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Bachelor of Science Degree in Biomedical Electronics Engineering

University of Rhode Island Faculty Senate

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Chair-Pres. ltr 11-7-74

Serial Number 74-75--5

UNIVERSITY OF RHODE ISLAND
Kingston, Rhode Island

RECEIVED
UNIVERSITY OF R. I.
OCT 1 1974
OFFICE OF THE PRESIDENT

FACULTY SENATE
BILL

Adopted by the Faculty Senate

TO: President Frank Newman

FROM: Chairman of the Faculty Senate

1. The attached BILL, titled Bachelor of Science Degree in Biomedical Electronics Engineering

, is forwarded for your consideration.

2. The original and two copies for your use are included.

3. This BILL was adopted by vote of the Faculty Senate on September 26,1974 (date)

4. After considering this bill, will you please indicate your approval or disapproval. Return the original or forward it to the Board of Regents, completing the appropriate endorsement below.

5. In accordance with Section 8, paragraph 2 of the Senate's By-Laws, this bill will become effective on October 17,1974 (date), three weeks after Senate approval, unless: (1) specific dates for implementation are written into the bill; (2) you return it disapproved; (3) you forward it to the Board of Regents for their approval; or (4) the University Faculty petitions for a referendum. If the bill is forwarded to the Board of Regents, it will not become effective until approved by the Board.

September 30, 1974
(date)

Albert J. Lott
Chairman of the Faculty Senate

ENDORSEMENT 1.

TO: Chairman of the Faculty Senate

RECEIVED
NOV 7 1974
UNIVERSITY OF RHODE ISLAND
FACULTY SENATE

FROM: President of the University

1. Returned.

2. Approved ✓ 11-7-74 Disapproved _____.

3. (If approved) In my opinion, transmittal to the Board of Regents is not necessary.

11/7/74
(date)

Frank Newman
President

(OVER)

Form revised 6/74

ALTERNATE ENDORSEMENT 1.

TO: Chairman of the Board of Regents

FROM: The University President

1. Forwarded.

2. Approved.

_____ (date) _____ President

ENDORSEMENT 2.

TO: Chairman of the Faculty Senate

FROM: Chairman of the Board of Regents, via the University President.

1. Forwarded.

_____ (date)

_____

_____ (Office)

ENDORSEMENT 3.

TO: Chairman of the Faculty Senate

FROM: The University President

1. Forwarded from the Chairman of the Board of Regents.

_____ (date) _____ President

Original received and forwarded to the Secretary of the Senate and Registrar for filing in the Archives of the University.

_____ (date) _____

Chairman of the Faculty Senate

4-year B.S. program in the Department of Electrical Engineering

BIOMEDICAL ELECTRONICS ENGINEERING

FRESHMAN YEAR

First Semester

CHM 101 General Chemistry Lecture I	3
CHM 102 Laboratory for CHM 101	1
EGR 101 Introduction to Engineering and/or EGR 102 Basic Graphics	1-2
MTH 141 Introductory Calculus with Analytic Geometry	3
General education electives in Division A,C or D	6
	14-15

Second Semester

ZOO 111 General Zoology	4
MTH 142 Intermediate Calculus with Analytic Geometry	3
EGR 102 Basic Graphics if not taken in first semester	0-1
MCE 161 Mechanics I preferred or MCE 162 Statics or PHY 213 and 285 Elementary Physics and Physics Laboratory	3-4
CHM 124 Organic Chemistry	4
General education electives in Division A,C or D	3
	17-19

SOPHOMORE YEAR

First Semester

†MTH 243 Calculus and Analytic Geometry of Several Variables	3
†ELE 210 Introduction to Electricity and Magnetism	3
†MCE 261 or 263 Dynamics	3
ZOO 242 Introduction to Human Physiology	3
General education elective in Division A,C or D	6
	18

Second Semester

†ELE 211 Linear Systems and Circuit Theory I	3
†ELE 215 Electrical Measurements	2
CSC 201 Introduction to Computing	3
PHY 223 Introduction to Acoustics and Optics	3
General education electives in Division A,C or D	6
	17

JUNIOR YEAR

First Semester

ELE 312 Linear Systems and Circuit Theory II	4
ELE 322 Electromagnetic Fields I	3
MTH 362 Linear and Complex Analysis for Scientists and Engineers	3
PHY 340 Introduction to Modern Physics	3
General education elective in Division A or C	3
	16

Second Semester

ELE 313 Linear Systems	3
ELE 323 Electromagnetic Fields II	3
ELE 342 Electronics I	4
MCE 341 Fundamentals of Thermodynamics or PHY 420 Introduction to Thermodynamics and Statistical Mechanics	3
General education elective in Division A or C	3
	16

SENIOR YEAR

First Semester

ELE 443 Electronics II	5
ELE 586 Biomedical Electronics I or ELE 588 Biomedical Engineering I	3
ELE 481 Biomedical Engineering Seminar	1
ZOO 345 Basic Animal Physiology	3
Professional electives	3-6
	15-18

Second Semester

ELE 587 Biomedical Electronics II or ELE 589 Biomedical Engineering II	3
ELE 482 Biomedical Engineering Seminar	1
Professional electives	6
Free electives	6
	16

Total 128 to 135

†Prerequisite for advanced work in biomedical electronics engineering and should be taken before the junior year.

Summary of important features 9/26/74

(For information only, not part of official Senate bill)

Biomedical Electronics Engineering

A. Rationale for the proposed option

1. Increased utilization of technological advances in health care
2. Growing need for engineers in hospitals and the medical equipment industry
3. Increased demand by students for training in this area

B. Advantages of an undergraduate option starting in the Freshman year (rather than the Senior year)

1. Early career decision will provide for a better course selection and better education
2. Improved chances in the job market
3. More visibility for the program to prospective students in the state and nationwide
4. Increased support from federal and private sources

C. Impact on URI and Rhode Island

1. Strengthens the university's overall effort in the health care field
2. Increases utilization of existing resources within the university
3. Improves the university's input to health care delivery in the state

D. Resources required

Program is designed to tap existing resources within URI. All required courses already exist on campus. Departments whose courses are required have endorsed the program.

E. Recommendations and Endorsements

1. NIH recommended in 1973 the initiation of such programs at the undergraduate level
2. The following endorsements were obtained for the proposed URI program:

(1) Provost for Health Science Affairs
(2) Zoology Department
(3) Chemistry Department
(4) Rhode Island Health Science Education Council (attached).

Details of program are given on pages 97-108 of "Faculty Senate, Addendum to the Agenda for Meeting No. 16, May 19, 1974"

April 11, 1974

Dr. Charles Polk, Chairman
Department of Electrical Engineering
University of Rhode Island
Kingston, Rhode Island 02881

Dear Dr. Polk:

I have reviewed the proposed degree program in Biomedical Electronics Engineering. Although I cannot comment on the merits of the specific course outline and sequence, it may be appropriate for me to make several remarks which are supportive of the program as it relates to the area of health services.

It isn't necessary for me to stress the importance of understanding instrumentation from the technological standpoint in the biomedical field. This most certainly is common knowledge. However, with increased reliance on technology as applied to instrumentation, there is a significant contribution to be made. In the medical technology field, for instance, with increasing use of automated equipment, scanning devices, photometric and related apparatus, etc., there is an increasingly prominent role for the biomedical engineer. In the area of respiratory therapy, the sophistication of equipment continues to expand. The same could be said also for a number of other technological aspects of allied health occupations. This holds, also, for Coronary Care Units and Intensive Care Units.

It is apparent that one should plan to develop the expertise necessary to deal effectively with the ever increasing sophistication of instrumentation which is found in every phase of health service application, whether it be an auto-analyzer or a therapeutic device of cardio-pulmonary function.

By making available a curriculum such as found in the degree program in Biomedical Electronics Engineering, an unmet need will be addressed. This can lead only to improved quality of care for the future Rhode Island citizen.

Sincerely yours,

Edward Berg

EB:l

Edward Berg, Ph.D.
Director

RHODE ISLAND HEALTH SCIENCE EDUCATION COUNCIL
1145 RESERVOIR AVENUE, SUITE 124, CRANSTON, RHODE ISLAND 02920