EVALUATIVE REPORT OF THE DEPARTMENT

Department of Biomedical Engineering

1. **Name of the Department** :   **Biomedical Engineering**

2. **Year of Establishment**   : Department of Biomedical Engineering was established in the year 2006 in St. Peter's Engineering College which was declared as Deemed to be University in the year 2008.

3. **Is the Department part of a School / Faculty of the University**

   Department of the University

4. **Names of the Programmes offered (UG, PG, Ph.D., Integrated Masters; Integrated Ph.D., D.Sc., D.Litt. etc.)**

   - B.E. (BioMedical Engineering)
   - M.E. (BioMedical Engineering)
   - Ph.D.

5. **Interdisciplinary Programmes and Departments involved:**

   B.E. Bio Medical Engineering

S. No	Interdisciplinary Courses	Year / Sem	Department
1.	Technical English-II -213EHT01	I/II	English
2.	Mathematics-II – 213MAT01	I/II	Maths
3.	Engineering Physics-II -213PHT03	I/II	Physics
4.	Engineering Chemistry-II - 213CYT03	I/II	Chemistry
5.	Electronic Devices and Circuits - 213ECT05	I/II	ECE
6.	Circuit Theory – 213CTT06	I/II	EEE
7.	Transforms and partial Differential Equations- 308BMT01,312MAT01,313MAT01	II/III	Maths
8.	Signals and systems – 308BMT03,312BMT03,313BMT03	II/III	ECE
9.	Electronic Circuits – 308BMT05,312BMT05	II/III	ECE
10.	Biochemistry- 308BMT06,312BMT06,313BMT02	II/III	Biotech
11.	Object Oriented programming and data structures – 313BMT05	II/III	CSE

12.	Probability and Random Process-408BMT01,412BMT01,413BMT01	II/IV	Maths
13.	Basics of Electrical Engineering 408BMT03,412BMT03,413BMT03	II/IV	EEE
14.	Analog and Digital ICs - 408BMT04,412BMT04,413BMT04	II/IV	ECE
15.	Computer Networks-708BMT10,712BMT10	IV/VII	IT

6. **Courses in collaboration with other universities, industries, foreign institutions, etc.**

S. No	Course Name	Collaboration	Duration
1	Diploma in Biomedical Instrumentation	Received approval to collaborate with IMA- Indian Medical Association, Tamilnadu	Two Year

7. **Details of programmes discontinued , if any, with reasons**:

Nil

8. **Examination System : Annual/Semester/Trimester/Choice based Credit System**

Semester System and Choice Based Credit System (CBCS)

9. **Participation of the department in the courses offered by other departments.**

Nil

10. **Number of teaching posts sanctioned , filled and actual (Professors / Associate Professors / Asst. Professors / Others)**

	Sanctioned	Filled	Actual (including CAS & MPS)
Professors	2	2	2
Associate Professors	1	1	1
Asst. Professors	7	7	7

11. **Faculty profile with name, qualification, designation, area of specialization, experience and research under guidance.**

S. No.	Name	Qualification	Designation	Specialization	No. of Years of Experience	No.of Ph.D ./ M.E Students guided for the last 4 years.
1	Dr.Kasturi Kantharaj	M.B.B.S, M.D.	Dean & HOD Prof.	Sexually Transmitted Diseases & AIDS	More than 30 Years	3
2	Dr.Sri Dhatan	M.Sc, M.E, Ph.D	Prof.	Applied Electronics	6 Yrs	3
3	Subha Ramya.V	M.E.	Associate. Prof.	Biomedical Instrumentation, Applied Electronics	8 Yrs	3
4	Krishna Kumari.S	M.Tech.	Asst. Prof.	Biomedical, Instrumentation Engg.	2 years 6 months	3
5	K.Prithiv	M.E.	Asst. Prof.	Instrumentation Engg., Medical Electronics.	8 years	2
6	P.Balaji	M.E.	Asst. Prof.	Biomedical Engineering	-	-
7	Arun Kumar	M.Tech.	Asst. Prof.	Biomedical Engineering	-	-
8	S.P.Vaidheeshraj	M.E.	Asst. Prof.	Biomedical Engineering	-	-
9	Vanitha	M.Tech.	Asst. Prof.	Biomedical Engineering	-	-
10	R.Vaishnavi	M.E	Asst.Prof	Communication Systems	-	-

12. **List of senior Visiting Fellows, adjunct faculty, emeritus professors**.

Nil

13. Percentage of classes taken by temporary faculty – programmes-wise information.

Nil

14. Programmes-wise Student : Staff Ratio:

S.No	Programme	Sanctioned Strength	Student : Staff Ratio
1	B.E.-BME	90 (30*3)	15 : 1
2	M.E.-BME	36 (18*2)	12 : 1

15. Number of academic support staff (technical) and administrative staff: sanctioned, filled and actual.

	Sanctioned	Filled	Actual (including CAS &MPS)
Support staff (technical)	01	01	01
Administrative Staff	01	01	01

16. Research thrust areas as recognized by major funding agencies

- Medical Instrumentation
- Embedded System
- Diagnostic and Therapeutic Equipments

17. Number of faculty with ongoing projects from a) national b) international funding agencies and c) Total grants received. Give the names of the funding agencies, project title and grants received project-wise

a)   **National Funding Agencies**

S. No.	Name of the Investigator	Funding Agency	Project title	Total Grant	Status
1	Mr.K.Prithiv	MSME	Low Cost LED night lamp with variation in brightness control applicable for room dimension and consumers choice	2 lakhs	Received

b) **International funding agencies** : Nil

c) **Total Grants Received** : 2 Lakhs

18. **Inter-institutional collaborative projects and associated grants received**
   a) **National collaboration**   b) **International collaboration**

Nil

19. **Departmental projects funded by DST-FIST, UGC-SAP/CAS, DP; DBT, ICSSR, AICTE, etc; total grants received.**

Details of Departmental Projects funded

S. No	Name of the Investigator	Funding Agency	Project title	Grant Received	Status
1.	Mr.M.Vinoth & Ms.Subha Ramya	MSME	Device for active assist rehabilitation of elbow and wrist joint	2.30 lakhs	Received
2	Mr.M.Vinoth & Ms.Subha Ramya	MSME	Device for hand gesture to voice translation –A Dumb assist device	2.35 lakhs	Received
3	G.Gnancy Subha & Ms.Krishna Kumari	MSME	Prototype Development of Gluco "L"	4.70 lakhs	Received

20. Research facility / centre with

- **State Recognition** - Nil
- **National Recognition** - Nil
- **International Recognition** - Nil
- **Others**

S.No	Software Available
1.	MATLAB
2.	CCS Compiler
3.	Keil Compiler

S.No	Equipment/Hardware Kits available
1.	PICKIT 2 Burner
2.	Soldering Bath

21. Special research laboratories sponsored by / created by industry or corporate bodies.

Nil

22. Publications

a. **Number of papers published in PEER reviewed journals (national / international) :** Nil

b. **Monographs** :Nil

c. **Chapters in Books** : Nil

d. **Edited Books** :Nil

e. **Books with ISBN with details of publishers** :Nil

f. **Number listed in International Database (For e.g. Web of Science, Scopus, Humanities International Complete, Dare Database – International Social Sciences Directory , EBSCO host, etc) -** Nil

g. **Citation Index – range / average** :Nil

h. **SNIP** :Nil

i. **SJR** :Nil

j. **Impact Factor – range / average** :Nil

k. **h-index**: Nil

23. Details of Patents and income generated :

Nil

24. Areas of consultancy and income generated :

Nil

25. Faculty selected nationally / internationally to visit other laboratories / institutions / industries in India and abroad

Nil

26. Faculty serving in
a) National committees   b) International committees
c) Editorial Boards   d) any other (please specify)

a) Faculty Serving in National Committees   - Nil
b) Faculty serving in international committees - Nil
c) Faculty serving in editorial boards   - Nil

27. Faculty recharging strategies (UGC, ASC, Refresher / orientation programs, workshops training programs and similar programs.

Year	FDP	Training Prog.	Workshops	Seminars	Conference
2015	1	-	-	2	-
2014	7	-	-	-	-
2013	3	-	1	-	-
2012	4	-	-	-	-
2011	1	-	2	1	-
2010	2	1	-	-	-

Workshops/training program details are given below

S. No	Name of the Faculty	Program	Period	Organized by
1.	Ms.V.Subha Ramya, AP/BME	Seminar on WBAN –Sensing and Signal Processing Challenges	23.03.2015 & 24.03.2015	UGC

2	Ms.S.Krishnakumari AP/BME	Seminar on WBAN –Sensing and Signal Processing Challenges	23.03.2015 & 24.03.2015	UGC
3	Mr.K.Prithiv	Networking Technology Business Incubator and Knowledge Driven Entrepreneurs	06.02.2015 & 07.02.2015	DST
4	Mr.K.Prithiv	FDP on Entrepreneurship	08.12.2014 to 20.12.2014	DST
5	Ms.V.Subha Ramya	Research Methodologies	04.01.2013 to 06.01.2013	MIT Campus
6	Ms.Gayathri Subbiah	Fundamentals of Nanoscience	07.12.2011 to 21.12.2011	Anna University
7	Ms.Gayathri Subbiah	Popularization of research methodology and techniques	18.11.2011	St.Peters University
8	Ms.Jhonsy Mary Lect/BME Ms.Amlu Annama Abraham Lect/BME	Biomedical Science and Technology	02.03.2011 to 04.03.2011	Anna University
9	Ms.Jhonsy Mary Lect/BME Ms.Amlu Annama Abraham Lect/BME	Low power embedded system using MSP430 microcontroller	19.04.2011 & 20.04.2011	Anna University

28. Student projects

- **percentage of students who have done in – house projects including inter-departmental projects** -100%

- **percentage of students doing projects in collaboration with other universities / industry / institute** - **75%**

Year	% of inhouse project	% of project in collaboration with other university /industry/institute
B.E Projects		
2011-2015	100	-
2010-2014	100	-
2009-2013	100	-
2008-2012	100	-
M.E Projects		
2013-2015	50	50
2012-2014	100	-

29. Awards / recognition received at the national and international level by
   a. **Faculty**

S. No	Name of the Faculty	Details
1	Dr.K.Kantharaj Dean &HOD, Biomedical Engg	• Serving as a Member-Board of Studies in Adhiyamaan College of Engineeering • Serving as a Member –Board of Studies in Chettinad Academy of Research and Education(Deemed University) • Served in Doctorial Committee for Ph.D SRM University

   b. **Doctoral / Post-doctoral fellows** : Nil

   c. **Students** : Nil

30. Seminars / Conferences/ Workshops organized and the source of funding (national / international with details of outstanding participants, if any.

Academic Year	Seminars	Conferences	Workshops
2014-2015	3	-	-
2013-2014	-	1	-
2013-2012	-	-	-

S. No	Title of the program & Period	Convener / Co-ordinator	National / International	Funding Agency
1	Guest lecture on 'Embedded Systems, PLC,SCADA'. 20 Sep 2013	Mr.M.Vinoth Project Co-Ordinator Wiztech Solutions Pvt. Ltd.	National	Dept. of Biomedical Engg. St.Peter's University
2	Biomedical Signal Processing 10th Jan 2015	Dr.G.J.Srinivasan Dean,EIE,SPU	National	Dept. of Biomedical Engg. St.Peter's University
3	Biosignal Processing 28th Feb 2015	Dr.G.J.Srinivasan Dean,EIE,SPU	National	Dept. of Biomedical Engg. St.Peter's University
4	Fetal Sound and Maternal Sound.Reduction of the later to enhance the former while recording. 28th March 2015	Dr.G.J.Srinivasan Dean,EIE,SPU	National	Dept. of Biomedical Engg. St.Peter's University

31. Code of ethics for research followed by the departments

- Researchers must respect the rights, interests and dignity of participants and related persons in research.
- Research must be undertaken in accordance with any relevant common law or legislation.
- Informed consent should normally be obtained from participants.
- Consent itself should be given freely without force or coercion.
- Researchers have an obligation to protect research participants wherever possible from significant harm consequent upon the research.
- The confidentiality of information supplied by research participants any agreement to grant anonymity to respondents should be respected
- All research involving human participants whether undertaken by academic staff, other university staff or students is to be subject to ethical approval.
- Both the design of research and its conduct should ensure integrity and quality.
- Research is to be undertaken subject to the principle of academic independence. Where any conflicts of interest or partiality arise, these must be clearly stated prior to ethical approval being obtained.

32. Students profile programmes-wise. Annexure from certificate section

Name of the Programme (refer to question no.4)	Applications received	Selected		Pass Percentage	
		Male	Female	Male	Female
B.E. Bio Medical Engineering					
2008-2012	12	1	11	100 %	92%
2009-2013	08	2	6	100%	92%
2010-2014	05	2	3	100%	100%
2011-2015	07	2	5	50%	100%
M.E. Bio Medical Engineering					
2012-2014	03	1	2	100%	50%
2013-2015	04	2	2	50%	100%

33. Diversity of students :

Name of the Programme (refer to question no. 4)	% of students from the same university	% of students from other universities within the state	% of students from universities outside the state	% of students from other countries
M.E				
2012-2014	--	100	--	--
2013-2015	--	100	--	--
2014-2016	--	100	--	--

34. How many students have cleared Civil Services and Defense Services examinations, NET, SET, GATE and other competitive examinations? Give details category-wise.

S.No	Name of the Student	Programme &Batch	Competitive Exam Details
1.	S.Saranya	B.E 2009-13	GATE – 2013 Instrumentation Engg Category

35. Student Progression:

Student Progression	Percentage against enrolled			
	2012-13	2013-14	2014-15	2015-16
UG to PG	-	-	-	-
PG to Ph.D.	-	-	-	-
Ph.D to Post Doctoral	-	-	-	--
Employed • Campus Selection	-	-	-	-
• Other than Campus recruitment	100%	100%	50%	56%
Entrepreneurs	NIL	NIL	NIL	NIL

36. Diversity of staff

Percentage of faculty who are graduates	
of the same university	NIL
from other universities within the state	100 %
from universities from other states	NIL
from universities outside the country	NIL

37. Number of faculty who are awarded M.Phil., Ph.D., D.Sc., and D.Litt. during the assessment period.

Nil

38. Present details of departmental infrastructural facilities with regards to
   a) Library

Our department has a library with
- 8 lab manuals
- student project reports
- Project CDs
- 8 project kits
- NPTEL Lectures and also Central library having about 368 books related to Biomedical engineering

   b) Internet facilities for staff and students - Available

- Name of the Internet Provider : NKN + BSNL
- Available Bandwidth : 1 Gbps
- Students and staffs can access internet from the department. The university has 1Gbps internet connectivity.

   c) Total number of class rooms - 07

   d) Class rooms with ICT facility – OHP Available

   e) Students laboratories – 07

- Biomedical Instrumentation Lab
- Diagnostic and Therapeutic lab
- Human Physiology Lab
- Pathology and Microbiology Lab
- Digital Image Processing Lab
- Clinical Instrumentation Lab
- Bio-Signal Processing Lab

f) **Research laboratories** - 01 (Shared)

SAIF – Sophisticated Analytical Instruments Facility

39. List of doctoral, post-doctoral students and Research Associates
    a)   **from other host institution / university**
    b)   **from other institutions / universities**

Nil

40. Number of students getting financial assistance from the university.

Nil

41. Was any need assessment exercise undertaken before the development of new programme(s)? If so, highlight the methodology.

P.G programme (M.E Biomedical Engg.) was started because of

1. Increasing demand from U.G's
2. Enhanced job opportunities
3. Demand from research units
4. Job opportunities overseas.

42. Does the department obtain feedback from

a) **Faculty on curriculum as well as teaching –learning – evaluation? If yes, how does the department utilize the feedbacks?**

Yes, the department gets feedback from the faculty. These are discussed internally and the suggestions are implemented in a phased manner with the advice of the Vice Chancellor and the Director Academic.

b) **Students on staff, curriculum and teaching-learning-evaluation and how does the department utilize the feedbacks?**

The department obtains the feedback from the students on the faculty, curriculum and teaching learning methods. The suggestions regarding faculty and staff are discussed with the faculty. Issues, if any are resolved with the involvement of the Vice Chancellor and the Director Academic.

c) **Alumni and employers on the programmes offered and how does the department utilize the feedbacks?**

The department obtains feedback from alumni and employers. The feedback is analyzed and suggestions, if any are implemented.

43. List the distinguished alumni of the department

S. No.	Name of the Alumni	Batch	Company	Position
1	P.Induja	2008-12	Tamilnadu Medical Services Corporation	Biomedical Engineer
2	Abhishek	2008-12	Health Centre Muscat	Biomedical Engineer
3	Aliya Salma Begum	2009-13	Capital One Housing,Chennai	Adminstration Manager
4	Claudia .A	2009-13	Idascudder Hospitals,Ranipet	Biomedical Engineer
5	Vasanth.J	2010-14	Premium Medical system and devices pvt Ltd,New Delhi	Sales &Service Engineer.

44. Give details of student enrichment programmes (special lectures / workshops / seminar) including external experts.

Details of student enrichment program are given below:

S. No.	Event Name	Event Date	External Expert
Special lectures organized (2010-2015)			
1.	Embedded Systems, PLC, SCADA	20/09/2013	Mr.M.Vinoth Wiztech Solutions
Seminar organized from 2010-2015			
1.	Introduction to Nanotechnology	20/6/2014	Dr.Thangaraj Biotech Dept SPU

Workshop organized from 2010-2015			
1.	Hands on training on Different types of Spectrometer	05/03/2014	Dr.Gunasekaran Dean R&D SPU
Placement training organized from 2010-2015			
1	Live Life Curriculum for 1st, 2nd and 3rd year students	2012-2013	Dr. Kannan Girish Psychiatrist, Ms.Jennifer
2	Training on Analytical and communication skills for final year students	2012-2013	Smart Training Resources Pvt. Ltd, Chennai
3	Live Life Curriculum for 1st year students	2013-2014	Dr. Kannan Girish Psychiatrist, Ms.Jennifer
4	Training on Analytical and communication skills for final year students	2013-2014	Smart Training Resources Pvt. Ltd, Chennai
5	Training on Analytical and communication skills for final year students	2014-2015	Smart Training Resources Pvt. Ltd, Chennai
6	Training on Analytical and communication skills for final year students	2015-2016	Smart Training Resources Pvt. Ltd, Chennai

45. List the teaching methodology adopted by the faculty for different programmes

- Audio Visuals (Power point, OHP)
- Lectures
- Discussion
- Hospital Visits
- Live Projects
- Assignments
- Expert Lectures
- Hands on training on instruments.

46. How does the department ensure that programmes objective are constantly met and learning outcomes are monitored?

- Unit Test
- Model Exam
- Mini Training Projects
- Surprise test
- Class Committee Meeting
- Feedback Forms
- Student Profile Books

47. Highlight the participation of students and faculty in extension activities.

- Students are encouraged to participate in various extension activities by joining University level NSS programme, paper presentation, Sports and extracurricular activities.
- Some of the faculty members take part in Social Service Activities through NSS and YRC.

Students participated in extension activities like events conducted in symposium and workshops

S. No	Student name & class	Activity	Organised by	Period	Award received
1.	E.Pooja & G.F. Trishia Monica 3rd year	Workshop on embedded system	St.Peters University	20.9.2013	Participated
2.	M.Fazilath & E.Pooja 2nd year	Wheatstone lecture	The Institution of Engineering and Technology	12.10.2012	Participated
3.	M.Fazilath & E.Pooja 2nd year	Seminar on Hospital Management	The Shankara Nethralaya Academy	5.1.2013	Participated

4.	M.Fazilath & G.F. Trishia Monica 2nd year	Workshop on Recent Advances in Diagnostic Equipments	SSN College of Engineering	22.01.2013 & 23.01.2013	Participated
5.	Shree Ranjini & V.Pavithra 2nd year	Symposium BIOYANTRA'14	SRM University	09.10.2014 to 11.10.2014	Participated

Students Participated in Sports activities:

S. No	Student name & class	Event	Period	Position
1.	V.Pavithra 2nd year	Shotput Disc Shuttle cock	2013-2017	Winner Winner Runner
2.	J.Clarinda 2nd year	Shuttle cock	2013-2017	Runner
3.	R.Pavithra 2nd year	Shuttle cock	2013-2017	Runner
4.	G.Gnancy Subha 3rd year	Table tennis Throw ball Carom	2012-2016	Winner Runner Runner

48. **Give details of "beyond syllabus scholarly activities" of the department**

1. **National Service Scheme.**

Konambedu village --- Awareness on personal hygiene, diet requirements, prevention of common communicable diseases, Adult Education.

2. **Youth Red Cross.**

Awareness on communicable diseases, students role in public hygiene, Disaster management, first Aid training.

3. **Swach Bharath Scheme.**

Campus Cleaning

4. **Participation in the Disaster Management Seminar.**

Health Hazards and Management during Natural Disaster

5. **Anna University Edu Sat link:**

The University has Anna University Edu Sat link through which students and faculty have access to the classes which are conducted once a week by senior Professors on selected subjects.

SYMPOSIUM

S.No	Symposium name	Date	Chief guest
1.	MED'O' WIZ 2011	13.09.2011	Mr. Shanmuga sundaram, Regional Sales Manager, South Zimmer India Pvt.Ltd

INPLANT TRAINING/ INTERNSHIP

S.No	Student name	Company name	Period
1.	M.Fazilath & G.Gnancy subha	Vijaya Hospital, Vadapalani	Aug 2014
2.	J.Vasanthan & Saajidha batool	Deepam Hospital, Pallavaram	15.07.2013 to 20.07.2013
3.	J.Vasanthan & G.F. Trishia Monica	Chrisitian medical college, Vellore	10.06.2013 to 15.06.2013
4.	M.S.Jeeva Priya & K.S. Abishek	LifeLine Hospital, Perungudi	25.07.2011 to 30.07.2011
5.	Pavithra Murali & P.M.Induja	Billroth Hospital, Chennai	23.05.2011 to 04.06.2011

49. State whether the programme / department is accredited / graded by other agencies? If yes, give details

The Certification Body of TUV SUD South Asia Private Limited certifies that St.Peter's University has established and applies a Quality Management System and fulfilled the ISO 9001: 2008 which is effective from 06-06-2014.

50. Briefly highlight the contributions of the department in generating new knowledge, basic or applied.

Knowledge on Recent trends in modern Medical Instrumentations utilized in the Human Health Care Management by participating in Interdisciplinary seminars and Workshops.

51. Detail five major strengths, Weaknesses, Opportunities and Challenges (SWOC) of the department

Strength:

- Well-equipped Laboratory.
- Modern Class Rooms.
- Highly Qualified staff.
- Updated Syllabus with utility value.
- High placement demand.

Weakness:

- Facilities for the practical application of Instruments.
- Requirements of modern techniques in research activities.
- Interdisciplinary Co-operation.
- Availability of International Publications.

Opportunities:

Plenty of Opportunities in the service sector, sales sector, health care, Research and Development of new Instruments and techniques are available nationally and internationally.

Challenges:

Updating the Curriculum, Teaching methodologies according to the constant change globally.
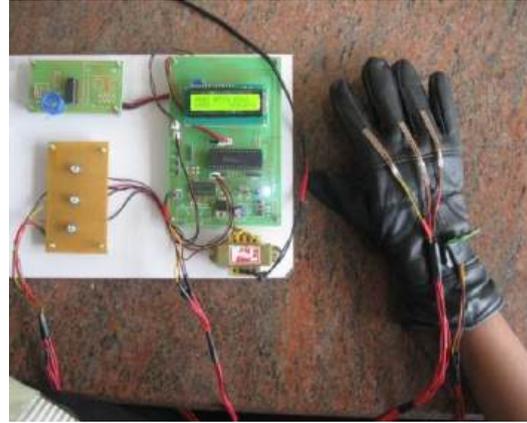
52. Future plans of the department

- To develop a curriculum to suit the recent trends.
- To develop short term certificate courses.
- Development of Income generating projects.
- Modification of the Lab system according to the needs of the above.
- A modern library with latest learning gadgets.

FUNDED MSME PROJECTS

MSME Project – Dumb Assist Device TRANSMITTER

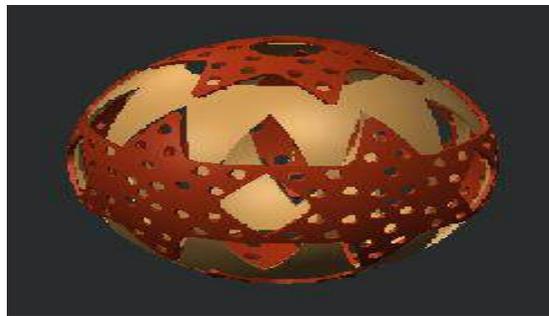**MSME Project –Dumb Assist Device RECEIVER**

Dumb Assist Device – SELF TESTING

Low Cost LED according to room Dimension – MSME Project

Working Model – LED Lamp

Cabinet Model for LED Lamp- Ongoing MSME Project

B.E Final Year Projects

Project Demo- Robotic mask for Facial Paralysis	**Project Explanation –Blood Flow Stimulator for diabetic patients**