Clinical Engineering Internship

The Clinical Engineering Internship at the University of Connecticut is a hospital-based, two-year program that has included Hartford Hospital, the University of Connecticut Medical Center, West Haven VA Hospital, UMass Medical Center, St. Francis Hospital in Hartford (Premier Inc.), Rhode Island Hospital in Providence, RI, Middlesex Memorial Hospital in Middletown, CT, and the Baystate Health System in Springfield, Massachusetts. This program was first established in the greater Hartford area in 1974 and moved its academic affiliation to the University of Connecticut in 1996.

As part of the selection process of candidates, students are invited to the hospital and campus in February and March for an interview. An interview is required to secure an internship. Students selected and participating in the M.S. Clinical Engineering Internship receive a stipend during the academic year and summer support may also be available from some of the participating hospitals. Please note that a tuition waiver and health care benefits are not included in the internship.

Application Procedure
Required in the application package for the Clinical Engineering Internship:

- Application Form (http://grad.uconn.edu/)
- Statement of Purpose/Personal Statement describing applicant’s interest in biomedical engineering, indication of interest in the Clinical Engineering Internship, and any other information that might be helpful for evaluation purposes
- Three letters of recommendation that are written and dated within one calendar year of the application submission
- Résumé or CV
- Official Transcripts
- GRE Scores (required for applicants that received previous degree from an institution outside of the US)
- TOEFL Scores (required for international applicants)

An interview is required before admission can be offered. Interviews are conducted in person at the hospital(s) offering an internship position.

M.S. Degree and Curriculum
The degree awarded is either a Plan A or Plan B Master of Science in Biomedical Engineering from the University of Connecticut.

Plan A for Clinical Engineering Interns
A total of eight graduate courses (24 credit hours) are required and Thesis Project (9 credits of GRAD 5950). The following courses are recommended for all Clinical Engineering Interns:

- BME 5000 (310) - Physiological Systems I
- BME 5020 (350) - Clinical Engineering Fundamentals
- BME 5500 (311) - Clinical Instrumentation Systems
- BME 5050 (351) - Engineering Problems in the Hospital
- BME 5030 (352) - Human Error and Medical Device Accidents
BME 5040 (356) - Medical Instrumentation in the Hospital

However, students are not restricted to only take BME courses. After discussion with your major advisor and/or advisory committee, courses are selected that are deemed appropriate to fulfill graduation requirements and should be from engineering disciplines related to the intern's background, interests and future career plans. BME 5600 (Human Biomechanics), BME 5700 (Biomaterials and Tissue Engineering) and BME 5100 (Physiological Modeling) are strongly encouraged.

Most students take two classes a semester and leave the summers free to work on their Master’s Thesis. Interns are expected to present and publish their Master’s Thesis at a conference (or have their paper accepted) before graduation.

**Plan B for Clinical Engineering Interns**

A total of ten graduate courses (30 credit hours) are required. The following courses are recommended for all Clinical Engineering Interns doing a Plan B:

- BME 5000 (310) - Physiological Systems I
- BME 5020 (350) - Clinical Engineering Fundamentals
- BME 5500 (311) - Clinical Instrumentation Systems
- BME 5100 (315) - Physiological Modeling
- BME 5050 (351) - Engineering Problems in the Hospital
- BME 5030 (352) - Human Error and Medical Device Accidents
- BME 5040 (356) - Medical Instrumentation in the Hospital

However, students are not restricted to only take BME courses. After discussion with your major advisor and/or advisory committee, courses are selected that are deemed appropriate to fulfill graduation requirements and should be from engineering disciplines related to the intern's background, interests and future career plans. It is the responsibility of the student to keep records of core course approvals. BME 5600 (Human Biomechanics) and BME 5700 (Biomaterials and Tissue Engineering) are strongly encouraged.

Students pursuing a Plan B MS are required to take clinical rotations all four semesters rather than two semesters. There are no publication requirements for Plan B MS degree students.

**Master’s Proposal, Project and Thesis Requirements**

Please refer to the “M.S. Degree and Curriculum” section of this handbook for more information.

**Timeline**

The program requires that the entire two academic years be spent working at the hospital, taking courses, and working on the Master’s project.

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1 BME 5040 will be removed as a required Clinical Engineering Internship course beginning 2009-2010.

2 BME 5040 will be removed as a required Clinical Engineering Internship course beginning 2009-2010.
Internship Start Date, End Date, Holidays and Work Hours
Please note: Dates listed below are subject to change from year to year and are used as an example of the structure of this program.

The time commitment by the intern to the hospital is 20 hours per week. Working more than 20 hours per week is at the discretion of the intern. The rotations through hospital departments and work on the MS thesis are not part of the 20 hours per week of internship.

The first day of the year is typically at the end of August and the last day of the year is in the middle of May. This is true for both 1st and 2nd year interns. For 2nd year interns, graduation is usually the end of the first week of May; you are still required to work as an intern 20 hours per week until the official end of the semester. The schedule of hours worked each week by the intern are at the discretion of the hospital Clinical Engineering Director so that the intern can be included in meetings, planned work events, etc. The only time not scheduled for the internship is during class time (typically 6-9pm on two days a week) and travel to the class.

During the academic year, the intern's vacation schedule usually coincides with holidays observed in the University of Connecticut academic calendar (from August to May). If the University of Connecticut is closed for a snow day, the intern does not have to make the day up. The only vacation for interns are the official holidays observed by the State of Connecticut and 2 weeks provided for the Christmas holidays, usually from December 18 – January 5. The time off for the Christmas holidays are decided mutually between the intern and the hospital Clinical Engineering Director. Those are the only vacations during the August to May time period. Spring break is not a holiday for the interns and you may be expected to work that week.

If for some reason an intern needs to take time off during the academic year, those hours missed can be made up if approved by the hospital Clinical Engineering Director. If an intern is sick, you may need to make up the hours missed.

Interns not working the appropriate number of hours during the internship will have their graduation delayed until all internship hours are worked. Before graduation, the hospital Clinical Engineering Director will sign off that the intern has fulfilled the number of internship hours for two academic years, and that the 2nd year intern will work from graduation until May 23rd.

First Year
During the first year, the student works in the hospital by rotating through various departments (such as plant engineering, emergency room, operating room, cardiac and pulmonary laboratories, etc.). He or she is considered part of the staff of that department during the rotation, and is expected to contribute to the function of the department by providing engineering services. Work on the Master's Thesis is also expected to occur during the first year by first identifying the project and then doing a background investigation (a good source of a project is identifying it during the rotations).

The rotation schedules vary among institutions, but for the most part include:

- Clinical Engineering
- Operating Room
- Anesthesiology
- Emergency Room
- ICU, Adult and Neonatal
- Respiratory Therapy
- Physical Therapy
- Lab Medicine/Pathology
- Radiology
- Nuclear Medicine
These rotations are usually between two-weeks to one-month.

The intern must be aware of the vast opportunities available in the internship program. Individual initiative and drive are important. Hospital staff members are not always fully aware of a student's knowledge and background; therefore, the intern must ask questions and become involved. During this process, opportunities for learning present themselves only by proactive measures by the intern.

The responsibilities of the intern during the first year may include some of the following:

- Assisting in the equipment management program by performing corrective maintenance and preventive maintenance on specific medical equipment
- Performing incoming inspections on new equipment
- Performing electrical safety testing, and medical gas outlet testing
- Providing in-services for new equipment or new medical equipment users
- Preparing technology assessments or product comparisons
- Providing administrative support to the Director of Clinical Engineering with budgeting and Joint Commission on Accreditation of Healthcare Organizations (JCAHO) requirements.

**Summer Between the First and Second Year**

**Plan A Students:** During the summer between the 1st and 2nd years, the intern begins work on their Master’s Project. The intern works on the Thesis Proposal (details about the content of the Thesis Proposal, Thesis Project and Thesis are contained in the section —Master’s Proposal, Project and Thesis Requirements). An approved Thesis Proposal is due by September 15th. It should be reviewed first by the Clinical Engineering Director at the intern’s hospital and then Dr. Enderle. The third faculty member then reviews the proposal.

**Plan B Students:** Suggest pursing an internship at a hospital. See Clinical Engineering Director for suggestions.

**Second Year**

**Plan A Students:** The schedule of work is similar to the first year except the rotations are re-placed by work on the MS Thesis. The intern will schedule a meeting with the Thesis Committee during October. The committee will review the Thesis Proposal, Plan of Study, and general plan for the year.

**Plan B Students:** Student works in the hospital by rotating through various departments as in the first year.

**Instructions for Registering for Graduate Courses for Clinical Engineering Interns**

1st Year Students Fall Semester:

1. Register for courses, such as BME 5000 (Physiological Systems I), BME 5020 (Clinical Engineering Fundamentals) and GRAD 5950 (3 credit hours- Plan A students only).
2. Get an Email Account
3. Register for courses: via on-line Peoplesoft registration.
4. Wilbur Cross Building:
   a) Obtain Student ID from HuskyOne Card Office
b) Pay Tuition and Fee Bill at Office of the University Bursar

1st Year Students Spring Semester:
1. Register for required Biomedical Engineering course, GRAD 5950 (3 credit hours-Plan A students only) and one course that meets professional interests or requirements.
2. Register for courses: via on-line Peoplesoft registration.
3. Pay Tuition and Fee Bill at the Office of the University Bursar in the Wilbur Cross Building

2nd Year Students Fall Semester:
1. Register for required Biomedical Engineering course, GRAD 5950, (3 credit hours-Plan A students only) and one course that meets professional interests or requirements.
2. Register for courses: via on-line Peoplesoft registration.
3. Pay Tuition and Fee Bill at the Office of the University Bursar in the Wilbur Cross Building

2nd Year Students Spring Semester:
1. Register for required Biomedical Engineering course(s), and one course that meets professional interests or requirements.
2. Register for courses: via on-line registration.
3. Pay Tuition and Fee Bill at the Office of the University Bursar in the Wilbur Cross Building

What is Expected from the Clinical Engineering Intern

- Workings 20 hours/week as a clinical engineer in the department working as if a regular employee
  - 4-6 hours/week - clinical rotations in the hospital during both semesters of their first year
  - 6-10 hours/week – working on their thesis project during both semesters of their first year
  - Up to 40 hours/week – working on the MS Thesis during the summer between the first and second year
  - 20 hours/week – working on their thesis project during both semesters of their second year
  - 20 hours/week – work to satisfy university course assignments (10 hour per course) each semester

The CE directors should have the same job expectations of the interns as any other employee and as such the interns must establish a mutually agreeable schedule and follow it. Unanticipated or unexcused absences are not acceptable, unless the Clinical Engineering department rules are followed.

The interns are expected to be productive, responsible and professional members of the clinical engineering department to which they are assigned. The directors are expected to mentor them in that direction.

What to Expect from the Internship Director

The Clinical Engineering internship director will arrange to meet with the department director and the interns at each hospital once per year to discuss important issues and current topics related to the internship program at that hospital. If additional meetings are needed they may be requested.

Each department director may be asked to guest lecturer at least once per year, teaching a class on material with which they are familiar. An outline of the material to be covered will be provided in advance.

The clinical engineering internship director will meet with the interns for a 3-4 hour organized Internship Meeting which will take place once per year in each separate internship hospital. We expect the hospital Clinical Engineering Director to give a 30-45 minute presentation on their career, their department, current CE
challenges, department development or some other interesting topic at these meetings. We will also have each of the interns give a 20-30 minute presentation, the internship program director will give a 30 minute presentation, we may ask a nearby CE director to give a guest presentation and finally we will ask that the interns arrange for a tour of an interesting area in the hospital.

**Clinical Engineering Work Assignments in the Hospital**

It is expected that the intern will be assigned to participate in the majority of the following activities at some point in their two year program.

- Establish a basic understanding of general medical equipment through 2-3 months of shadowing BMETs, performing inspections and minor repairs of a variety of devices contained in checklist of basic medical devices
- Develop new equipment inspection procedures
- Review and update/expand (if appropriate) department policy and procedures manual.
- Review / update employee job descriptions (if appropriate)
- Participate in an employee evaluation process (if appropriate – with consent)
- Prepare at least two short CE department staff in-service presentations (one per year) to teach
- Become familiar with JCAHO technology management standards and compare and comment on department practices designed to meet the standards
- Participate in department based JCAHO mock survey and participate in resolution of problems found.
- Participate in risk assessment of new technology for JCAHO inclusion
- Participate in the department’s competency assurance program
- Participate in at least one HFMEA or RCA development process.
- Participate in (and eventually lead if appropriate) department performance improvement program data collection process, including among other things a customer satisfaction survey
- Accompany department director to hospital safety committee; technology selection committee; capital planning committee and other committee meetings as appropriate
- Accompany department director to one department management meeting, hospital management meeting and department director’s one-on-one meeting with their administrator
- Make one presentation on behalf of the department to higher level hospital managers
- Be given the opportunity to interact with outside agencies, vendors or consultants
- Technology assessment to evaluate appropriateness of device to meet clinical need
- Evaluation of equipment for purchase including life-cycle cost analysis report, total cost of owner-ship report or new technology business plan
- Incoming inspections of new equipment or systems
- Installation of new equipment or systems (or oversee installation)
- Clinical staff in-service training program development (or oversee vendor training)
- Participate in the hospital’s equipment replacement planning process
- Participate in the process to manage the CE department’s website
- Participate in the development / management of the CE department’s computerized medical equipment management system
- Participate in a hospital expansion / renovation project, becoming involved review of the architectural, engineering and equipment selection parts of it
- Participate (if appropriate) in development of the annual department budget.
- Review codes & standards to evaluate the department’s /hospital’s regulatory compliance
- Participate in the management of an extended project
- Participate in the management of recalls and alerts program
- Participate in the evaluation of several service contracts
- Participate in the investigation of at least one incident involving a medical device.
Clinical Rotations in Technology Intensive Areas of the Hospital

- Time spent in the clinical environment observing the clinician - patient - technology interface
- Done during the first year only
- Arranged by the intern with the assistance of the second year intern, department manager or supervisor
- The intern would be the only CE person in the environment
  - Operating Room
    - Orthopedic Surgery
    - Ophthalmic surgery
    - Cardiac surgery
    - Neurosurgery
    - Vascular surgery
    - Outpatient surgery
    - Endoscopic / laser / image guided
  - Anesthesiology
    - Post-anesthesia Recovery Room
  - ICU
    - Surgical ICU
    - Post Cardiac
    - Pediatric
    - Neonatal
    - Specialty (burn/neuro/…)
  - Diagnostic Imaging
    - X-ray
    - Special procedures
    - Vascular
    - Ultrasound
    - Mammography
    - Nuclear Medicine
    - Cystoscopy
    - CT
    - MRI
    - Specialty (PET/SPECT/…)
  - Laboratory
    - Chemistry
    - Hematology
    - Pathology
    - Bacteriology
    - Blood bank
  - Endoscopic gastroenterology
  - Hyperbaric medicine
  - Ophthalmology laser clinic
  - Oncology / radiation medicine
  - Emergency room
  - Clinics (in hospital & remote)
  - Homecare
  - Dialysis
  - Electrocardiography
  - Electrophysiology
  - General Medical Floor
  - General Surgical floor
  - Administration (Finance, Purchasing, Receiving, Stores, Central Supply
  - Engineering (medical gases, electricians, HVAC, energy management)
- Information Services (Networking, Software support, Help Desk, PACS, electronic patient record)
Information on Medical Institutions That Have Participated in the Program

The University of Connecticut Health Center John Dempsey Hospital
(860) 679-2954
263 Farmington Avenue
Farmington, CT 06032
http://uchc.edu/

General Information:
SIZE: 210 beds (small)
LOCATION: Farmington, CT (10 miles west of Hartford)
PATIENT CARE: General, Surgery, Teaching

Clinical Engineering Dept. Information: The Clinical Engineering Department has 11 full-time persons. It is divided into three teams (Administrative, Hospital, and Hospital Support) each headed by a clinical engineer. All medical equipment is supported, including beds, sphygmomanometers, etc. In addition, the department supports the Clinical Laboratories as well as Radiology, which are excellent opportunities not available in most hospitals.

Responsibilities: First year students spend 20 hours per week in the Clinical Engineering Department doing electronics work, self-paced courses, reading of manuals, repairs, inspections of medical equipment, and special projects for the director. Students gain knowledge of all equipment, as the intern is paired with each engineer and technician for a period of time. All areas of the hospital are available for rotations and welcome interns, and, depending on his or her interests, the intern can determine where and how long to spend on each rotation. Second year students spend 20 hours per week in the Clinical Engineering Department. The in-tern assists the department with special projects, works on management projects including QA activities, customer satisfaction surveys, analysis of service histories, special equipment installations and more in-depth training on a wide range of health care technology. Time off for personal needs, holidays and vacations can be arranged. Students usually take vacations in accordance with the schedule of classes at the University of Connecticut.

Living Arrangements: There are no living arrangements at the hospital, though the Medical School Office has a listing of available apartments in the area.
Hartford Hospital
(860) 545-3915
80 Seymour Street
Hartford, CT 06115
http://www.harthosp.org/

**General Information:**
SIZE 900 beds (large)
LOCATION Downtown Hartford (south side)
PATIENT CARE General, Surgery, Trauma

**Biomedical Engineering Dept. Information:** The Biomedical Engineering Department consists of 20 people divided into two teams: Respiratory, OR, Anesthesia & Medical Electronics. The Biomedical Engineering Department primarily provides technical support and consultation to all other engineering and maintenance departments throughout the hospital. Each individual department in the hospital has its own technical support personnel where required (e.g. radiology, chemistry, and respiratory therapy). The general electrical repair of monitoring equipment from the floors is handled by the Medical Electronics division of engineering services. The intern, however, has access to all areas of engineering services and the hospital.

**Responsibilities:** First year students spend 20 hours per week in clinical rotations. It is the responsibility of the students to schedule these rotations and to determine the amount of time to be spent in each department. (Certain rotations are required.) All areas of the hospital are available for rotations and welcome interns. Some time is spent in the department doing repairs, inspections of medical equipment, and special projects for the director. Second year students are required to spend all time working on their project. Arrangement of tours, and interviews of prospective students are responsibilities shared with the first year in-tern. Time off for personal needs, holidays and vacations can be arranged. Students usually take vacations in accordance with the schedule of classes at the University of Connecticut.

**Living Arrangements:** The Educational Resource Center at Hartford Hospital has a dormitory which certain staff and Allied Health students are allowed to occupy. The clinical engineering students can rent a room on a month by month basis for the two year internship or until other living arrangements can be made. For more information contact Hartford Hospital.
Baystate Health System
(413) 784-3382
3601 Main Street Springfield, MA
01199
http://baystatehealth.com/Baystate

General Information:
SIZE    700 beds (large)
LOCATION  Springfield, MA (30 miles north of Hartford)
PATIENT CARE  General, Surgery, Trauma, Teaching

Clinical Engineering Dept. Information: The Clinical Engineering Department has 25 full time persons and is considered large. This department supports medical equipment, as well as typewriters and paging systems. For example they do not fix beds, sphygmomanometers etc. It possesses modern test equipment as well as computer facilities. Opportunities exist to work with all equipment supported by the department.

Responsibilities:  First year students spend 20 hours per week in the Clinical Engineering Department doing re-ports, presentations, asset management, database management, and inspections of medical equipment. Clinical rotations occur during work, depending on the schedule the intern sets up. All departments in the hospital are available for rotations and welcome interns. The students also have an opportunity to assist in many administrative capacities by participating on Medical Center Committees. Second year students spend 20 hours per week in the department, with the additional time spent working on the project. Arrangement of tours, and interviews of prospective students are responsibilities shared with the first year intern. Time off for personal needs, holidays and vacations can be arranged. Students usually take vacations in accordance with the schedule of classes at the University of Connecticut.

Living Arrangements: There are no living arrangements at the hospital. Previous interns have lived in Springfield and Chicopee, while others have chosen to live closer to Hartford.
VA Connecticut Healthcare System (West Haven)
(203) 932-5711, EXT. 5550
Clinical Engineering Dept.
950 Campbell Ave. West Haven,
CT 06516
http://www.connecticut.va.gov

General Information: The VA Connecticut Healthcare System is a part of VISN1 (VA New England Healthcare System) of the 22 VISN (Veterans Integrated Service Networks) facilities nationwide.

Services: VA Connecticut Healthcare System provides specialized services for women, Geriatric Rehabilitation and Extended Care Services, hospice and respite care, pharmacy services, dental care, psychological/pastoral counseling, psycho-social support services, podiatry, prosthetics, same day surgery, alcohol and substance abuse treatment and specialized services for diabetics. In summary, VA Connecticut provides primary, secondary and tertiary care in medicine, geriatrics, neurology, psychiatry and surgery with an operating bed capacity of 170 VA Connecticut encompasses an

Inpatient facility and Ambulatory Care Center in West Haven; an Ambulatory Care Center of Excellence in Newington, and five primary care Community Based Outpatient Clinics throughout the Connecticut region.

Research and National programs: VA Connecticut conducts research in psychiatry, medicine, surgery, neurology and related basic sciences. National Veterans Health Administration programs located at VA Connecticut include the following:

- Eastern Blind Rehabilitation Center and Clinic
- Northeast Program Evaluation Center (NEPEC)
- Coordinating Center for Cooperative Studies Program
- National Virology Reference Laboratory for Tuberculosis and Other Mycobacterial Diseases
- Mental Illness Research, Education and Clinical Center (MIRECC)
- National Center for PTSD
- National Center for Research in Alcoholism and Substance Abuse
- VA/Yale Center for Neuroscience and Nerve Regeneration
- Rehabilitation Research Center for Excellence
- Clinical Epidemiology Center

Clinical Engineering Program: The Clinical Engineering services at VA Connecticut is part of the consolidated Clinical Engineering Program of VISN 1, which allows the Clinical engineering services and resources to be shared amongst the facilities within the network. The Chief of Clinical Engineering at VA Connecticut is responsible for the West Haven CT, Newington CT and Northampton VA Medical Center at Leeds MA. Currently there are 6 Tech. Stationed at the West Haven facility each having their own specialty areas e.g. Radiology, Laboratory, Specialty care units, Cardiology etc. There is one tech stationed at the Newington campus. First and second year students spend 20 hours per week in the Clinical Engineering Department doing reports, presentations, asset management, database management, and inspections of medical equipment. The vastly diversified areas of the VA Connecticut facilities and it being part of a wide network of VA facilities in the New England region widens the horizon of opportunities to acquire and explore knowledge giving a hands on experience on virtually each aspect of healthcare.
University of Massachusetts Memorial Medical Center
(508) 334-6327
Clinical Engineering Department, South 4
119 Belmont Street,
Worcester, MA 01605-2982.
http://www.umassmemorial.org

General Information:
SIZE 780 beds (large)
LOCATION Worcester, MA (40 miles west of Boston)
PATIENT CARE General, Surgery, Trauma, Teaching

Clinical Engineering Dept. Information: The Clinical Engineering Department has 21 full-time persons. It is divided into three teams (Memorial, University and Hahnemann campuses, Clinton and Health Alliance Hospitals and other satellites). All medical equipment is supported, including beds, sphygmomanometers, etc. In addition, the department supports the Clinical Laboratories as well as Radiology. The in-tern has access to all areas of engineering services and the hospital.

Responsibilities: The student spends 20 hours per week in the Clinical Engineering Department doing electronics work, reading of manuals, repairs, inspections of medical equipment, and special projects for the director. Students gain knowledge of all equipment, as the intern is paired with each engineer and technician for a period of time. All areas of the hospital are available for rotations and welcome interns, and, depending on his or her interests, the intern can determine where and how long to spend on each rotation. The intern also assists the department with special projects, works on management projects including QA activities, customer satisfaction surveys, analysis of service histories, special equipment installations and more in-depth training on a wide range of health care technology. Time off for personal needs, holidays and vacations can be arranged. Students usually take vacations in accordance with the schedule of classes at the University of Connecticut.

Living Arrangements: There are no living arrangements at the hospital. Previous intern has lived at Worcester which has colleges close to the hospital. Apartments for rent near the hospital can be found easily.
Providence VA Medical Center
(401) 273-7100
Clinical Engineering Department
830 Chalkstone Ave.
Providence, RI 02908
Director of Clinical Engineering: Gil Pina, ext. 2096
http://www.providence.va.gov/

General information:
SIZE: 119 beds
LOCATION: Providence, RI
PATIENT CARE: General, Surgery, Teaching

The VA Connecticut Healthcare System is part of VISN1 (VA New England Healthcare System) of the 22 VISN (Veterans Integrated Service Networks) facilities nationwide.

Services:

VA Providence Healthcare System provides specialized services for geriatric rehabilitation and extended care services, hospice and respite care, pharmacy services, dental care, psychological/pastoral counseling, psycho-social support services, podiatry, prosthetics, same day surgery, alcohol and substance abuse treatment and specialized services for diabetics. In summary, VA Providence provides primary, secondary, and tertiary care in medicine, geriatrics, neurology, psychiatry, and surgery with an operating bed capacity of 119. VA Providence encompasses an Inpatient facility and Ambulatory Care Center in Providence; and five primary care Community Based Outpatient Clinics throughout Massachusetts and Rhode Island including Hyannis, New Bedford, Middletown, Martha”s Vineyard, and Nantucket. Clinical Engineering Program: The Clinical Engineering services at VA Providence are part of the consolidated Clinical Engineering Program of VISN 1, which allows the Clinical engineering services and resources to be shared amongst the facilities within the network. Currently there is a Director of Clinical Engineering and 4 BMETs stationed at the Providence facility each having their own specialty areas e.g. Radiology, Laboratory, Specialty care units, Cardiology, etc. First and second year students spend 20 hours per week in the Clinical Engineering Department working with the Director of Clinical Engineering and BMETs doing reports, presentations, as-set management, database management, and inspections of medical equipment. Additionally, interns make arrangements to do clinical rotations in their areas of interest. The vastly diversified areas of the VA Providence facilities and its part of a wide network of VA facilities in the New England region widen the horizon of opportunities to acquire and explore knowledge giving a hands-on experience in virtually every aspect of healthcare.
RELATED INFORMATION

What publications will tell me more about clinical engineering?
The following is a short list of the major publications where you can find information on Clinical Engineering. Because the field is growing every day, more information is readily available.

1. *The Journal of Clinical Engineering*
3. *Biomedical Instrumentation & Technology* (AAMI)

For more information about these publications, contact your local Medical School Library or one of the interns.

What professional organizations will I be eligible to join?
With any profession comes obligations to continue your education and further the development of your profession. Clinical Engineering is no exception. There are a wide variety of organizations that as an intern you are eligible to join. Below is a short list of some of the more important organizations and a number to call to find more out about it.

1. AAMI (Association for the Advancement of Medical Instrumentation); 703-525-4890
2. IEEE EMBS (Institute of Electrical and Electronics Engineers, Engineering in Medicine & Biology); (908) 562-5523
3. ACCE (American College of Clinical Engineers); 610-825-6067
4. ASHE (American Society of Healthcare Engineering, part of American Hospital Association); (312) 422-3800
5. AFSMI (Association for Field Service Management International)
6. NESCE (New England Society of Clinical Engineering); 860-679-2954

The various activities of these organizations will include conferences, meetings, and critical networking to aid you in your professional career as a Clinical Engineer.

What are past interns doing today?
Most of the past interns have positions as Clinical Engineers or Directors of Clinical Engineering. Other interns go into industry and work for companies like Hewlett Packard, Eli Lilly Corp., or Medtronic Corp. Still others enter the service industry and work as a Service Representative for large companies like General Electric or Siemens. Finally, there are students that go on to medical school or pursue a PhD in a related field. In essence, the opportunities are tremendous with the internship experience and the degree.

Even though no actual recruiting takes place, most students are able to locate employment prior to graduating in May of their second year.

What has been written about this program?
The following are some articles that you may find useful as you think about this program. If you have difficulties finding them, please do not hesitate to contact one of the interns, as they will be happy to send you a copy.
The entire issue of the May 2004 *EMB Magazine* is devoted to Clinical Engineering.


Finally, for those with a love of statistics and a streak of greed, the *Journal of Clinical Engineering* conducts a yearly survey of the salaries and responsibilities of clinical engineers and biomedical technicians. It is very comprehensive, and is definitely worth looking at.

**Clinical Engineering Internship Checklist**

In order to make your transition into the Clinical Engineering Internship easier, the following checklist is provided.

1. Receive notice in mid-April regarding acceptance
2. Contact your future director in April and thank him or her
3. In mid-July start thinking about Living arrangements
4. In August, contact the other interns and introduce yourself
5. Put your apartment hunt in high gear if you haven’t yet found a place
6. Plan on moving to the area (mid to late August)
7. Official start date for interns is in late August (see director)
8. Contact your director to notify that you are in the area
9. Register for classes if you haven’t already done so
10. Start classes (late August)

Remember, this is only a suggested checklist. You are in no way required to adhere to it, though it does provide some important recommendations.