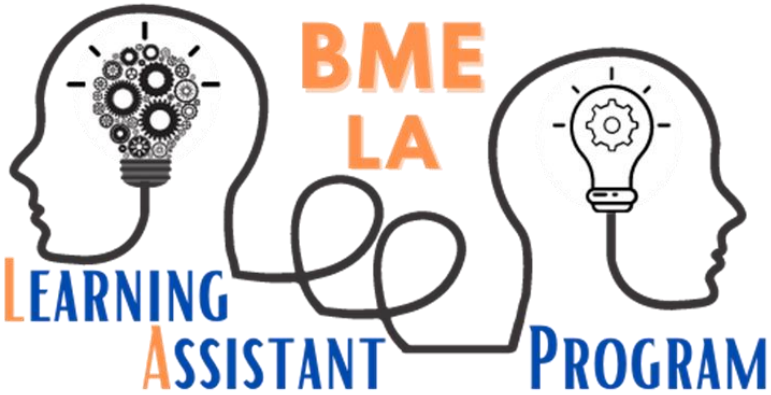
UF UNIVERSITY of FLORIDA
J. Crayton Pruitt Family Department of Biomedical Engineering

ENGINEERS for LIFE.

The BME Learning Assistant Program

HANDBOOK



J. C. PRUITT FAMILY DEPARTMENT OF BIOMEDICAL ENGINEERING | UNIVERSITY OF FLORIDA
ACADEMIC YEAR 2022-2023

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Program Summary

The Learning Assistants (LA) model is a collaborative learning strategy that aims to train undergraduate frontrunners who succeeded in a course with a strong showing to assist the next cohort of students in learning the course content. First developed at the University of Colorado Boulder and funded by the NSF, the model then expanded nationally as the Learning Assistant Alliance and was implemented in the form of department-specific LA programs in various institutions [1].

The BME Learning Assistant (BME-LA) program is an opportunity for undergraduate students to expand their personal-development portfolios as they implement multidisciplinary instructional strategies to help peers navigate a foundational BME course. The LA program also plays an instrumental role in increasing students' learning gains and retention and facilitates the transformation of traditional classrooms into collaborative, interactive, and inclusive learning environments (Figure 1). LAs are selected based on high academic standing and to reflect the diverse gender, race, and ethnic representation we have in our classrooms. Unlike TAs, LAs do not participate in the grading process. LAs also don't have access to grades and thus complement the teaching process as they form a safe, no-threat bridge between the students and the instructor, providing feedback in real-time throughout the semester. LAs must enroll in the 1-credit Special Topics pedagogy course, BME4931 Educational Methods for BME Learning Assistants (LAs).

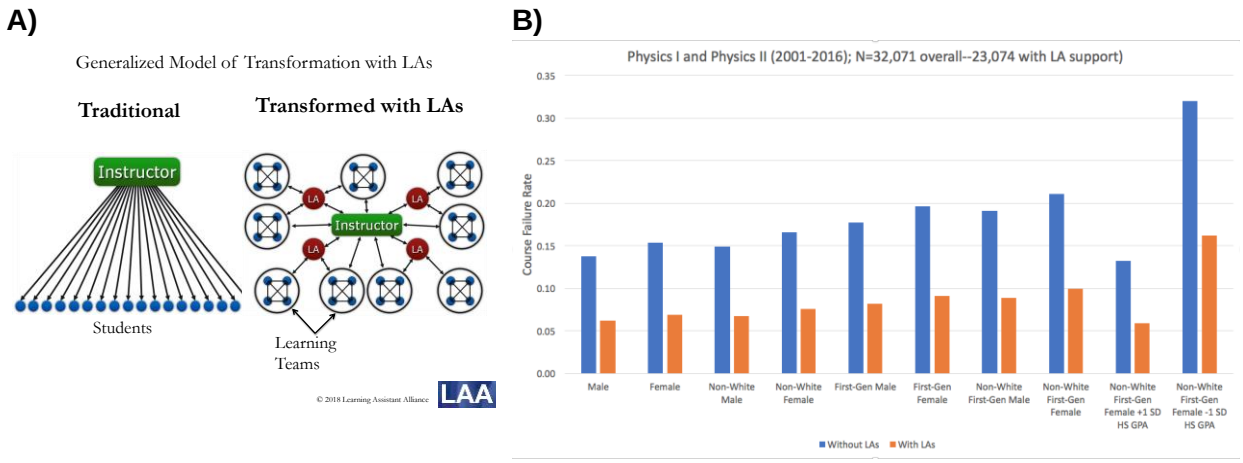

Figure 1 LA program impact on classroom relationships and student academic performance. A) Relational diagram showing effective student-instructor ratio in a traditional classroom (left) and in an LA-supported classroom (right). B) Comparison of course failure rates (D, F, and withdrawals) in an LA-supported classroom vs. a traditional classroom in the Physics department at the UC Boulder [2].

Program Goals

The program's goal is to develop LAs by coaching a cohort of undergraduate students in collaborative learning techniques. A specialized pedagogy course will teach the LAs how to improve other students' academic performance and self-efficacy using peer-led learning strategies customized for foundational BME courses and labs. The program benefits all classroom stakeholders, the students, the LAs, and the teaching team (instructor and STSs) and aims to:

1. Allow LAs to develop new learning techniques and apply them to themselves and their peers, consequently strengthening their mastery of the course and their leadership skills.
2. Acquire the art of questioning to encourage and facilitate the implementation of active learning strategies in the classroom.
3. Understand the neurological aspects of learning and leverage its power to improve learning/study habits.
4. Utilize metacognitive skills to elicit cognitive engagement and increase student motivation and retention
5. Improve student engagement by applying anti-racism and inclusivity practices in classic lecture-based settings and/or in group-based activities.
6. Implement principles of collaborative pedagogy.
7. Reduce achievement gaps and improve the overall quality of the education offered by the department.
8. Offer the opportunity to engage in engineering education research.

Program Objectives

The program relies on the synergistic collaboration of three parties: the teaching team (instructor, TA & STS), the LA, and the students. As such, each party will have a unique personal and professional experience defined by a set of objectives that can be assessed at the end of each semester[1]:

Objectives for the LA

1. Expand the LA's learning toolkit by exploring research-based pedagogical strategies, like learning theories, learning techniques and their utility, cognitive engagement, metacognition, asset vs. deficit learning models, and team formation and dynamics.
2. Transform the LA's communication skills to be more constructive and supportive by learning the art of listening and questioning and how to guide students to the answer without providing the solution.
3. Strengthen the LA's leadership skills through the apprenticeship model of the LA program and by applying different bridging techniques with the students. LAs practice the following scenario: Where do I want my students to get to and when? What do the students know/don't know now? How can we help them fill the gap and get there?
4. Learn how to identify and actively remedy forms of implicit bias and racism in the classroom and help promote diversity, equity, and inclusivity.

Objectives for the student

1. Improve academic performance by learning how to learn efficiently.
2. Lessen the burden and stress that comes with navigating new and potentially hard as well as abstract STEM material.

[1] Qualitative and/or quantitative data from these assessments can serve as seeds for uncharted engineering education research opportunities.

3. Improve the socio-emotional states of self-efficacy, STEM identity, and sense of belonging.
4. Improve communication skills by applying principles of metacognition (I know how I think. I know how my instructor/TA thinks. How do I best formulate my question to receive the answer my brain needs to consolidate the new concept?)
5. Enhance time management and communication skills.

Objectives for the teaching team (instructor and STS/TA)

1. Create the opportunity to implement and investigate new instructional strategies that rely on team-based learning (TBL) or active learning using the LAs presence in the classroom or online platforms.
2. Improve formative and summative assessments based on the feedback coming from the LAs about the classroom.
3. Assess the effect of diversity, equity, inclusivity, and anti-racism on student outcomes.

Program Elements

Pedagogy course

The pedagogy course serves as a condensed personal development training in which LAs acquire knowledge of college-level, collaborative pedagogy techniques that help them 1) learn about and recognize Kolb's learning cycle, 2) learn about metacognition, questioning techniques, and cognitive engagement, 3) learning techniques and their utility, 4) understand team formation, team dynamics, and engagement 5) learn about asset vs. deficit based models a, 6) acquire communication, inclusivity and anti-racism skills that shall increase student engagement, 7) get introduced to and possibly participate in engineering education research. The pedagogy course is a flipped classroom that meets once a week for 50 minutes to summarize reading assignments, brainstorm ideas to implement research-based learning techniques, develop classroom activities, and reflect on class dynamics. LAs must attend the pedagogy course while performing their LA duties for the first time only. At the end of the semester, LAs receive a letter grade that reflects their performance in the LA role. Students who wish to return to the LA role in a subsequent semester don't need to retake the pedagogy course.

The Pedagogy Course is a 1-credit BME Special Topics Course, BME 4931 Educational Methods for BME Learning Assistants (LAs). Students who have applied and were accepted into the LA program must contact the BME undergraduate advisor coordinator, Kelly Stalter (undergrad@bme.ufl.edu), to register for 1 -credit of BME4931.

BME LA-ready courses

BME **LA-ready** courses are BME courses whose instructors are interested in supporting their classroom or online platform with one or more LAs to improve student engagement and facilitate discussions or in-class activities. LAs will be assigned to a course based on a matching process that maps LA interest/experience to course needs. Once one or more LAs are assigned to the course, the course will be referred to as a BME **LA-supported** course. The list of BME LA-ready courses may change from one semester to another and will be available in the application form. A preview of the application form (and the list of courses) can be found at the end of this handbook.

The Application Process

Undergraduate students applying for an LA opportunity must fill out a BME LA application form to be matched to a BME LA-ready course. To make the matching process as efficient and fruitful as possible, applicants will choose **three** BME LA-ready courses that interest them and describe how they see supporting the course with an LA could improve classroom dynamics and student outcomes. Applicants will do this by writing a brief *Opportunity for Innovation/Improvement Statement (OIS)*. Opportunity Statements are the industry standard for identifying a problem and pitching a solution. The template is provided as text entry fields in the application form. This short OIS guide will help the applicants draft their OIS and focus their thoughts on what is essential.

The LA application form, available on the BME website, must be filled out and submitted no later than **June 30th, 2022.** Follow-up interviews will then be scheduled with potential candidates and selected LAs will be informed of their assignment as soon as possible. A preview of the application form is at the end of the BME LA handbook. Please note that **the application form requires a desktop device**.

The instructors of BME LA-ready courses will be notified of the availability of qualified LA(s) that could potentially facilitate classroom dynamics. When matched to one of their three choices, LAs and instructors of a given BME course will receive an email with further instructions. Assigning LAs to their first choice is not guaranteed, but we will do our best.

Weekly preparation meetings

The LAs and the teaching team of the LA-supported course hold weekly preparation meetings. The preparation meeting is ~1 hour every 1-2 weeks and serves to discuss the course of action of the upcoming week and reflect on the results of the week before. During this meeting, LAs also provide feedback to the teaching team about any classroom observations (struggling students or groups, lagging students, confused students, stressed students, common issues…etc.).

The LA

Learning assistants are undergraduate students with strong academic standing who are interested in helping their peers (other undergraduate students) navigate a foundational BME class, improving their learning/teaching practices, and honing their leadership skills.

The LA is not a TA/STS

There are always two sides in any classroom setting, the teaching side and the learning side. While the instructor, TA, and STS are on the teaching side, the LA is with the students on the learning side. The teaching team's role is to convey course content and material to the students. On the other hand, students, usually on their own, are responsible for receiving this material and learning it. Therefore, the LA will be on the students' side, confirming they received the information as intended and helping them understand it, i.e., learn. Additionally, while the teaching team performs assessments and assigns grades, the LAs are neither involved in grading nor have access to student grades. More detail about what LAs can/can't is provided in the Workload & Responsibilities section.

Eligibility:

To apply for an LA position, the applicant meet the following criteria:

1. Must be a BME major.
2. Must have taken the courses they wish to LA for with good standing within the last two semesters.
3. Must have no scheduling conflicts that would prevent them from attending their LA-ed course. If class schedule changes occur after Drop/Add week and the LA can't attend their course anymore, they will have to forgo LA duties, and a different applicant will be considered.
4. Must have a course load of <17 credit hours.

Selection criteria

LAs are recruited from the top 10% of students who have completed one or more of the foundational BME classes or labs 1-2 semesters before their LA assignment. Assignment to a specific BME LA-ready course is based on the applicant's grade in the course, their current course load for the semester, their Opportunity for Improvement Statement (OIS), and how well they followed the instructions in the application form. If more than one LA is assigned to a course, then the selected students should reflect a diverse representation. LAs may serve for more than one semester on the same course or lab, but priority is given to newly admitted LAs. Senior LAs will help train junior LAs.

Workload & Responsibilities

The workload will vary from one course to another depending on the nature of the BME LA-supported course. However, LAs are expected to work up to 10hrs a week on LA duties that are divided between the pedagogy course and the assigned BME LA-supported course, as follows:

in the Pedagogy course

LAs are expected to:

- Register for the 1-credit pedagogy course BME4931 Educational Methods for BME LAs.
- Attend and complete the assignments of BME4931.
- Brainstorm ways to implement the techniques presented in BME4931 in the BME LA-supported class they are assigned to.
- Complete the UF-FERPA training
- Complete the UF-Kognito training

in BME LA-supported course

LAs are expected to:

- Attend the BME LA-supported course to which they are assigned.
- Meet with the BME LA-supported course teaching team once a week to
    - Pitch/discuss potential class activities/assignments/ideas they acquired from the pedagogy course
    - Provide feedback about class dynamics like struggling students/groups, and common misunderstandings to the instructor.
- Perform the in-class activities and engagement strategies they discussed with the course instructor during the weekly meeting.

- Help the students navigate the course material by implementing the different learning techniques they acquire from the pedagogy course.
- Report the results of the in-class activities and other student-specific observations to the teaching team.

LAs may, but are not expected to:

- Offer review, recitation, or office hours with the students *after receiving permission from the course instructor*.
- Develop educational material like study guides, review sessions, and summaries to help the students better navigate the course material. *Any educational/instructional material developed by the LAs must be **reviewed** and **approved** by the course instructor before dissemination to the students.*
- Provide feedback on the delivery of the course material to the instructor.
- Provide feedback on problem statements and assignment design to the instructor.

LAs are not expected to/not allowed to:

- Share the answers for any assignment (quiz, HW, test,..etc.) with the students.
- Share instructional/educational material with the students without consulting the instructor.
- Have access to Test/Exam material.
- Grade any student assignments.
- Have access to the grade book.
- Discuss grading issues with the students.

Expectations from Instructors:

Pedagogy course instructor:

- Receive weekly or biweekly reading/reflection assignments.
- Discuss the weekly assignment and brainstorm/plan possible activities.
- Receive guidance on reported classroom issues.
- Receive guidance on how to handle challenging situations with struggling or anxious students.

BME LA-supported course instructor:

- Meet weekly to plan the LA's role in the classroom.
- Review of any material the LA has developed to help the students (study guides, review session material, material summary, ... etc.).
- Receive guidance on reported classroom issues.
- Receive guidance on how to handle challenging situations with struggling or anxious students.

At any time, if you are unsure of an assigned task or responsibility, please contact Dr. Mansy (mmansy@bme.ufl.edu) for clarification immediately.

The Instructor

Instructors interested in incorporating active and collaborative learning techniques in their classroom or who wish to achieve any of the previously mentioned LA Program goals may request to transform their class from a traditional classroom to an LA-supported classroom. Please email Dr. Mansy (mmansy@bme.ufl.edu) to add your course to the BME LA-ready course list.

Selection criteria

While the LA program is most suitable for high-enrollment foundational BME courses and labs, instructors of any BME course may support their course with one or more LAs. Instructors will be informed if a suitable match is found. It can be challenging to find LAs for senior-level courses as former students would have already graduated from the program.

Workload & Responsibilities:

Instructors of LA-supported classes benefit tremendously from having an LA. LAs will come in trained and prepared with learning techniques and activities that they have acquired in the pedagogy course. Since LAs were selected and matched to the course because they took this course before, their input will be course-specific and ready for implementation, with little to no input from the course instructor. However, instructors of LA-supported classes are expected to meet with the LAs on a weekly or bi-weekly basis to discuss the plan (activities, techniques, ...etc.) for the upcoming week and reflect on the results of the week before.

BME LA-supported course instructors are expected to:

- Introduce the LAs to the students and emphasize that LAs will not provide direct answers but rather guide and help the students reach the answer on their own.
- Communicate how the LA role differs from the TA role. More information about the difference between an LA and a TA is in the "The LA is not a TA" section.
- Establish LA respect and appreciation in the classroom.
- Meet with the LAs on a weekly or biweekly basis to communicate with the LAs and agree on their role in the classroom.
- As much as possible, be supportive of and open to the ideas LAs bring in from the pedagogy course to allow/facilitate the LA experience in the classroom and reap its benefits.
- If the LA has created instructional material to help the students better navigate the course material (study guides, review session material, material summary,.. etc.), then the content has to be reviewed for correctness.
- Provide guidance on reported classroom issues.
- Provide guidance on how to handle challenging situations with struggling or anxious students.

At any time, if you are unsure of a task or role assignment, please don't hesitate to contact Dr. Mansy (mmansy@bme.ufl.edu) for clarification.

Reference

[1] Learning assistance alliance: https://learningassistantalliance.org

[2] UC Boulder resources website: https://sites.google.com/view/laa-resources/home

BME LA Application Form Preview - Fall 2022

Welcome to the BME Learning Assistant application form!

My name is Dr. Mansy, I'm the Director of the LA program and I'm very happy you are considering becoming a Learning Assistant (LA) for one of our BME courses or labs.

The application form has four parts and will require some preparation. Therefore, please allocate at least 45 minutes to complete the application in one sitting. Alternatively, you may close the form and return to it at any later time as long as you use the same browser and desktop device. The application form requires a desktop device. In Part 1, you will tell us a bit about what motivated you to become an LA. Part 2 will help determine workload and assignment feasibility. It would be a good idea to have your Fall 2022 course schedule accessible for Part 2. Part 3 is the application's core and will gather data that will guide the matching process, i.e., the process of assigning an LA to a BME LA-supported course. To make the matching process as efficient and fruitful as possible, Part 3 will also require you to share some personal perspectives and ideas about the BME LA-supported courses that interest you. You will do this by writing a brief Opportunity for Innovation/Improvement Statement (OIS). Opportunity Statements are the industry standard to identify a problem and pitch a solution. The provided template (text entry fields in this survey) will help you focus your thoughts on what is essential and facilitate the matching process. Please read this brief guide for some quick tips about how to write an efficient OIS. You may submit 2 OISs per course while maintaining a word limit of 200 words for each part of the OIS (see guide for more info). Here, too, having your Fall 2022 course schedule handy will inform your course selection process. Last but not least, Part 4 will request standard demographic information - all of it being optional. Feel free to skip it if you don't feel comfortable sharing this kind of information. A full preview of this application form is available in the BME LA handbook.
So, let's get started! Please provide your full name and your UF email address.

What is your name?

- ○ First Name _____
- ○ Last Name _____
- ○ UF- email address _____

Part 1 | Interest & Experience

Hi! Tell us a bit about yourself and why you are here.
Why are you interested in serving as an LA? [write 1-2 sentences]
Please don't mention particular courses or problems here. Focus on your interest only.

_____

_____

_____

What qualities do you think would make you a good LA? [write a bullet list]
Focus on your academic and soft skills, don't mention GPA or grades.

_____

_____

_____

What are you looking to get out of the LA experience? [write a bullet list]

_____

_____

_____

Do you have previous experience with other LA programs?

- ○ Yes, I served as an LA with a different department.
- ○ Yes, I attended an LA-supported class in a different department.
- ○ No, I don't have previous LA experience.

What is the name of the LA-supported class you attended?

_____

Have you taken a pedagogy course before?

- ○ Yes
- ○ No

Select the pedagogy course(s) you have taken.

- ☐ BOT4935/ZOO4926 (Biology department)
- ☐ PHY4905 (Physics department)
- ☐ EGS6065 (Engineering Education department)
- ☐ other, please specify _____

OK! We are done with Part 1 of the application. Let's move on to Part 2 and assess your academic bandwidth.

Part 2 | Workload & Feasibility

As outlined in the BME-LA handbook, all LAs must enroll in a **1-credit** Special Topics Pedagogy course, *BME4931 Educational Methods for BME LAs*. LAs are also expected to attend the BME-LA supported class and meet ~1hr per week with the course instructor, accounting to an estimated workload of ~10hrs per week. ****If you have taken the Pedagogy Course in Spring 2022, then you don't need to re-take it****. Based on that,

How many credits are you enrolled in in Fall2022?

▼ less than 12 ... 15 < credits

How many hours per week can you dedicate to LA-ing?

▼ less than 4 hrs ... more than 10 hrs

Will the Special Topics Pedagogy course, *BME4931 Educational Methods for BME LAs*, that meets Friday at 4:05-4:55pm in JG32 fit in your schedule? [* You will have to drop BME4931 if you can't attend due to a scheduling conflict, after Drop/Add week.]

- ○ Yes
- ○ No

Now that we know a bit about your fall schedule, let's move on to Part 3 and see if we can match your skills to one of our BME LA-supported courses.

Part 3 | The Matching Process

Provided is a list of BME courses that are participating in the BME LA program in Fall 2022. Please drag and drop the course numbers to rank the courses such that the top 3 would be the ones you feel most confident about, and that would **not conflict with your Fall 2022 course schedule.**

You must attend the course you want to LA. If you end up having a scheduling conflict after Drop/Add week, then you will have to forgo the LA role for the term.

BME4503L is a special case as it meets 3 times for 3 hours per week. If it is one of your choices, then please indicate at the end of the survey which section(s) (T, W, or R) you are interested in.

BME3053C	Computer Applications for BMEs	T 1:55 - 4:55pm
BME3060	Biomedical Fundamentals	T 3:00 - 4:55pm & R 4:05 - 4:55pm
BME3012	Clinically-Inspired Engineering Design	T 3:00 - 4:55pm & R 4:05 - 4:55pm
BME4503L	Biomedical Instrumentation Lab	TWR 9:35am - 12:35pm
BME4531	Medical Imaging	T 11:45am - 1:40pm & R 12:50am - 1:40pm
BME4503	Biomedical Instrumentation	MWF 8:30 - 9:20am
BME3508	Biomedical Signals and Systems	MWF 1:55 -2:45pm
BME4409	Quantitative Physiology	MWF 9:35-10-25am

BME4632	Biomedical Transport Phenomena	MWF 11:45am - 12:35pm

_____ BME3053C
_____ BME3060
_____ BME3012
_____ BME4503L
_____ BME4531
_____ BME4503
_____ BME3508
_____ BME4409
_____ BME4632

For the top 3 courses you selected in the previous question, when did you complete each course, and what grade did you achieve?

	Choice 1	Choice 2	Choice 3
Term of completion (eg. Fall 2021)			
Grade (e.g.: A, 92.5%)			

Now it is time to share your thoughts/ideas. Tell us why you think the courses you chose would benefit from being LA-ed by writing an Opportunity for Innovation/Improvement Statement (OIS). **Please read this brief guide for some quick tips about how to write an efficient OIS**. As shown in the guide, the template will help you focus your thoughts on what is essential and inform the matching process. **You will fill out the template three times; one time for each of your top 3 choices.** Start by selecting your top choice from the drop-down menu, then fill out the OIS text boxes on the next page. Hit the next button to select your second choice and write its OIS. Repeat for your third choice.

This Opportunity for Innovation/Improvement Statement (OIS) is for

▼ choice1, choice 2, or choice 3

The current problem in *choice 1* is...
Your word count is 0/200(max)

The effect of this current problem on the students is …
Your word count is 0/200(max)

The suggested solution is …
Your word count is 0/200(max)

The effect of the suggested solution on the students is ….
Your word count is 0/200(max)

_____

_____

Please indicate if there another issue about *choice 1* that you would like to share.

- ○ Yes, I want to submit a second OIS for *choice 1.*
- ○ No, I'm done. Let's move on to *choice 2*.

[The OIS template will be repeated for *choice 2* and *choice 3* in the actual application form]

Part 4 | Demographic data
We are almost done! The next couple of questions are optional. We understand if you prefer to skip this part, and it will not affect your application.

Please write the term(s) that you choose to describe your racial or ethnic identity.
optional

_____

Please write the term(s) that you choose to describe your academic identity (Scientist, engineer, first generation student, transfer student, Florida resident, international student,..etc.)
optional

_____

Do you identify as any of the following? Select all that apply.
optional

- ☐ Asian
- ☐ Black
- ☐ Hispanic/Latinx
- ☐ Middle Eastern
- ☐ Native American/Alaskan Native
- ☐ Native Hawaiian/Pacific Islander
- ☐ White
- ☐ None of the Above _____

Please leave any additional information that you would like us to know in the space provided below. optional

_____