher, but also a great mentor for undergraduate researchers, a great colleague, and a genuinely collegial person. Working with him and seeing his great works and dedication to students at multiple levels made writing this recommendation a pleasure. I hope that you agree and will award Dr. Mahabaduge the recognition of Excellent Teacher.

Sincerely,



Doreen (Dee) Sams, Ph.D.  
Faculty Coordinator for MURACE  
CUR Councilor Social Sciences  
CUR Campus Liaison

Jeff Dowdy  
Graduate Librarian  
Ina Dillard Russell Library  
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[jeffrey.dowdy@gcsu.edu](mailto:jeffrey.dowdy@gcsu.edu)

Jeanne Sewell, MSN, RN-BC,  
Co-Director, Center for Teaching and Learning

February 19, 2019

Dear Jeanne,

I am writing to give account of my partnership and observation of Hasitha Mahabaduge's role as teaching faculty at Georgia College and in support of his nomination for the Excellence in Teaching Award.

In 2016, Dr. Mahabaduge successfully applied for Russell Library's Faculty Fellows project. Thus began a partnership between Dr. Mahabaduge and me in his Physics Special Topics classroom. Perhaps the culmination of that first semester of working with Hasitha best illustrates his commitment to effective teaching strategies and student learning. Over the course of the semester, as part of the project, students were to research a special interest in renewable energy. We met with the class at the beginning of the semester to give research strategies for their topics with the goal of deepening their understanding of the scholarly conversation on their topic. At the end of the semester, Dr. Mahabaduge and his class invited area elementary students to Georgia College to learn from his students about renewable energy. The students rotated through several stations – including a ride in a solar-powered GC golf cart – to see renewable energy in practice. I was impressed with the students' ability of taking a complicated topic and explaining it to a young audience. Several things were happening at once: the students understanding of their topic was deepening and being expressed, young minds were being turned on to STEM education, sustainable living was promoted, and all of it was a reflection to Dr. Mahabaduge's work in the classroom.

Since that first semester our work together has continued. We have done similar work with other special topic courses, including quantitative measurement of student gains in information literacy. To me Hasitha's willingness to include information literacy into a physics course has shown both his understanding and commitment to student learning and success beyond the classroom. He understands and works to build the soft skills like information literacy and presentation skills into his students within the context of serious research.

Dr. Mahabaduge has also shown himself to be a great champion of Georgia College beyond the campus and a serious contributor to the professional development of others through his presentations from regional to international conferences. I participated on a panel with Hasitha at a recent Scholarship of Teaching and Learning conference and was witness to what a great example he is of our liberal arts mission (even in the physics classroom). He is a leader in his field both by directly influencing our graduates and indirectly by challenging other STEM faculty to consider soft skills as an essential part of the classroom.

Please accept my enthusiastic support of Hasitha for the Excellence in Teaching award.

Sincerely,

Jeff Dowdy

# Hasitha Mahabaduge

Georgia College and State University  
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Milledgeville, GA 31061

e-mail:  
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cell: 419-480-7532

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## EDUCATION

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The University of Toledo, Toledo, OH, USA  
**Doctor of Philosophy**, Physics, December 2013

The University of Colombo, Colombo, Sri Lanka  
**Bachelor of Science** (Honors in Computational Physics), July 2007

## PROFESSIONAL EXPERIENCE

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Jan. 2016–present: **Assistant Professor**, Georgia College & State University, Milledgeville, GA, USA

June 2017–Aug 2017: **Summer Faculty Research Fellow**, Materials Research Science and Engineering Center, University of Nebraska – Lincoln, NE, USA

Feb. 2014– Dec. 2015: **Postdoctoral Researcher**, National Renewable Energy Laboratory (NREL), Golden, CO, USA

May 2009–Dec. 2013: **Research Assistant**, University of Toledo, Toledo, OH, USA

Aug. 2008–May 2009: **Teaching Assistant**, University of Toledo, Toledo, OH, USA

July 2007–June 2008: **Physics Instructor**, University of Colombo, Colombo, Sri Lanka

## AWARDS & FELLOWSHIPS

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- 2018 – College of Arts and Sciences Excellence in Teaching Award
- 2018 - Georgia College Center for Teaching and Learning Active Learning Fellow
- 2017-2018 - University System of Georgia Scholarship of Teaching and Learning (USG-SoTL) Fellow, selected from the colleges and universities in the University System of Georgia to foster a community of learners around SoTL.
- 2017- Materials Research Science and Engineering Center (MRSEC) Summer Research Fellowship, University of Nebraska – Lincoln
- 2016 - The Russell Library Faculty Fellow, for implementing a collaborative project between Georgia College librarians to intentionally integrate library resources into the academic course, Physical Principles of Renewable Energy.
- 2015 - National Renewable Energy Laboratory Director's Award, for outstanding efforts to develop high efficiency CdTe photovoltaic devices on flexible glass substrates.

## GRANTS

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- 2018 – Georgia College, College of Arts & Sciences Faculty Development Grants (\$ 2,600)  
Project: Solar Charging Station for Education and Research
- 2018 – Georgia College ENGAGE mini grant (\$ 2500)  
Project: Connecting with the Community: Using Renewable Energy to Power Comprehension and Change

- 2018 – Georgia College MURACE Summer Research Grant (\$ 7500)  
Project: Optimization of Solar Powered Golf Carts at Georgia College
- 2017 - Georgia College Student Technology Fee Grant (\$ 18,400)  
Project: Magneto-optical Kerr Effect Measurement System for solid state research
- 2016 - Georgia College Student Technology Fee Grant & funding matched by the Department of Chemistry, Physics & Astronomy (\$ 60,000)  
Project: Multi-source sputtering chamber for thin film deposition
- 2016 – Georgia College Faculty Research Grants Award (\$ 5,000)  
Project: Spectrometer system for sputter deposition monitoring
- 2016 - Georgia College Student Technology Fee Grant (\$ 18,400)  
Project: Hall-Effect Measurement System for thin film characterization
- 2016 – Georgia College, College of Arts & Sciences Faculty Development Grants (\$ 1,600)  
Travel grant to attend the 1<sup>st</sup> World Congress of Undergraduate Research in Doha Qatar

## **PROFESSIONAL DEVELOPMENT**

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- New Physics and Astronomy Faculty Workshop, American Association of Physics Teachers. College Park, MD. (November 2017): The workshop introduces the faculty members to effective and easy-to-implement interactive engagement teaching methods
- Georgia College ENGAGE Apprentice Cohort (2017): to develop and assess Community-based Engaged Learning (C-bEL) experience that aligns with the ENGAGE Learning Outcomes and incorporates intentional assessment of student learning.
- Participated in Scholarship of Teaching and Learning Fellows Program conducted by the Center for Faculty Development of Georgia College in Fall 2016.
- Participated in a NSF funded five-day workshop, “Summer Teaching as Research Institute for Post docs in Engineering” conducted by the Teaching Institute for Graduate Research Education of University of Colorado Boulder in July 2014.
- Leadership for Educators: Academy for Driving Economic Revitalization in Science (LEADERS), University of Toledo, Toledo, OH (2013)

## **RESEARCH INTERESTS**

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- Photovoltaic device fabrication and characterization
- Physics Education

## **PUBLICATIONS (Peer Reviewed Journals/ Conference Proceedings)**

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- 6 peer reviewed journal publications
- 28 conference proceedings and presentations (5 with undergraduate student co-authors)

## **SCHOLARSHIP OF TEACHING AND LEARNING (Conference presentations)**

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- 12 conference presentations in Teaching and Learning conferences within the past three years (4 with undergraduate student co-presenters, refer supporting documents)

## Reflective Statement

I learned about teaching by observing my father, who is a high school teacher. He conducted tutoring sessions in the evenings at our home, and I used to sit nearby and listen. Though I was leaning towards becoming an educator from a young age, the decisive moment of me becoming a teacher was my participation in a five-day workshop, “Summer Teaching as Research Institute for Post docs in Engineering,” held at the University of Colorado. This experience also gave me my mantra for teaching: Teaching as Research, which involves systematic and reflective use of research methods to develop and implement teaching practices that advance the learning experiences and outcomes of students and teachers.

Since my first semester at Georgia College, (GC) I have worked closely with the Center for Teaching and Learning to learn best practices in teaching and learning and implement them in my courses. For example, I used tutorials developed by the Physics Education Research Group at the University of Washington in my introductory courses. I modified some of the tutorials based on student feedback. These tutorials helped build students’ confidence, as indicated by one of the student’s comments in course evaluations: “Great teacher! I was scared coming into physics, but it ended up being one of my favorite classes. The tutorials he made were awesome and so helpful....” When I teach upper level courses, I strive to prepare my students for their careers by teaching the essential skills sought by employers, such as critical thinking written and oral communication, and information literacy. by integrating research into course work and using Community-based Engaged Learning (C-bEL) techniques.

I believe continuous professional development and use of new technologies is necessary to be an effective educator. I became one of the Fellows in the GC Active Learning Fellows program, knowing that I needed to reevaluate my teaching techniques and leverage technology to complement the classroom experience in order to teach my Generation Z students more effectively. I was also one of ten University System of Georgia Scholarship of Teaching and Learning Fellows for the year 2017-2018. During Fall 2018, I took the semester long course, “Design for Transformative Learning” from Dr. Cynthia Alby and worked on developing a signature pedagogy for one of the introductory courses.

As an experimental physicist, I maintain an active research laboratory focusing on renewable energy applications. This gives me a great opportunity to mentor research students one-on-one. Working with my students from the conception of a research question through presenting their findings at conferences not only reminds me why I decided to become a faculty member but also pushes me to become better day by day so that I can serve them more. One of the joyous occasions of my teaching career was when one of my research students selected me to honor as his most respected professor during his collegiate career during the Faculty/Staff appreciation night held on January 31, 2018 at Centennial Center.

I conclude by sharing one of the comments a student wrote in the course evaluation, which sums up my teaching philosophy, Teaching as Research: “This course was very different from any course I have taken at GC in my college career... **He actively participated in learning with the students in a collaborative effort** which made the class much more interesting.”

## **Summary of Innovative Teaching Artifacts and Practices Used in the Classroom to Promote Student Success**

### **1. Use of evidence based teaching pedagogy**

Research indicates significant improvement in student conceptual understanding of physics topics after instruction with *Tutorials in Introductory Physics* at the University of Washington, Seattle, Washington. I implemented this evidence based teaching pedagogy in one of my introductory physics course and observed a significant impact on how students perceive both instructor and the course as indicated by the highlighted rows under Student Evaluation Responses (page 19, supporting documents). I implemented this for the first time in Spring 2018. Average adjusted scores for Excellent Teacher and Excellent Course increased by 1.0 point on a 5.0 scale from Fall 2017 to Spring 2018 for the same course. This provides solid evidence for how the effective use of evidence based teaching strategies can help educators better serve our students, especially in introductory physics courses where students walk in with a preconception of “Physics is hard.” With the help of Dr. Cynthia Alby, now I am in the process of developing my signature pedagogy based on physics tutorials and integrating flipped classroom techniques.

### **2. Intentionally integrating research and library instructions into coursework**

In the information age, available electronic resources are often a barrier for students, as they have difficulty identifying information needs. To remedy this issue, I collaborated with a librarian to teach key information literacy skills to students to prepare them to seek out current and reliable information on the respective upper level undergraduate courses I teach. I also have successfully integrated research into coursework and have shared my success stories in both regional and international conferences. I am part of the Georgia College Professional Learning Community for Mentored Undergraduate Research and Creative Endeavors (PLC MURACE group). We conducted one of our CTL workshops during the Fall 2018 titled, “Integrating undergraduate research into a course and across the curriculum.” and presented at the University System of Georgia Teaching and Learning (USG T&L) Conference in 2018.

### **3. Using LEAP signature work and C-bEL techniques**

Recent research suggests that college graduates, across a variety of institutional types, are not well prepared for entering the workforce, which is problematic for both institutions of higher education and potential employers. The Community-based Engaged Learning, C-bEL projects for upper level physics courses were designed to let students pursue their own signature work promoted by the Liberal Education and America's Promise, LEAP initiative, applying the knowledge they gained from the respective courses. These projects provide students with numerous opportunities to engage with hands-on learning in order to develop the critical thinking skills that are crucial to evaluate, synthesize and construct their own insights. According to the Association of American Colleges & Universities (AAC&U) 2018 employers survey, 90% of hiring managers consider being “able to effectively communicate orally” as the most important skill they look for in recent college graduates. In order to prepare my students to be competent communicators, they were given the opportunity to present three times during the semester and were also peer evaluated using Toastmasters International evaluation criteria.

Dear Members of the Awards Selection Committee,

I am a recent graduate of Georgia College, where I received my Bachelor of Science in Physics, and I was recently accepted into the Ph.D. program for Physics at the University of Tennessee at Knoxville. My time learning from and working with Dr. Hasitha Mahabaduge has been an essential part of my academic career, and I am honored to recommend him for this Award for Excellence in Teaching. When I first met Dr. Mahabaduge, I was in his Electricity & Magnetism course and I was the supplemental instruction leader for his Principles of Physics I course, a position I would maintain for three semesters. From the first of his classes I attended, I could tell he had a joy for teaching, highlighted by characteristics from his willingness to joke about physics to his ability to use physical laws as a life lesson. He has a clear desire to reach out to all students, evident from his almost stubborn attempts to ensure students have a clear understanding of each concept. As someone who hopes to one day become a physics professor, learning from Dr. Mahabaduge was extremely important in securing my desire and joy to teach.

In each course I have had with Dr. Mahabaduge, he has made it his mission to engage students as much as possible, going beyond lectures and exams by encouraging class discussion, which is almost unheard of in a STEM subject, and making research or community outreach programs a part of the coursework. In his Thermodynamics class, each student worked on and presented demonstrations on renewable energy to local elementary school students, which helped us see the application of the course material beyond problems found in a textbook. For his Advanced Electricity & Magnetism course, we did research on tandem solar cells, so that we saw the application of the photovoltaic effect. Not only did this help deepen our understanding of the course material, but we were able to present this research at two conferences, the Georgia Undergraduate Research Conference (GURC) and the annual meeting of the Southeastern Section of the American Physical Society (SESAPS). This was particularly helpful for me since the University of Tennessee was my first choice for graduate school and they hosted the meeting of SESAPS that year. I was able to present research to potential future faculty as well as network with those in their physics department. Dr. Mahabaduge's level of student engagement in the courses he offers demonstrates how invested he is in his student's learning beyond classroom.

Dr. Mahabaduge cares for his student's success, not only at Georgia College, but in their future endeavors as well. For those pursuing an advanced degree in physics, one of the largest obstacles is the GRE Subject Test in Physics. A notoriously difficult test, preparing for it takes months of practice and studying, which can add to an already stressful schedule as a college student. In the two upper-level courses I had with Dr. Mahabaduge, however, he incorporated GRE preparation into his coursework, which helped me to achieve a high enough score to be accepted into a competitive graduate program. I am extremely grateful to Dr. Mahabaduge for the care that he took to ensure that I was prepared for the next part of my academic career.

During my time as his student and working with him as a supplemental instruction leader, I have heard many times and experienced firsthand that Dr. Mahabaduge is an invested, caring, and excellent teacher.

Respectfully,  
Aidan Burlison

James Dillon Vogt  
Assistant Health Physics Specialist  
Savannah River Nuclear Solutions  
2/19/19

To the Awards Selection Committee,

I graduated from Georgia College in December of 2016 and was a student under Dr. Hasitha Mahabaduge for my final semester. Though I was only his student for one semester, the influence and impact on my academic and professional careers was monumental. Upon hearing that Dr. Mahabaduge was nominated for an Excellence in Teaching Award, I was honored to be asked to write a letter of support.

In the Fall semester of 2015, I was asked to be a part of a student panel to interview potential candidates for a new physics professor. One of the potential professors had spent some time working on solar cells, and wanting to go into the energy sector myself, I was immediately hooked on what he had to say. In addition to blowing us away at the interview and having the most interesting research proposals, he also brought an interesting teaching method. When we asked him questions, he wouldn't immediately explain to us the answer. Instead, he would ask a more basic question, use our knowledge on that answer, and then build up to the question we had just asked him. This caught us all by surprise as it juxtaposed the methods we had seen throughout the entirety of our academic careers. This was all within our first hour of meeting Dr. Mahabaduge. Already we had seen something extraordinary. He would go on to get the position and teach lower level physics classes the following semester, my final semester.

Not wanting to miss any opportunity to learn from someone who had worked with solar cells, I asked if he would teach a special topics class on Renewable Energy. Despite the work load he already had on his shoulders, he didn't hesitate from the first moment it was brought before him. In the same conversation, he was already running over potential material with me, and since it would be a one student class, was willing to share the textbook to help me even more. I had mentioned Dr. Mahabaduge's generosity to other seniors, and soon there were just under a dozen students in the class. His willingness to help one student in his interests had become an opportunity to influence everyone in the class with his teaching methods. With more students came more interests, and Dr. Mahabaduge was more than willing to indulge us.

Throughout the semester, we posed questions, and Dr. Mahabaduge would build up the foundation of knowledge that we already had before leading us to the conclusions we needed. He then took it one step further, giving us the responsibility of teaching certain subjects to the rest of the class. We created presentations in a scientific format to help our classmates understand the principles that we had spent a week researching ourselves. These presentations soon evolved as the class wanted to do something more. One student brought forth the idea of a research project: to make a solar powered golf cart for the college fleet. Another student wanted to do a presentation outside of the classroom. Never one to disappoint, Dr. Mahabaduge merged these two ideas. The solar golf cart became a cornerstone of the class, and we held an outreach day to the local elementary schools to bolster interest in science and renewable energies, teaching students what we had learned. Dr. Mahabaduge had found a science experiment that makes solar

cells out of berries and made that into something relatable the children would enjoy. It was an overwhelming success and continues to be something the college offers today.

Dr. Mahabaduge didn't stop caring for his students, even off the college campus. During the presentations, Dr. Mahabaduge saw potential within me to be a better presenter and public speaker. He approached me after class one day about looking into an organization dedicated to improving speaking and leadership skills. Once again, Dr. Mahabaduge went a step beyond and offered to drive me to the meeting, a 45-minute drive from Milledgeville to Greensboro. As a new member, I would need a mentor, someone who had been in Toastmaster's for a while, and someone who would be easy to contact and talk to. Dr. Mahabaduge stepped up immediately, and I couldn't refuse. He continued to give me a ride to Greensboro every other week, even after I had graduated, until it came time for me to leave Milledgeville. Contact didn't fall off with Dr. Mahabaduge even then, and the opportunities he allowed me continued to roll in.

Though I was only able to study under him for one semester, I have seen the impact he has had across the campus since I've been gone. The research groups he has are still strong and love what they're doing. The college still benefits from the solar golf cart and has recently increased the number of solar golf carts on campus. The elementary outreach program has gotten bigger and better each year and impacts the students as they continue into middle school and beyond. Dr. Mahabaduge takes the time and effort to make sure that each student leaves his tutelage better and brighter than when they first came to him, and in doing so doesn't just impact the student; he has had a massive impact on Georgia College and the surrounding community as a whole.

Thank you for taking the time to read this letter. To have summarized Dr. Hasitha Mahabaduge's work any shorter would have been not only a disservice to him but to Georgia College as well. There is no one I could recommend more highly for an honor like this.

Sincerely,

James Dillon Vogt

## Supporting Documents

### Student Evaluation Responses

Course (PHYS)	B. Excellent Teacher		C. Excellent Course		D. Average of B & C	
	Raw	Adj.	Raw	Adj.	Raw	Adj.
1111 Introductory Physics (Fall 2018)	4.1	4.0	3.9	3.7	4.0	3.9
4950 Thermo. (Fall 2018)	4.6	4.3	4.5	3.9	4.6	4.1
2211 Principles of Physics (Sp. 2018)	4.9	4.5	4.8	4.1	4.9	4.4
4950 Statistical Physics (Sp. 2018)	4.4	4.2	4.2	3.8	4.3	4.0
1111 Introductory Physics (Fall 2017)	4.0	4.1	3.6	3.8	3.8	3.9
2211 Principles of Physics (Fall 2017)	3.8	3.6	3.5	3.1	3.7	3.4
3100 Electricity & Mag. (Sp. 2017)	3.2	3.1	2.9	2.8	3.1	3.0
4950 Statistical Physics (Sp. 2017)	4.7	4.7	4.1	4.0	4.4	4.4

### Intentionally integrating research and library instructions into coursework

The ability to know when there is a need for information, to be able to identify, locate, evaluate, and effectively and responsibly use and share that information for the problem at hand is defined as information literacy, according to the National Forum on Information Literacy. By integrating library resources and research instruction into the course, students were prepared to position themselves at the forefront of knowledge in fields that are rapidly developing. Students learned the iterative processes of researching, creating, revising, and disseminating information, while seeking multiple perspectives during the information gathering phase. Pre and post tests on information literacy show improvements in all 6 learning outcomes of information literacy (unpublished data).



Figure 1: Pre and posttest data on information literacy for one of the upper level physics course

## Relevant Scholarship of Teaching and Learning Conference Presentations

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- Hasitha Mahabaduge, and Jeffery Dowdy, *Integrating Information Literacy into Coursework*, SoTL Commons Conference, Savannah-GA 27. (2019).
- Hasitha Mahabaduge, Karen Berman, Tsu-Ming Chiang, Kalina Manoylov, Kelly Massey, Doreen (Dee) Sams, *Undergraduate Research and Creative Endeavors: Lessons from a Professional Learning Community*, USG T&L Conference, Athens- GA (2018)
- Hasitha Mahabaduge, *Integrating Undergraduate Research into Coursework: A Project Based Approach*, International Society for the Scholarship of Teaching & Learning conference, Calgary-Alberta, Canada (2017)
- Hasitha Mahabaduge, and Jeff Dowdy, *Training the Next Generation of Renewable Energy Leaders by Integrating Research and Library Resources into Coursework*, 1<sup>st</sup> World Congress on Undergraduate Research, Doha, Qatar (2016)
- Jeff Dowdy, Hasitha Mahabaduge, Nancy Davis-Bray, *Re-integrating the library and the classroom through a "Faculty Fellows" project*, 28<sup>th</sup> GA COMO Conference, Athens- GA (2016)

## LEAP signature work and Community-based Engaged Learning (C-bEL)

Liberal Education and America's Promise (LEAP) promotes students' signature work to prepare students to complete a substantial cross-disciplinary project in a topic significant to the student and society. Most of the upper level physics courses I teach are designed with a focus on hands-on research and community-based projects. Retrofitting a solar powered golf cart is one of the classic examples of students' signature work as described in the LEAP initiative. The community-based projects for the courses are designed to let students pursue their own signature work, applying the knowledge they gained from the course. In order to prepare my students to be competent communicators, irrespective of the course, all upper level physics students who take courses with me have the opportunity to do at least one scientific presentation. If the students are enrolled in a course where we conduct the renewable energy workshop for elementary schools, they will be doing two sets of presentations. One targeting an audience with physics background and the other at the level of elementary school students. All of these presentations are peer evaluated using Toastmasters International speech evaluation criteria.

## Relevant Scholarship of Teaching and Learning Conference Presentations

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(\* indicates undergraduate student co-authors/presenters)

- Hasitha Mahabaduge, and Nick Palmer\*, *Impact of Community-based Engaged Learning as a High Impact Practice*, SoTL Commons Conference, Savannah-GA 45. (2019)
- Nick Palmer\*, and Hasitha Mahabaduge, *Community-based Engaged Learning: An Application of Renewable Energy Technology*, Bulletin of the APS, 62 (2018)
- Hasitha Mahabaduge, Nick Palmer\*, Daniel Sexton\*, and James Dillon Vogt\*, *Impact of Students' Signature Work on Employability*, USG T&L Conference, Athens- GA (2018)
- Hasitha Mahabaduge, Anderson Kendrick\*, and James Dillon Vogt\*, *Students' Signature Projects: A Qualitative Analysis*, USG T&L Conference, Athens- GA (2017)
- Hasitha Mahabaduge, *Integrating Research into the Curriculum: Creating Opportunities for Students' Signature Work*, 31st Annual National Conference on Undergraduate Research, Memphis-TN (2017)

## Mentored Undergraduate Research

Since I joined Georgia College, I maintain an active research group. My research students have presented their research at numerous conferences. I would like to highlight two of our achievements. During summer 2017, we received a highly competitive NSF-funded summer research opportunity to conduct research at the University of Nebraska – Lincoln. I conducted

research alongside my student Nowsherwan Sultan for 10 weeks. Motivated by that research experience Nowsherwan, successfully co-wrote an internal grant to secure funding for \$18,400 to purchase one of the instruments we used in Nebraska. The solar golf cart project, which started as a class project, is now a fully funded research project. Over Summer 2018, two of our undergraduate students and two high school students worked on that project. This particular project received regional and national attention and was featured on the University System of Georgia webpage as well as the National Council of Undergraduate Research webpage.

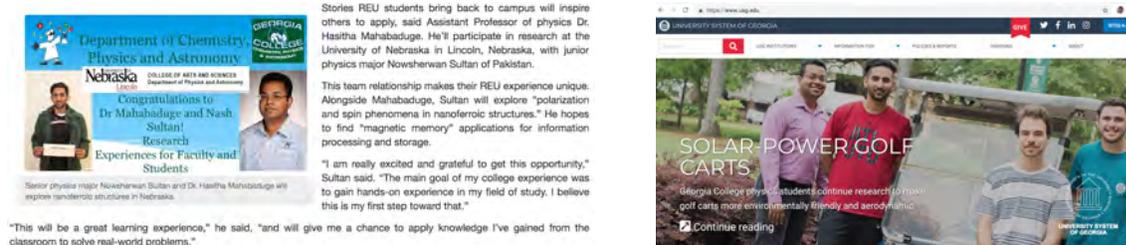


Figure 2: Two highlights of mentored undergraduate research: NSF REU, summer 2017 (top, source: frontpage.gcsu.edu) and Solar powered golf carts, summer 2018 (bottom, source: usg.edu)

## Selected Undergraduate Research Presentations

(\* indicates undergraduate students)

- Spencer Shortt\*, Aidan Bureson\*, and Hasitha Mahabuduge, *Numerical Modelling of Tandem Solar Cells*, Bulletin of the American Physical Society, 62 (2018)
- Nick Palmer\*, and Hasitha Mahabuduge, *Improving Solar Cell Materials for a Sustainable Future*, Appalachian Energy Summit, Boone – NC (2018)

### Honorable Mention Award

- Kendall McDonald\*, and Hasitha Mahabuduge, *Plasma Characterization in Magnetron Sputtering*, **Conference for Undergraduate Women in Physical Sciences**, University of Nebraska–Lincoln, (2017)
- Daniel Sexton\*, and Hasitha Mahabuduge, *Electrical and Optical Properties of Sputtered Aluminum-doped Zinc Oxide*, Bulletin of the American Physical Society, 62 (2017)
- Rylan Gordon\*, and Hasitha Mahabuduge, *Characterization of reactive magnetron sputtering plasma during thin film deposition*, Bulletin of the American Physical Society, 62 (2017)

## Beyond Georgia College...

In Baldwin County School District, Black/African American students account for 62% of the students, with White/Caucasian students accounting for 31%. We know that minorities are underrepresented in STEM fields, so projects such as renewable energy workshops for elementary school students allow them to access high-quality science education that is engaging and fun while also helping diversify the future of STEM.

Strides that are made today have the potential to leave long-lasting effects on generations to come. When I see the sparkling eyes of the elementary school students full of curiosity, awe and wonder, I feel that we are already making strides that will have a significant impact on our future generations.



Figure 3: Pictures from the recent renewable energy workshop (source: frontpage.gcsu.edu)