



2018

Starting an EMBS Club or Chapter

*A Resource for
EMBS Volunteers*



EMBS Student Activities Committee
2018

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1 What is EMBS?

EMBS is the Engineering in Medicine and Biology Society, which is the largest international membership society in the world devoted to bioengineering. It is one of 40 Societies and Councils within the Institute of Electrical and Electronics Engineers (IEEE) . Our members have an interest in biomedical engineering, and range from medical doctors and clinical engineers to physicists and students.

1.1 Mission

The IEEE EMBS advances the application of engineering sciences and technology to medicine and biology, promotes the profession, and provides global leadership for the benefit of its members and humanity by disseminating knowledge, setting standards, fostering professional development, and recognizing excellence.

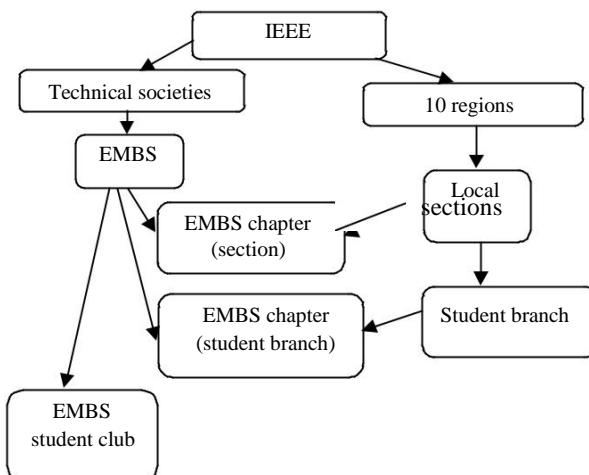
1.2 Field of Interest

The field of interest of the IEEE EMBS is the application of the concepts and methods of the physical and engineering sciences in biology and medicine. This covers a very broad spectrum ranging from formalized mathematical theory through experimental science and technological development to practical clinical applications. It includes support of scientific, technological, and educational activities.

1.3 Organization of EMBS

EMBS is a technical society of the IEEE. A technical society is basically a group of people interested in the same technical field. While EMBS is a technical society of IEEE, our interests encompass more than electrical engineering as applied to biomedical problems. For example, two of our journals are *IEEE Transactions on Neural Systems and Rehabilitation Engineering* and *IEEE Transactions on NanoBioscience*.

The following “flowchart” description of IEEE and EMBS explains how the two groups are organized, and how the IEEE and EMBS interact. This may be useful for organizing your club or chapter, as you may be able to tap into existing groups at or near your school.



IEEE organizes its members geographically. The IEEE world is divided in 10 regions: 6 in the USA; and one each in Canada; Europe, Middle East, and Africa; Latin America; and Asia and

Pacific. Each region has local sections, which are groups of IEEE members who live fairly close to one another. For example, the region of Canada has a Vancouver section, a Toronto section, a Southern Alberta section, and more. Sections generally have regular meetings, and may hold events (e.g. speakers, conferences). Sections may include local universities, colleges and technical institutes. There may be a student branch (group of student IEEE members) at a school or schools in the section. The student branch is part of the section; however students may organize their own events and activities independently of the section.

In the past, EMBS has followed the IEEE structure with 10 regions. In 2003, EMBS was reorganized into five geographical zones that replaced the 10 IEEE regions as follows:

- *North America*
- *Europe*
- *Middle East & Africa*
- *Latin America*
- *Asia-Pacific*

An EMBS chapter may still be part of a local IEEE section. A chapter is a technical interest group of a section, and consists of at least 12 EMBS student members. The EMBS chapter may organize events that interest its members, such as a speaker on biomedical engineering. For students, EMBS has two groups. An EMBS student chapter has at least 12 EMBS student members. An EMBS student club requires only one EMBS member, as EMBS recognises that it may be difficult for some schools to have 12 EMBS student members. The EMBS member may be a student or faculty advisor.

1.4 EMBS activities

In addition to supporting local groups interested in biomedical engineering, EMBS is involved in technical information. Every member receives the EMB magazine, which surveys hot topics in biomedical engineering. EMBS has a number of technical journals, including:

- *IEEE Transactions on Biomedical Engineering*
- *IEEE Transactions on Medical Imaging*
- *IEEE Transactions on Neural Systems and Rehabilitation Engineering*
- *IEEE Transactions on Information Technology in Biomedicine*
- *IEEE Transactions on NanoBioscience*

EMBS conferences include an annual international conference, special topic conferences, summer schools, and regional conferences. You'll find more information on all of these activities at <https://www.embs.org/conferences-meetings/>.

1.5 Your representatives to EMBS

EMBS is directed by an Administrative Committee (AdCom). The committee consists of elected representatives from each zone, a student elected by all student members, several at-large members, and an executive committee that oversees membership, conferences, publications, and finance. More details on the members of AdCom and various committees are available at <https://www.embs.org/about-embs/organization/embs-officers/>.

For organizing student clubs and chapters, it is helpful to identify the AdCom representative responsible for your region, and the student representative. These people can help you to start your club, perhaps by emailing all EMBS members in your city to let them know about your first meeting. These representatives report to the Vice President of Membership and Student

Activities. If you identify a membership concern, VP Membership and Student Activities or representatives may present it to AdCom. For example, the VP Membership and Student Activities has worked to address the high cost of membership for students in developing countries.

Another important person to know is the Chair of Student Activities (check on <https://www.embs.org/about-embs/organization/embs-officers/> and look up Steven Wright, VP, Member & Student Activities, 2016-2017 to find out the contact information). The contact information for the EMBS executive office is also found on the web page (you send forms, expense claims, etc. to the EMBS office). The EMBS executive office is staffed by Laura Wolf and Jodi Strock. They are extremely helpful and knowledgeable about EMBS! To view all staff members of the executive office, visit <https://www.embs.org/about-embs/organization/executive-office/>.

1.6 What are the benefits of joining EMBS for students?

You will be part of a professional organization for biomedical engineers.

For most individuals the rapid changes in biomedical engineering are difficult to keep up with. Almost daily, exciting advances are reported in the media about the artificial heart, pacemakers, medical imaging techniques, lasers, prosthetic implants, life support systems, surgical robots, and devices that help the paralyzed walk. To be a successful biomedical engineer, it is important to be familiar with these advances. One way to be aware of the latest changes in biomedical engineering is to belong to a professional biomedical engineering society.

It is important for students to be a part of a professional organization. First of all, the information available to you in our publications will help increase your awareness of opportunities biomedical engineering provides before and after graduation. Second, you will build your network by meeting biomedical engineering students at other universities at conferences and club or chapter activities. Additionally, you will have the opportunity to interact with internationally recognized researchers through publications, conferences and meetings, and clubs and chapters.

EMB publications

The EMB magazine covers current topics in biomedical engineering. You will receive 6 issues per year with your student membership. As an EMBS student member, you will also have free access to our IEEE Transactions online through IEEExplore (<http://www.ieeexplore.ieee.org>).

EMBS student activities

Student paper contest: Student paper contests are held as part of our annual conferences. This is a great opportunity to present your work at a conference, and perhaps win prizes!

Student events at conferences: Our annual conferences on biomedical engineering provide you with the opportunity to present your research to the biomedical engineering community and meet other biomedical engineers. You will receive discounted registration with your EMB student membership, and will be invited to attend student events where you will get to know your future colleagues.

EMBS summer school: This is a wonderful opportunity to learn about topics in biomedical engineering from world experts. Summer schools are a week long, and include lectures,

speakers, and the opportunity to discuss your research in detail. There are 4 summer schools on topics including biomedical imaging, biocomplexity, medical devices and biosensors, and applications of ICT in biomedicine. More information may be found at <https://www.embs.org/conferences-meetings/summer-schools/>.

Support for your projects: Have you thought about starting up a network of biomedical engineering students at nearby universities? Or maybe starting an online journal for students? Through your EMBS club or chapter, funding is available for your projects (up to \$1000 USD in matching funds).

Distinguished lecturers program: Would you like to invite a world-recognized expert in biomedical engineering to speak at your school? We have a program set up to help you do this! Check for a list of lecturers and funding information at <https://www.embs.org/about-embs/awards-recognition/distinguished-lecturers-program/distinguished-lecturers/>

Clubs and chapters: You can start an EMBS club at your school with only 1 EMBS member (student or faculty advisor). Your club will receive many resources on biomedical engineering, and can apply for funding to support your events (up to \$500 USD in matching funds). You may also start an EMBS chapter (the details of which can be found further in the document) which allows for up to \$1000 USD in matching funds. These funds are matched in a 2:1 ratio from the IEEE EMBS funding center (A club may only raise a maximum of \$250 before obtaining \$500, whereas chapters can raise up to \$500 and have matched funding up to \$1000). Details on how to obtain matched funding can be found further in the document. For more information, go to <http://students.embs.org/clubs-chapters/funding/>

Fun projects that get everyone to work as a team: A mutual goal of helping others will help knit your fledgling EMBS club or chapter into a solid team bonded in friendship. Outreach efforts through exciting presentations to high schools have been very successful for some clubs. Other clubs have formed groups for research, or have given presentations about bioengineering to introductory freshman engineering classes. Still other groups have proposed activities such as organizing clothing/shoe drives for Albanians and Afghanis, simultaneously forming links with Doctors without Borders and other similar groups to provide transportation for the donations. Examples of programs run by student clubs and chapters are given in three papers at the end of this document: **Promoting Engineering through Recruitment; Student Leadership: Biomedical Engineering Initiatives at Carleton University; and BME Education Programs at an EMBS Student Club.** Each paper was presented at an EMBS Annual Conference.

Awards: Engineering in Medicine and Biology Society offers awards for EMBS student clubs and chapters demonstrating outstanding performance in promoting interest and involvement in biomedical engineering. One EMBS student club/chapter will be recognized annually with an Outstanding Performance Awards and a monetary award of \$ 300 USD. In addition, financial support will be provided for one representative of the winning club/chapter to attend the EMBS annual conference to give a talk about the group's activities. This club/chapter will also be featured in the EMBS Magazine.

1.7 Cost of membership

EMBS student members must be IEEE student members. For 2017, the IEEE student membership fee for year-long subscriptions is \$32, \$33.60, \$36.80, \$36.16, \$36.79 and \$27 USD for students in the United States of America, Canada (where GST is applicable), Canada (where HST for NB, NF, NS and PEI are applicable) Canada (where HST for ON is applicable), Canada (where GST and QST Quebec are applicable), and outside the USA and Canada altogether,

respectively (Pricing effective 16th August 2017 to 15th August 2018). EMBS student memberships are \$10 USD in addition to the IEEE fee described above.

Students also have the option in enrolling in half-year memberships for both IEEE student member subscriptions as well as technical society membership subscriptions. These half-year memberships cost half as much as the year-long memberships and last half as long. For instance, a United States resident applying for a full-year subscription to IEEE EMBS would have to pay \$32 for the year-long IEEE membership as well as \$10 for the year-long EMBS membership, totaling \$42. If, however, the student only wanted six months of membership, the prices would become \$16, \$5, and \$21, respectively.

Note that half-year rates apply to new members only. For more information, call +1-800-678-4333 (US & Canada) or +1-732-981-0060 (Worldwide).

You may join EMBS online when renewing your IEEE membership. You may join at any time by completing the EMBS student membership application (available in Section 6: Electronic Resources, or through the EMBS website) and sending it to EMBS.

2 What are EMBS clubs and chapters?

EMBS supports two completely separate student organizations for biomedical engineering students. The Student Branch Chapter requires at least 12 student members of both IEEE and EMBS. Although chapters are separate from IEEE student branches, they are usually associated with a student branch. A Student Club is a more informal EMBS organization. The club does not need to be affiliated with an IEEE student branch and only requires one person (student or advisor) to be an EMBS member.

2.1 Chapters

An IEEE-EMBS Student Branch Chapter (SBC) is a completely separate student organization from the local university IEEE Student Branch Chapter. For example, the IEEE-EMBS Student Branch Chapter has its own elected officers and an approved IEEE constitution. To form an SBC, a university must have at least twelve IEEE student members who are also EMBS members, complete the application materials, and draft a constitution. The petition and sample constitution are included in the electronic resources at the end of this guide. The official IEEE requirements for establishing a student branch chapter are summarized below.

REQUIREMENTS FOR ESTABLISHING A STUDENT BRANCH CHAPTER OF AN IEEE TECHNICAL SOCIETY

- A petition, signed by not less than twelve (12) Student Branch members, who are members of the technical Society, must be submitted to IEEE Student Services
- The petition must specify the name of the Student Branch, the name of the technical Society with which the Student Branch Chapter will be affiliated, the name of the interim Branch Chapter Chair and the name of the Faculty Advisor, who must also be a member of IEEE and the technical Society
- After the Advisor and the Student Branch Executive Committee have approved the petition, it should be mailed to IEEE Student Services
- Upon receipt of the petition, Student Services staff will verify the membership of the individuals who signed the petition. If the petition is in order, staff will take the necessary

action to obtain formal approval of the petition by the Society President, the Regional Director and the Regional Student Activities Committee Chair

- Send completed petition to:

IEEE Student Services
445 Hoes Lane/PO Box 1331
Piscataway, NJ 08855-1331
Fax: 732-463-3657

Each May 1, the SBC is required to submit an annual activities report and a financial statement. Additionally, the SBC must report the result of the officer elections to IEEE Student Services each year, no later than one month after the election.

2.2 Clubs

The EMBS Student Club is designed for a university that does not have a sufficient number of EMBS student members to form a student branch chapter (SBC). There are no minimum student number requirements, but at least one person (advisor or student) must be an EMBS member. To form a Student Club, a one page Petition for the Establishment of an EMBS Student Club application form is completed by the students and their advisor, and submitted to the EMBS Chair for Student Activities for approval. Once approved, the Student Club exists for the current academic year. To continue as a Student Club, the students must resubmit an application on a yearly basis. This application form can be found as an electronic resource at the end of this guide.

2.3 Why start a club or chapter?

Both clubs and chapters are groups of students interested in biomedical engineering, and offer students an opportunity to learn more about the field of biomedical engineering. Forming a club or chapters gives you access to resources on biomedical engineering. With receipt of the required paperwork, the Student Club receives a free academic year subscription to all of the EMBS publications. The Student Club allows EMBS to enhance the education of the biomedical engineering student by providing publications about biomedical engineering. The EMB Magazine provides tutorials and review articles on topics that are not usually covered in the classroom, conference dates, and BME employment opportunities. These publications give students a glimpse of the world awaiting them after graduation. Your club or chapter may also apply for matching funding to support activities such as a guest speaker or industry tour.

2.4 Questions about starting EMBS chapters and clubs

Q. We already have a BMES student club. Is it ok to form an EMBS student club? What is the benefit of doing this?

A. While we are interested in increasing the number of EMBS student chapters and clubs (SBCs), we are not interested in competing with other professional societies by forming an SBC at a university that already has a professional student society, such as the Biomedical Engineering Society (BMES) Student Chapter. In universities that have a BMES Student Chapter, the EMBS would like to form a Student Club so that we can provide free EMBS publications to enhance the students' education. The Student Club is completely compatible with the BMES Student Club. The students do not have to file any additional paperwork throughout the year or even hold separate meetings. The Student Club is simply a mechanism to provide all of the EMBS publications to every interested group of students in the world. Of course, it is appropriate to be a student member of both BMES and EMBS.

Q. How do I start an EMBS club? How do I start an EMBS chapter?

A. A detailed account of how to start an EMBS club or chapter follows in Section 3.

3 Starting an EMBS club or chapter

So you've decided to start an EMBS student club or chapter! What do you do next? The suggested steps will hopefully get you going. Add your own experiences to the list! Please email the student representative (emb_student@ieee.org) with your feedback, so we can incorporate it in the next edition of this guide.

3.1 Step 1: Finding other EMBS members and/or Interested Students

Are there any other EMBS members in your area? Before you try to set up a club/chapter, it is best to find out what's already out there and the level of interest. Here are a few places to check:

- **Your local section:** There may be a non-student EMBS chapter affiliated with your local EMBS section. Providing your club members the opportunity to connect with working biomedical engineers is a huge benefit. To find your local section, visit the IEEE web page (<http://www.ieee.org>). Click on local activities, and find yourself on the clickable map. For example, we'll find local activity in Calgary, Alberta, Canada. Click on region 7 on the global map, then Southern Alberta on the map of region 7. We arrive at the Southern Alberta section web page. EMBS doesn't appear on the main page, but when surfing through the executive list, we notice a member responsible for EMBS. If this does not work, one may also use the following link, and scroll down to "Find a Section, Chapter, or Affinity Group," and search amongst the links posted there as one finds necessary:
https://www.ieee.org/societies_communities/geo_activities/units/index.html#sect1
- **Your local IEEE student branch:** To find your local student branch, go to the IEEE web page (<http://www.ieee.org>), and click on students. There is a branch list in the menu on the upper left of the page. Select your region, and you'll see a list of student branches sorted by region. For example, the Southern Alberta section lists 3 student branches at U of Calgary, DeVry and SAIT. EMBS clubs are a great way to get students interested in biomedical engineering involved in IEEE student branches. You many want to contact all student branches in your region and find out if they have an active EMBS club or chapter. If not, students from those branches may want to participate in your club. If other EMBS clubs exist in your region, this gives you the opportunity to organize events together. When starting a club at U of Calgary, we found out that DeVry had an active EMBS club. We plan to organize a technical speaker night together, and invite biomedical engineers to give our students the opportunity to network.
- **EMBS clubs and chapters:** There is a list of student clubs and chapters on the EMBS web page (<https://www.embs.org/member-communities/chapters/>). You may find other clubs and chapters near you, visit web pages of other clubs and chapters to get ideas for activities, or email other clubs and chapters to ask for more details about their events. For more information, also visit <http://students.embs.org/clubs-chapters/>
- **EMBS student representative:** The EMBS student representative has access to a database of all EMBS members. If you'd like to make sure that all EMBS student members living in your city have been invited to your first meeting, email the EMBS student representative an announcement of your meeting and the rep can distribute it to student members in your area.

- ***Other groups on campus:*** Identify other groups on campus with similar interests, and ask them to advertise your meetings to their membership. This may lead to co-organized activities in the future. Some schools have pre-medical or pre-dental clubs. This group may be interested in co-hosting a speaker on writing the MCAT. Many schools have active women in science and engineering (WISE) groups. You may want to work on projects together. For example, EMBS has produced a video on biomedical engineering suitable for high school students. If the WISE group on your campus has a high school outreach, your club could participate by talking about biomedical engineering and showing the EMBS video.
- ***Faculty:*** The Dean, academic and administrative members of your faculty may be aware of IEEE clubs or chapters already in existence in your university/college. They may also be aware of similar groups within the University that you may contact. Contacting the Dean's Office with a general inquiry may be a good start to your search.

3.2 Step 2: Your first meeting

Once you know the interest is there, the next step is deciding where and when you'll have your first meeting. You may need to book a room, and check class schedules to ensure that as many interested people as possible can attend. To help with advertising your meeting, sample posters and emails are included on the electronic resources. Many departments have email lists that reach all undergraduate or graduate students. You might want to ask about these lists, as it may be possible to send out an email advertising your first event.

Before your meeting, it is a good idea to plan what you'd like to accomplish. For example, you may want to:

- Explain what bioengineering is about (the brochure on bioengineering available through the EMBS website might help here).
- Show demos of interesting projects, which can always help spark students' interest.
- Introduce EMBS clubs and explain why you want to start a club (benefits to students).
- Find out the needs of your potential members and the activities that interest them.
- Complete the application to form a club.
- Recruit volunteers to help you organize future events (see Section 5 for suggestions about executive committees).
- Provide snacks and beverages at the meeting—they're always a good idea.

If you have some EMBS magazines and journals, you might want to bring them along to show other students.

The electronic resources include the following files:

- PowerPoint presentation that outlines EMBS clubs or chapters,
- Sample survey that collects contact information and indicates the interests of people attending the meeting,
- EMBS club application form.

If you have a suggestion for an upcoming event and list of tasks that need completing to make this event happen, then this provides your members with an opportunity to get involved. They will feel part of an exciting and active club! For suggestions for events, please see Section 4 of this guide.

3.3 Step 3: The paperwork

To register your club with EMBS, please fill in the **Petition to Establish an EMBS Club**. This is available online at <http://students.embs.org/clubs-chapters/student-club-petition/>, and should be submitted to the EMBS Executive Office.

For more information on establishing your chapter with IEEE and EMBS, please visit <http://students.embs.org/clubs-chapters/new/>.

3.4 Step 4: Communicating with your club members

One easy way to communicate with your club members is through email. It is a good idea to collect email addresses at your first meeting, so you can start sending announcements to your new club members. This is a great way to advertise your club meetings. The creation, distribution, and public display of posters is another way to invite new members to join you, and to remind your members of upcoming meetings and events.

A club or chapter website is useful for letting your members know about upcoming club events, or other seminars, talks or tours of interest. You may also wish to provide a link to the EMBS industry database to help your members identify job opportunities. The website is also a way to let other groups on campus or in the community with similar groups know how to contact you.

4 Events

4.1 Ideas for EMBS Club or Chapter Events

Tours: Your club may be interested in touring a local company. There is a list of companies on the EMBS website (<https://www.embs.org/member-communities/industry-partners/>). If the list doesn't contain any companies in your area, you may want to ask the student rep to send an email requesting tour ideas to EMBS members in your area. Your local hospital is another interesting place to visit, as it may have a clinical engineering or radiology department. Finally, professors within your biomedical engineering department may be willing to give tours of their labs given enough details and event planning. This is an excellent way to get new members interested in research.

Conferences: Your club members may be interested in attending the EMBS annual conference, and your club could organize fundraising to assist with travel costs. You may request that members attending the conference give a talk to your club or chapter on their experiences. Several clubs and chapters organize their own conferences, including design competitions, speakers, presentations of student research, and local tours. Your local IEEE student branch may be interested in putting on an S-PAC (student professional awareness conference), and your club or chapter could organize a session on biomedical engineering as part of the S-PAC. For a full list of upcoming EMBS conferences, visit <https://www.embs.org/calendar/embs/>.

Speakers: Invite graduate students, postdocs, or professors doing biomedical research to give a talk to your club. Invite world-recognized experts to visit with the EMBS Distinguished Lecturers program (see - for details). Your local section, EMBS chapter or department may be interested in inviting a Distinguished Lecturer with your club. You may also wish to talk to the career services group at your university—they are often very keen on helping out with organizing events that give information about careers.

Outreach to high schools: EMBS has produced a career video on biomedical engineering that is suitable for high school students. This makes visiting high schools much easier for your club members, as the video provides an introduction to and overview of biomedical engineering. The

video can be ordered from EMBS. There is also a Massive Open Online Course, or MOOC, offered by edX that talks about many aspects of bioengineering, from the breadth of the field to how a high school student would start to chart their own career. The link to that website can be found here: <https://www.edx.org/course/so-you-want-become-biomedical-engineer-ieeeex-biomed01x-1>. There are also a collection of excellent Youtube videos posted on the IEEE EMBS Students Website home page that can be found at <http://students.embs.org/>.

Projects: Your club members may have ideas for projects. The UNB EMBS club put together an online Journal of Biomedical Engineering Concepts. You may want to put a team together for a charity event such as Run for the Cure. Your local children's hospital may have a wish-list of projects that are perfect for teams of engineering students. With proper coordination, it may be possible to have these projects funded in part by EMBS. C

Summer Schools: Your club members may have an interest in attending summer schools, both to complete coursework prior to the Fall and Spring semesters, or to travel abroad. EMBS organizes and hosts summer schools on a range of topics, in a variety of different locations. In 2017, the courses offered included, but were not limited to, computer modeling in Charleston, SC, USA, neural engineering in Shanghai, China, and biomedical imaging in Saint Jacut de la Mer, Emerald Coast, France. For listings and more information, visit <https://www.embs.org/conferences-meetings/summer-schools/>.

Mentorship Programs: Mentorship programs are an excellent way to get involved with professionals around the world that can provide valuable career guidance and advice, as well as contribute to the professional and personal development of your student members by developing business contacts, obtaining access to industry information and activities, and gaining valuable insights from experienced and successful professionals. For more information, visit <https://www.embs.org/member-communities/mentor-connection/>

Student Paper Competition: The student paper competition is a fantastic way to both encourage undergraduate research and also reward students with the best papers. The student paper competition only requires that six papers be drafted, from which a sort of “conference” is held, where the research is presented before student members, faculty, and other students. The author(s) of the paper(s) which a panel of judges votes to be the most exceptional will be awarded a stipend to travel to the EMBS conference in the upcoming summer of that year. The 2017 EMBS conference took place in Jeju Island, South Korea, and the 2018 EMBS conference will be taking place in Honolulu, Hawaii.

4.2 Example: Successful EMBS Club Event

The following description of a successful EMBS club event is courtesy of Dr. Christopher James and Andreas Pohlmann. The description appeared as an article in the EMB Magazine Student's Corner, November/December 2001 issue:

UK & RI EMB Student Section organise first student meeting entitled “*Biomedical Engineering in the UK: Career Prospects*”

30th May, 2001

The recently established IEEE Engineering in Medicine and Biology Student Society for the UK and Republic of Ireland organised their first student activity on 30 May 2001. The current student society chair, Andreas Pohlmann of Oxford Brookes University along with Dr Christopher James, a biomedical

engineer and lecturer at Aston University in Birmingham interested in the promotion of biomedical engineering in the UK, organised the half-day event specifically for postgraduate students working in the field of biomedical engineering.

The meeting, which was held at Oxford Brookes University, was themed “*Biomedical Engineering in the UK: Career Prospects*”. Students from various university departments from around the UK were invited to attend and participated in discussions led by academics working in the field and representatives of major industrial players in the biomedical engineering field. The student society, which has gained 50 members since its establishment last November, was very pleased with the number of attendees (25-30) and pleasantly surprised to see how many students had travelled to Oxford solely for this event from places such as London, Leicester, or Coventry.

After a light buffet lunch, Dr James introduced the first speaker, Dr Chris McLeod of Oxford Brookes University, who introduced to those present an academic’s perspective to a career in biomedical engineering in the UK. The second speaker was Peter Nattrass of GE Medical Systems who introduced the company and their products related to the biomedical field. Dr James then led a discussion on the definition of biomedical engineering and the different roles a biomedical engineer in society can undertake. Dr Mark Robinson of Cardionetics Ltd, makers of intelligent cardiac monitors, then demonstrated their latest product the C.Net 2000. Competing for the Short Presentation Award, five students then gave a presentation on their work, these included:

Christian Behrenbruch, Oxford University: Image ‘Fusion’ to Support Breast Disease Management.

Gari Clifford, Oxford University: Detection of Abnormal Beats in the Electrocardiogram.

Anita Boardman, University of Leicester: The optimum order of autoregressive models for heart rate variability.

Mengxing Tang, De Montfort University: Improving EIT image quality by multiple meshes image reconstruction.

Wei Lee Woon, Aston University: Nonlinear Analysis of Single Channel MEG Time Series.

A prize for best presentation was awarded to Anita Boardman of the University of Leicester and Peter Nattrass presented a book token generously provided by GE Medical Systems as well as a year’s student membership in the IEEE and EMBS courtesy of the EMBS UK & RI Chapter. The event was rounded off by a short discussion on the future of biomedical engineering in the UK led by Professor Lionel Tarassenko of Oxford University.

The meeting was a resounding success, with both student attendees as well as representatives from industry unanimous in their wish to participate in similar future events.

4.3 Funding

Additional resources and financial support for special projects such as seminar speakers, a local student paper competition and S-PAC's (Student Professional Awareness Conference) are available from EMBS, the IEEE Section, and the Region. The student activities section of the IEEE website (https://www.ieee.org/membership_services/membership/students/index.html) contains information on funding available from IEEE. This section describes funding opportunities from EMBS specifically.

4.3.1 Funding Proposals for EMBS Clubs and Chapters

Your club or chapter may wish to apply for funding for events such as guest speakers, career fairs or industry tours. EMBS provides up to \$500 USD for clubs and \$1000 USD for chapters, however this is matching funding. Your club or chapter must raise "seed" money, and EMBS provides additional support using a 2:1 matching ratio. If your club raises \$100 USD, then you

may apply for up to \$200 USD from EMBS. Funds are on an as-available basis, so please get your proposals in early!

Procedures to make funding requests for Special Projects & Local Activities

- 1) Decide on local activity and location.
- 2) Estimate the expenses involved.
- 3) Contact the EMBS Executive Office for approval of funding at least one month prior to event. To obtain funds for a special project, the club must submit to the EMBS Executive Office a short proposal describing the reason for the request and a budget. A good funding proposal includes:
 - a description of the event that you are proposing
 - statement of objectives (For a guest speaker, your objectives might be to provide an opportunity for your club members to learn about a particular topic and to recruit new EMBS members)
 - a plan briefly outlining the steps you will take to have a successful event (For a guest speaker, your plan might include organizational details such as publicity, room booking, A/V equipment, introduction of speaker).
 - a budget with letters of support indicating the amount of money contributed from other sources. Please remember to keep all receipts! You cannot be reimbursed without them.
- 4) Complete the Chapter Claim Form and send to the EMBS Executive Office with expense receipts and report of the event for reimbursement.

To obtain matching funding, you may want to approach:

- your department or faculty;
- your local IEEE section and student branch (look on the IEEE web page under Local Activities to find contacts);
- a group such as Women in Science and Engineering;
- your university student union,
- a university alumni association,
- your university career services group
- a professional engineering society in your local area,
- or co-sponsor the event with other local student chapters, such as American Society of Mechanical Engineers (ASME), CSME (the Canadian Society for Mechanical Engineers, the Association of Computing Machinery, (ACM), or the American Chemistry Society (ACS). Don't forget that there are many honour societies, such as such as the Engineering Honour Society, Tau Beta Pi, and the Electrical and Computer Engineering Honor Society, Eta Kappa Nu. There are also non-engineering undergraduate and graduate student societies who might be interested. Some topics, such as BioMEMS, lend themselves nicely to interaction with mechanical or electrical engineering groups, while nanobioscience topics might call for interaction with groups from chemistry, bioinformatics might call for interaction with computer engineering, and robotics might call for interaction with an automotive society.

For more details on funding, please check the electronic resources for the following forms.

- chapter claim form

- distinguished lecturers claim form and DL guidelines.

4.3.2 Funding Guidelines for the Distinguished Lecturer Program

The EMBS has established a Distinguished Lecturer Program. One objective of the program is providing a resource list of Distinguished Lecturers/Speakers from within the EMBS. The list is a convenient resource for arranging high quality presentations to EMBS Chapters, Student Branch Chapters, and Student Clubs. A second objective of the program is to encourage EMBS groups to invite Distinguished Lecturers by providing matching funding assist in covering travel expenses of the lecturers.

Procedures to make funding requests for Distinguished Lecturers:

Clubs and chapters are eligible for up to \$1000 USD in matching funds. The matching ratio is 2:1, with EMBS providing up to twice the amount raised from some other source. A limited amount of funding is available, so please get your requests in early.

Where EMBS funding is sought to support a Distinguished Lecturer for a particular meeting, the following procedures should be carried out:

- Ask the Distinguished Lecturer informally to check out general availability on the dates of interest; you may optionally indicate that request is subject to request for funding.
- Write to (e-mail) the EMBS Executive Director with a request for funding. The request is forwarded to Chair of the Distinguished Lecturer Program Committee for approval.
- After funding has been finalized, contact and arrange program date with Distinguished Lecturer.
- Following the lecture, the club or chapter is required to file a report to EMBS Executive Office that would be suitable for publishing in the EMB Magazine.

Step-by-Step Process

1. Decide which lecturer you'd like to invite, and check their travel schedule on the website.
2. Estimate the expenses involved. You will be able to apply for up to \$500 (clubs) or \$1000 (chapters) from EMBS, but you will have to find matching funds. Good sources are your Department, a local BME Company or IEEE Section.
3. Contact the EMB Executive Office for approval of funding.
4. Invite the DL to visit your school.
5. Book a room for the talk.
6. Find out what kinds of A/V equipment the speaker will need, and reserve it.
7. Publicize the talk. Emails, posters and announcements by professors in class are all effective.
8. Confirm arrangements with the DL, and provide them with maps of your campus, etc.
9. Make sure that you have somebody to introduce and thank the lecturer.
10. Complete the DL Claim Form and send to the EMB Executive Office with expense receipts and report of the event for reimbursement.

5 Ongoing club operations

So, you've started an EMBS club. How do you keep it going?

5.1 Executive committee

Share the responsibility! An executive committee has members such as a chair, vice -chair, treasurer, and secretary. This committee oversees the operations of the club, and likely meets more frequently than the club in order to organize activities for other club members. The executive may form other committees such as Events, Fundraising, and Communications. The Events committee may take responsibility for organizing a speaker series, and pass on tasks such as emailing and posterizing to the Communications committee. If this sounds like too many committees for your club, then the executive may simply help with delegating all the little tasks that need completing to make an event successful and ensuring that things get done. While it may be easier for the Chair to do all of these things, recruiting help from the membership will help strengthen the local organization and encourage participation. For large events, a committee may be more appropriate than a single volunteer due to the workload.

Motivate the Volunteers! Because there is no paycheck, what works in business does not always work for volunteers. Allow the volunteer to take ownership of a project and use their creativity in solving problems and issues. Although some volunteers may need to be told what to do in all cases, most will resent interference in the work they are doing, or do nothing for fear of making a mistake. Try to work towards a consensus among the volunteers rather than passing down a decision. Recognize that if the volunteer quits, the organization has lost a potential future leader and you may end up doing their work.

Recognize the Work of Volunteers! Helping the local chapter or club can involve a lot of hard work. Recognition of that work is important. Examples include: public recognition at a meeting, wall plaques, certificates or inexpensive gifts such as a coffee mug, or pen and pencil set with appropriate IEEE logo. The volunteer will appreciate the recognition and it will help motivate other members to participate in events. A local print shop or trophy shop will have some excellent inexpensive ideas for gifts. "Past Chapter Chair" pins, plaques and certificates are available from IEEE

(https://www.ieee.org/societies_communities/geo_activities/products/product_photos.html).

Recognize Time Conflicts! Since family, work, and community activities complete for the time of a member, officers should schedule meetings to accommodate their members' schedules. Find out what time your club/chapter membership is available. Talk to members who have stopped coming to meetings regarding meeting start times. Surveys of members concerning meeting times will provide valuable feedback.

5.2 Forming a group officially recognized by your student government

Some student governments provide support to clubs on campus. Your EMBS club may want to become a university or college club to gain access to resources and connections on campus. For example, some schools provide funding to clubs associated with a national or international society. Often, a constitution of some sort is required to form a campus club, and you'll find a sample constitution in the electronic resources.

5.3 Regular meetings

Your club may want to hold regular meetings e.g. the first Friday of every month. This helps your members to plan their time, and also ensures that your club keeps going. Meetings may involve a speaker, a discussion on a current topic in biomedical engineering, planning a future event such as a tour, or socializing. There are suggestions for regular meetings, executive committees and more in the sample constitution found in the electronic resources.

6 Electronic resources

Many of these resources are Word documents or PowerPoint slides, and contains multiple pages.
To access, please click on the object and it will be opened as a separate document.

- Sample poster for meeting,
- Sample email for 1st meeting,
- Survey for 1st meeting (interest of members),
- Slides for 1st meeting (PowerPoint),
- Form to start a club,
- Form to start a chapter,
- Student membership form,
- Expense claim form,

6.1 Sample poster of a meeting

<http://egr.uri.edu/embs/first-meeting-of-the-semester-2/>

6.2 Sample email

- Hello,

We are starting up an Engineering in Medicine and Biology club at the University of Calgary. The goal of our club is to provide an opportunity for people to learn about biomedical engineering. We'll have access to lots of technical resources, and plan to organize tours of biomedical engineering facilities, invite speakers and network with biomedical engineers in Calgary.

If you'd like to get involved, please plan on attending our first meeting:

Friday October 19
12:15 to 12:45 p.m.
Engineering building, room A227

6.3 Sample survey of meeting topics

<https://www.surveymonkey.com/r/5LJKGLJ>

6.4 Sample PowerPoint slides for first meeting

http://www.eng.uwaterloo.ca/twiki/pub/Embs/EmbsResources/2006-02-06_General_Meeting.ppt

6.5 Club establishment form

<http://students.embs.org/clubs-chapters/student-club-petition/>

6.6 Starting a student chapter

<http://students.embs.org/clubs-chapters/>

6.8 Distinguished Lecturer claim form

<https://www.embs.org/wp-content/uploads/2015/04/dlform.pdf>

Background Reading on Exciting Projects other Clubs and Chapters have Developed

7.1 Promoting engineering through recruitment

<http://ieeexplore.ieee.org/document/1280898/>

7.2 Student leadership: Biomedical engineering initiatives at Carleton university

<http://ieeexplore.ieee.org/document/1280902/>

7.3 BME education programs at an EMBS student club

<http://ieeexplore.ieee.org/document/1280899/>