

# MANDATORY DISCLOSURE

Mandatory Disclosure by Institutions running AICTE approved Engineering/Technology/Pharmacy programmes to be included in their respective Information Brochure, displayed on their website and to be submitted to AICTE every year latest by 30<sup>th</sup> April together with its URL

**The following information is to be given in the Information Brochure besides being hosted on the Institution's official Website.**

*"The information has been provided by the concerned institution and the onus of authenticity lies with the institution and not on AICTE."*

## I. NAME OF THE INSTITUTION

- Address including telephone, Fax, e-mail.

**University College of Engineering, Burla**  
P.O. Burla Engineering College,  
Dist. Sambalpur (ORISSA)  
Pin – 768 018  
Phone – (0663) 2430211  
Fax - (0663) 2430204  
e-mail – principal\_uceburla@rediffmail.com

## II. NAME & ADDRESS OF THE DIRECTOR

- Address including telephone, Fax, e-mail.  
Prof. Krishna Chandra Singh  
Principal,  
University College of Engineering, Burla  
P.O. Burla Engineering College,  
Dist. Sambalpur (ORISSA)  
Pin – 768 018  
Phone – (0663) 2430211 (O)  
(0663) 2432860 (R)  
Fax - (0663) 2430204 (O)  
e-mail – kcsingh@hotmail.com

## III. NAME OF THE AFFILIATING UNIVERSITY

Biju Patnaik University of Technology, Rourkela, Orissa

## IV. GOVERNANCE

- ❖ Members of the Board and their brief background

The college was a constituent college of Sambalpur University upto June 2002. It is having academic autonomy valid up to 2006. There was a Board of Management for the college consisting of the following members.

1. Minister of Industries, Govt. of Orissa - Chairman
2. Two members to be nominated for a period of two years by Board of Management.
3. Secretary-cum-Commissioner, Finance Dept. Govt. of Orissa

4. Secretary-cum-Commissioner, Industries Department, Govt. of Orissa
5. Two senior most teachers of the college to be nominated on rotation basis according to seniority by the Principal of the college for a period of two years.
6. One nominee of the University
7. Director of Technical Education & Training, Govt. of Orissa
8. One nominee of the University Grants Commission
9. Principal, NIT, Rourkela
10. One nominee of AICTE
11. Principal of the college – Ex-Officio Member-Secretary

Subsequently the college has been transferred to Biju Patnaik University of Technology, Orissa when came into existence in June 2002. The matters relating to the college are discussed in the Board of Management of Biju Patnaik University of Technology. The constitution of Board of Management of Biju Patnaik University of Technology is as follows (vide Clause 17 of the BPUT Act 2002). The University Grants Commission has extended the autonomous status upto the year 2011-12.

17.(1) The Board shall be the chief executive body of the University and shall consist of the following members, namely:

Ex-Officio members:

- (i) the Vice-Chancellor - Chairman
- (ii) the Secretary to Government, Industries Department
- (iii) the Secretary to Government, Finance Department
- (iv) the Secretary to Government, Higher Education Department
- (v) the Secretary to Government, Science and Technology Department
- (vi) the Director of Technical Education and Training

Other members:

- (vii) one person from among Directors/Deans of the University, nominated by the Vice-Chancellor
- (viii) one Principal of any of the affiliated or constituent colleges of the University, nominated by the Vice-Chancellor
- (ix) two members of the Academic Council, elected by the members thereof
- (x) two members of the Orissa Legislative Assembly, elected by the members thereof
- (xi) two persons representing industries, both Private and Public Sectors, nominated by the Chancellor
- (xii) one Professor or Director of a premier technical education /institution like IIT or IIM nominated by the Chancellor
- (xiii) one official representative of the Council nominated by it' and
- (xiv) One member from amongst the members of Governing bodies of affiliated institutions, nominated by the Vice-Chancellor.

(2) The term of office of the members of the Board, other than the ex-officio members, shall be three years from the date of their nomination or election, as the case may be, and they shall not be eligible for re-nomination or re-election for the next consecutive term.

❖ Members of Academic Advisory Body

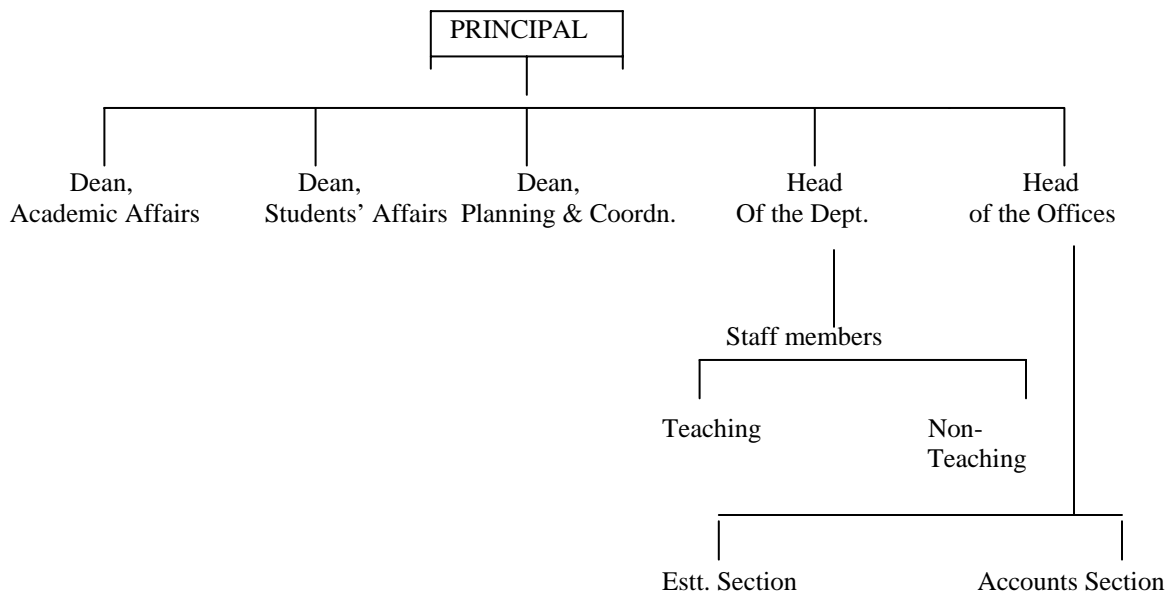
The matters relating to academic affairs is decided in the academic council of the University where the Principals of all the affiliated and constituent colleges are the members. Besides, the college is having academic autonomy up to 2011-12 and the academic committee which has been constituted for the same has the following members.

- (a) Principal of the college - Chairman
- (b) All Heads of the Departments in the College
- (c) One Professor from each of the Departments by rotation for a period of one year according to seniority.
- (d) Two Readers and Two Lecturers of the College by rotation for a period of one year according to seniority.
- (e) Five nominees of the University (One from any IIT, One from NIT, Rourkela, One each from the University representing Science, Humanities and Commerce/Economics to be nominated by the Syndicate.
- (f) One Post-graduate student, Two undergraduate students and one outstanding student sports person to be nominated by the Principal on the basis of merit.
- (g) Officer-in-charge of the Examination of the College - Non-member-Secretary.

❖ Frequency of the Board Meetings and Academic Advisory Body

The Board is used to meet once in three months and Academic Advisory Body at least twice in a year i.e. before starting of odd and even semester.

❖ Organizational chart and processes



❖ **Nature and Extent of involvement of faculty and students in academic affairs/improvements**

The representatives of faculty and students are included in the academic committee which is the advisory body for the academic affairs.

❖ **Mechanism/Norms & Procedure for democratic/good Governance**

All the administrative and account matters are dealt according to the rules and regulations prescribed by Government of Orissa. We have two Officers of the Govt. of Orissa under deputation in Senior Class-I level belonging to Orissa Administrative and Finance Service.

Further, the policy decisions regarding academic affairs are taken in the academic committee where Deans, Heads of departments, senior faculty members and students are members. Other decisions regarding academic matters are taken in the HOD council which includes all Head of departments.

Other matters relating to establishment and accounts are decided through committees consisting of senior Professors and Accounts Officer and Administrative Officer as and when required.

❖ **Student Feedback on Institutional Governance/faculty performance**

The student feedback regarding performance of the faculty are regularly collected and analysed and the same is being conveyed to the faculty members. The copy of the proforma for the student feedback is enclosed.

❖ **Grievance redressal mechanism for faculty, staff and students**

The grievance of the students relating to hostel affairs are redressed through the hostel Superintendents and warden of the Hostels. For common problems relating to hostel affairs are redressed through the Hostel Council consisting of Principal as the Chairman, Warden, Hostel Superintendents and elected representatives of students of each hostel as members.

For matters related to the college the grievances are redressed through the faculty advisor and the concerned Head of the department. Principal is the final decision making authority.

For faculty and staff the grievances are redressed through discussion with the teachers association and non-teaching employees association.

**V. PROGRAMMES**

❖ **Name of the Programmes approved by the AICTE**

UG Programme

Civil Engineering  
Electrical Engineering  
Mechanical Engineering  
Electronics & Telecomm. Engineering  
Computer Science & Engineering  
Manufacturing Science & Engineering  
Information Technology

PG Programme

Hydraulics & Irrigation Engineering  
Structural Engineering  
Transportation Engineering

Power System Engineering  
Machine Design & Analysis  
Heat Power Engineering  
Production Engineering  
Communication Systems  
MCA (Master in Computer Applications)

❖ Name of the Programmes accredited by the AICTE

Sl.No.	Name of Programme (s)	Accreditation Status	Period of validity w.e.f. 27.07.2006
1.	B.Tech. in Mechanical Engineering	Accredited	5 years
2.	B.Tech. in Electrical Engineering	Accredited	5 years
3.	B.Tech. in Civil Engineering	Accredited	5 years
4.	B.Tech. in Electronics & Telecomm. Engg.	Accredited	3 years
5.	B.Tech. in Computer Science & Engg.	Accredited	3 years

*AICTE Letter F.No.NBA/ACCR-765/2004 dated August 28, 2006*

❖ For each Programme the following details are to be given:

Sl.No.	Name	Number of seats	Duration	Cut off mark	Fee (Tuition fee)	Placement Facility
01	Civil Engg	35	04 yrs	Decided by JEE, Orissa	Rs. 10000 p.a	Available
02.	Electrical Engg.	68	04 yrs.	- do -	Rs. 10000 p.a	Available
03.	Mechanical Engg.	69	04 yrs.	- do -	Rs. 10000 p.a	Available
04.	Electronics & TC	35	04 yrs	- do -	Rs. 10000 p.a	Available
05.	Manufacturing Sc.	33	04 yrs	- do -	Rs. 10000 p.a	Available
06.	I.T.	33	04 yrs	- do -	Rs. 20000 p.a	Available
07.	MCA	30	03 yrs	- do -	Rs.20000 p.a.	Available

- Campus placement in last three years with minimum salary, maximum salary and average salary

### 2002-03

Department / Programme	Number of students recruited	Average Salary / annum	Highest salary offered / annum
Civil Engg	00	00	00
Electrical Engg.	03	1,20,000/-	1,56,000/-
Mechanical Engg.	05	1,20,000/-	1,56,000/-
Electronics & Telecomm. Engg.	01	1,20,000/-	1,56,000/-
Computer Science & Engg.	02	1,20,000/-	1,56,000/-
Manufacturing Science & Engg.	01	1,20,000/-	1,56,000/-

### 2003-04

Department / Programme	Number of students recruited	Average Salary / annum	Highest salary offered / annum
Civil Engg	05	1,68,000/-	1,92,000/-
Electrical Engg.	28	1,68,000/-	1,92,000/-
Mechanical Engg.	29	1,68,000/-	1,92,000/-
Electronics & Telecomm. Engg.	23	1,68,000/-	1,92,000/-
Computer Science & Engg.	18	1,68,000/-	1,92,000/-
Manufacturing Science & Engg.	08	1,68,000/-	1,92,000/-
MCA	02	1,68,000/-	1,92,000/-

### 2004-05

Department / Programme	Number of students recruited	Average Salary / annum	Highest salary offered / annum
Civil Engg	04	1,92,000/-	2,22,000/-
Electrical Engg.	38	1,92,000/-	2,22,000/-
Mechanical Engg.	34	1,92,000/-	2,22,000/-
Electronics & Telecomm. Engg.	18	1,92,000/-	2,22,000/-
Computer Science & Engg.	14	1,92,000/-	2,22,000/-
Manufacturing Science & Engg.	03	1,92,000/-	2,22,000/-
MCA	03	1,92,000/-	2,22,000/-

- ❖ Name and duration of programme(s) having affiliation/collaboration with Foreign University(s)/Institution(s) and being run in the same Campus along with status of their AICTE approval. If there is foreign collaboration, give the following details:

NOT APPLICABLE

Details of the Foreign Institution/University:

- Name of the University/Institution
- Address
- Website
- Is the Institution/University Accredited in its Home Country
- Ranking of the Institution/University in the Home Country
- Whether the degree offered is equivalent to an Indian Degree? If yes, the name of the agency which has approved equivalence. If no, implications for students in terms of pursuit of higher studies in India and abroad and job both within and outside the country.
- Nature of Collaboration
- Conditions of Collaboration
- Complete details of payment a student has to make to get the full benefit of collaboration.

- ❖ For each Collaborative/affiliated Programme give the following: NOT APPLICABLE

- Programme Focus
  - Number of seats
  - Admission Procedure
  - Fee
  - Placement Facility
  - Placement Records for last three years with minimum salary, maximum salary and average salary
- ❖ Whether the Collaborative Programme is approved by AICTE? If not whether the Domestic/Foreign Institution has applied to AICTE for approval as required under notification no. 37-3/Legal/2005 dated 16<sup>th</sup> May, 2005

## VI. FACULTY

- ❖ Branch wise list faculty members:

Branch	Permanent Faculty		Visiting /Faculty	Guest Faculty	Adjunct Faculty
	Sactioned	Actual			
Civil Engg.	15	08	00	00	01
Elect. Engg.	20	11	00	00	02
Mech. Engg.	20	14	00	00	01
El.&TC Engg	14	09	00	00	02
Comp.Sc.	06	06	00	00	02
Mfg.Sc.	04	03	00	00	00
I.T.	00	00	00	00	03
MCA	00	00	00	00	03
Humanities	01	01	00	00	03
Social Sciences	13	09	00	00	01

- Permanent Faculty: Student Ratio 1: 20
- ❖ Number of faculty employed and left during the last three years

No. of faculty employed - Regular – 25  
 Contractual - 32  
 No. left - Regular - 06

## VII. PROFILE OF DIRECTOR/PRINCIPAL WITH QUALIFICATIONS, TOTAL EXPERIENCE, AGE AND DURATION OF EMPLOYMENT AT THE INSTITUTE CONCERNED

Name : Dr. Krishna Chandra Singh

Age : 59 years

Total Experience : 33 years

Academic qualifications (with field of specialization)

B.Sc. (Engg.) Hons in Mechanical Engg. (UCE, Burla), 1969

M.Tech. (IIT, Kharagpur) (Machine Design), 1972

Ph.D. (Engg.) (IIT, Kharagpur) (Tribology), 1983

Membership of Professional bodies :

- (i) Life Member, Institute of Engineers (I)
- (ii) Life Member, ISTE

Details of Experience (Academic / Industrial) :

Lecturer in Mech. Engg. at UCE, Burla in June, 1972  
Reader in Mech. Engg. at UCE, Burla in March, 1985  
Professor in Mech. Engg. at IGIT, Sarang in Feb., 1988  
Officiating as Principal, IGIT, Sarang from April 1999 to Sept, 1999  
Director of Examinations, BPUT, Orissa in Feb., 2003  
Principal, UCE, Burla from March, 2004  
Conducted JEE, Orissa as Chairman during 1992, 2003 and 2004.  
Guided two Ph.Ds scholars  
Published more than 40 research papers in International and national journals  
Worked as an Expert member of AICTE  
Reviewed papers for International Journals of Wear & Engineering Tribology  
Date of the appointment in the present institution : 31.03. 2004

For each Faculty give a page covering (Attached separately)

1. Name
2. Date of Birth
3. Educational Qualification
4. Work Experience
  - Teaching
  - Research
  - Industry
  - Others
5. Area of Specializations
6. Subjects teaching at Under Graduate Level  
Post Graduate Level
7. Research guidance
  - Masters's - No. of papers published in
  - Ph.D. - National Journals
  - International Journals
  - Conferences
8. Projects Carried out
9. Patents
10. Technology Transfer
11. Research Publications
12. No. of Books published with details

**Photograph**

**Signature**

### VIII. FEE

❖ Details of fee, as approved by State fee Committee, for the Institution.

Tuition Fees	-	Rs. 10,000/- per annum
Development Fees	-	Rs. 6,000/- per annum
Caution money (refundable)		Rs. 2,500/- (One time)

- ❖ Time schedule for payment of fee for the entire programme.

Fees are collected in semesterwise i.e. at the time of registration to a semester.

- ❖ No. of Fee waivers granted with amount and name of students.

12.5% of the students strength

- ❖ Number of scholarship offered by the institute, duration and amount

- 1) Merit Scholarship - Rs. 100 p.m. every year
- 2) Merit-cum-Means - Rs. 100 p.m. + free tuition fees
- 3) Free Studentship - Free tuition fees

- ❖ Criteria for fee waivers/scholarship : Annual income of the parent & academic performance.

- ❖ Estimated cost of Boarding and Lodging in Hostels.

Hostel seat rent	- Rs. 3,600 per annum (single seated)
(including electricity & water charges)	Rs. 3,000 per annum (double seated)
	Rs. 2,400 per annum (triple seated)
	Rs. 1,800 per annum (dormitory)
Boarding charges	- Rs. 10,000/- per annum (approx.)

#### IX. ADMISSION

- ❖ Number of seats sanctioned with the year of approval.

Sl.No.	Name	Number of seats sanctioned	Year of approval
01	Civil Engg	35	1 <sup>st</sup> – 1993 valid – 2006
02.	Electrical Engg.	68	1 <sup>st</sup> – 1993 valid – 2006
03.	Mechanical Engg.	69	1 <sup>st</sup> – 1993 valid – 2006
04.	Electronics & TC	35	1 <sup>st</sup> – 1993 valid – 2006
05.	Manufacturing Sc.	33	1 <sup>st</sup> – 1996 valid – 2006
06.	I.T.	33	1 <sup>st</sup> – 2001 valid – 2006
07.	MCA	30	1 <sup>st</sup> – 1993 valid – 2006

- ❖ Number of students admitted under various categories each year in the last three years.

	Branch	2005	2004	2003
UG(FT)	Civil	35	35	35
	Elect.	68	68	68

	Mech.	69	69	69
	EI & TC	35	35	35
	Comp.Sc	34	34	34
	Mfg.Sc.	33	33	33
	I.T.	33	33	-
PG(FT)	Hyd. & Irr. Engg	00	00	07
	Structural Engg.	00	00	00
	Transpo- tion Engg	00	00	00
	Power System	02	04	04
	Machine Design	00	00	00
	Heat Power	00	00	00
	Productio n Engg.	04	00	04
	Comm. System	05	03	06
	MCA	30	30	30

- ❖ Number of applications received during last two years for admission under Management Quota and number admitted.

Since this is a Government college there is no management quota. All the seats are filled up through central counselling conducted by JEE.

## X. ADMISSION PROCEDURE

- ❖ Mention the admission test being followed, name and address of the Test Agency and its URL (website).

A Common Admission Test (Joint Entrance Examination, Orissa) conducted under the supervision of Govt. of Orissa through a committee headed by the Principal Secretary, Industries Department, Govt. of Orissa.

- ❖ Number of seats allotted to different Test Qualified candidates separately [AIEEE/CET (State conducted test/University tests)/Association conducted test]

All the students are selected from JEE merit list through Central Counselling conducted by JEE, Orissa.

- ❖ Calendar for admission against management/vacant seats: NOT APPLICABLE
  - Last date for request for applications.
  - Last date for submission of application.
  - Dates for announcing final results.
  - Release of admission list (main list and waiting list should be announced on the same day)
  - Date for acceptance by the candidate (time given should in no case be less than 15 days)
  - Last date for closing of admission.
  - Starting of the Academic session.
  - The waiting list should be activated only on the expiry of date of main list.
  - The policy of refund of the fee, in case of withdrawal, should be clearly notified.

## **XI. CRITERIA AND WEIGHTAGES FOR ADMISSION**

- ❖ Describe each criteria with its respective weightages i.e. Admission Test, marks in qualifying examination etc.

The admission is made according to the merit list prepared by Joint Entrance Examination Committee based purely on the performance of candidate in the Joint Entrance Examination.

- ❖ Mention the minimum level of acceptance, if any.

Merit list is prepared approximately double the number of seats to be filled up.

- ❖ Mention the cut-off levels of percentage & percentile scores of the candidates in the admission test for the last three years.

The cut-off levels of percentage and percentile scores are decided by the Joint Entrance Examination committee based on the number of candidates applied and number of seats to be filled up.

- ❖ Display marks scored in Test etc. and in aggregate for all candidates who were admitted.

The list of candidates admitted during 2005 showing their JEE rank is enclosed.

**Item No I - XI must be given in information brochure and must be hosted as fixed content in the website of the Institution.**

**The Website must be dynamically updated with regard to XII–XV.**

THE ABOVE INFORMATION ARE GIVEN IN JEE WEBSITE WWW.JEE2005.ORG

## **XII. APPLICATION FORM**

- ❖ Downloadable application form, with online submission possibilities.

Since the application form is compiled by machine OMR seat is provided to the candidates along with other details.

## **XIII. LIST OF APPLICANTS**

- ❖ List of candidates whose applications have been received along with percentile/percentage score for each of the qualifying examination in separate categories for open seats. List of candidates who have applied along with percentage and percentile score for Management quota seats.

It is being taken up by Joint Entrance Examination.

## **XIV. RESULTS OF ADMISSION UNDER MANAGEMENT SEATS/VACANT SEATS**

- ❖ Composition of selection team for admission under Management Quota with the brief profiles of members (This information be made available in the public domain after the admission process is over)

It is being taken up by Joint Entrance Examination.

- ❖ Score of the individual candidates admitted arranged in order of merit.

It is being taken up by Joint Entrance Examination.

- ❖ List of candidates who have been offered admission.

It is being taken up by Joint Entrance Examination.

- ❖ Waiting list of the candidates in order of merit to be operative from the last date of joining of the first list candidates.

It is being taken up by Joint Entrance Examination.

- ❖ List of the candidates who joined within the date, vacancy position in each category before operation of waiting list.

It is being taken up by Joint Entrance Examination.

## XV. INFORMATION ON INFRASTRUCTURE AND OTHER RESOURCES AVAILABLE

### LIBRARY:

- Number of Library books/Titles/Journals available (programme-wise)
  - No. of Library Books - 55,887
  - No. of titles - 27,500
  - No. of Journals - 26 (National)  
09 (International)
- List of online National/International Journals subscribed.
  - The following e-journal shall be extended to the users through DELNET
  - 1) IEL online
  - 2) ASCE
  - 3) ASME
  - 4) JET
- E-Library facilities
  - Necessary initiatives have already been taken to provide e-library facility in the beginning of January, 2006.

### LABORATORY:

For each Laboratory

- List of Major Equipment/Facilities
- List of Experimental Setup

### COMPUTING FACILITIES:

- Number and Configuration of Systems : 290 Nos. (P-IV, P-III & others)
- Total number of systems connected by LAN : 50 Nos.
- Total number of systems connected to WAN : 80 Nos.
- Internet bandwidth : Leased line (2 Mbps)
- Major software packages available : Linux, Window XP
- Special purpose facilities available : Internet, Networking Lab, Windows Application Lab & Web technology Lab.

### WORKSHOP:

- List of facilities available.
  - (a) Machine Shop
  - (b) Turning Shop
  - (c) Fitting Shop
  - (d) Carpentry Shop
  - (e) Welding Shop
  - (f) Blacksmith Shop
  - (g) Foundry Shop

#### Games and Sports Facilities

- (i) Football fields and Cricket ground,
- (ii) A 400metre and 200metre track for athletics
- (iii) Floodlit Volley Ball and basketball ,
- (iv) Badminton Court and Tennis court .
- (v) State of the art Gymnasium is also available for the students.

#### Extra Curriculum Activities

Different Societies, Clubs and Associations are conducting various Events under extra curricular activities

#### Soft Skill Development Facilities

Language Lab. Under process

Number of Classrooms and size of each

22 Nos. of 110 sq.m. size

Number of Tutorial rooms and size of each

05 Nos. of 140 sq.m. size

Number of laboratories and size of each

51 Nos. of 120 sq.m. size

Number of drawing halls and size of each

05 Nos. of 200 sq.m. size

Number of Computer Centres with capacity of each

Central facility 3 Nos. with 50 each having internet connection and network Facility.

Central Examination Facility, Number of rooms and capacity of each.

4 rooms are available for the purpose.

Teaching Learning process

Class room teaching

Through electronic media using Edusat

Through special invited lectures by experts from industries, other eminent professors from IITs, NIT and sister institutes.

- Curricula and syllabi for each of the programmes as approved by the University.
- Academic Calendar of the University : Attached separately
- Academic Time Table : Attached separately
- Teaching Load of each Faculty : Attached separately
- Internal Continuous Evaluation System and place : 3 Nos. of Class test during each semester
- Students' assessment of Faculty, System in place. : Attached separately

## INFORMATION ABOUT POST GRADUATE PROGRAMMES

IN

### ENGINEERING & TECHNOLOGY

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- i) **M. Tech. In Hydraulics & Irrigation Engineering**
- M. Tech. In Structural Engineering**
- M. Tech. In Transportation Engineering**

- ii) Curricula and Syllabi As approved by BPUT
- iii) Faculty Profile

SI	Name	DESIGNATION	Subject Teaching
1.	Dr. A.N.Nayak	Professor	Structural Engg
2.	Dr. P.C.Swain	Reader	Water Resources Engg.
3.	Dr. P.K.Das	Reader	Water Resources Sys. Engg.
4.	Mrs. S.Rath	Sr. Lect.	Transportation Engg.
5.	Sri S.K.Panigrahi	Lect.	Structural Engg.
6.	Sri D.P.Satpathy	Lect.	Water Resources Engg.

- Brief profile of each faculty.
- Laboratory facilities exclusive to the PG programme

- (a) Hydraulics Flow Laboratory
- (b) Highway Engineering Laboratory
- (c) Structural Engineering laboratory
- (a) Concrete Laboratory
- (b) Survey Laboratory

**I. MASTER OF TECHNOLOGY IN ELECTRICAL ENGINEERING  
(SPECIALISATION IN POWER SYSTEM ENGINEERING)**

**II. CURRICULA AND SYLLABI**

1st M.Tech-November (Electrical Engg.)	Lecture	Tutorial	Practical	Credit
Power System Analysis	3	1	0	4
EHV AC Transmission	3	1	0	4
Power Apparatus and System	3	1	0	4
Electric Drive Systems	3	1	0	4
Project Management	3	0	0	3
Power System Lab-I	0	0	6	4
Seminar-I	0	0	3	2
Comprehensive Viva Voce-I				3
<b>2nd Semester (May)</b>				
Power System Operation & Control	3	1	0	4
Power System Dynamics	3	1	0	4
HVDC & Facts	3	1	0	4
Digital Signal Processing	3	1	0	4
Optimisation Techniques	3	0	0	3
Power System Lab-II	0	0	6	4
Seminar-II	0	0	3	2
Comprehensive Viva Voce-II				3

**1<sup>ST</sup> SEMESTER SYLLABI**

**POWER SYSTEM ANALYSIS**

Introduction: An overview of system modeling and analysis. Modeling of transmission line and transformer with off-nominal taps.

Solution Techniques: Sparse matrix technique for large, scale system problems, Gauss elimination and Bifactorization method.

Short Circuit Studies: Symmetrical fault analysis using Y bus, single phase and three phase impedance form, unsymmetrical fault analysis using symmetrical components.

Power Flow Analysis: Newton's method and Fast decoupled method, contingency analysis using FDLF method, Multi-area power flow analysis.

Generation System Reliability Analysis: Probabilistic generation and load models determination of LOLP and expected value of demand not served, determination reliability of isolated and interconnected generation systems.

Transmission System Reliability Analysis: Deterministic contingency analysis, probabilistic load flow, fuzzy load flow, probabilistic transmission system reliability analysis, determination of reliability indices like LOLP and expected value of demand not served.

**BOOKS:**

Stagg G.W., El. Abiad A.H., "Computer Methods in Power System Analysis", MGH.

Elgerd O.I., "Electrical energy Systems theory: An Introduction", TMGH

Billington & Allan Ronald, "Power System reliability".

Nagrath & Kothari, "Modern Power System Analysis".

**EXTRA HIGH VOLTAGE A.C. TRANSMISSION SYSTEM**

Introduction of EHV Transmission Comparison of AC and DC Transmission systems.

Parameters of EHV Lines: Resistance of conductors, bundle conductors, Inductance of EHV Line configurations Line capacitance calculation, Sequence Inductance and capacitance, Line parameters for modes of propagation, Resistance and Inductance of Ground returns.

Voltage Gradient of Conductors: Field of sphere gap, field of line charges and their properties, charge-potential relations for multi-conductor lines surface voltage gradient and conductors without and with ground wires consideration, gradient factors, Distribution of voltage gradient on sub-conductors of bundle.

Corona effects-I: Power loss and Audible Noise. Corona loss, Charge-voltage diagram, attenuation of travelling waves Audible.

Noise: Generation, Characteristics and its limitation, Measurement, meters, 1-ph and 3-ph AN levels, Day-Night equivalent Noise level.

Power Frequency Voltage Control and Over-Voltage: Generalized constants, Cascade connection of components-shunt and series compensation, sub-synchronous resonance in series-capacitor compensated lines, Static Reactive compensating systems.

Over Voltage in EHV Systems Caused by Switching Operations: Origin of over voltages and their types, Short circuit current and circuit breaker, Recovery voltage and the circuit breaker, Over voltages caused by interruption of low inductive current, Interruption of capacitive currents, Ferroresonance Over voltage, Calculation of Switching surges – single phase equivalents, Distributed parameter line energized by source, Generalized equations for single phase representation, Generalized equations for three phase systems, Inverse Fourier transform for the general case, Reduction of switching surges on EHV systems, Experimental and calculated results of switching surge studies.

Books: "Extra High Voltage A.C. Transmission" By R.D.Begamudre

**POWER APPARATUS AND SYSTEMS**

Synchronous Machines: The basis of General theory and generalized Equation of A.C. machines, equations in terms of phase variables, Park's transformation, Various reference frames, Derivation of two-axis equations, torque equation, Field and damper windings, Simplified equation of synchronous machine with two damper windings, Equivalent circuits, Operational impedances and frequency response loci, Modified equation with more accurate coupling between field and damper windings.

Synchronous Generator Short Circuit and System Faults: Symmetrical short circuit of unloaded generator, analysis of short circuit oscillograms, short circuit of loaded synchronous generator, Unsymmetrical short circuit of synchronous generator, System fault calculation, Sudden load changes, Equivalent circuit under transient condition, Constant flux linkage theorem, simplified phasor diagram for transient changes.

Selected topics on Excitation Systems: Modeling of excitation system components, Exciter (D.C. and A.C), Amplifier, Stabilizing circuit.

Selected Topics on Prime Mover and energy Supply Systems: Governors for hydraulic and steam turbines, Transient droop, Speed governing system.

Induction Machines: General equations of the induction motor (Park's and Kron's equations), application of equations in primary and secondary reference frames and complex form of equations, short circuit and fault currents due to the induction motor.

Transformers: Transient phenomena in transformer and transformer protection: General characteristics of over voltage and current inrush, Transient over voltage characteristics, Ferro resonant over voltage, Protection against surges and insulation co-ordination.

#### BOOKS RECOMMENDED:

The Generalized theory of Electrical Machines (Chapters: 1, 2, 4, 5, 8 and 11) By B. Adkins and R.H. Hoorley.

Principle, Operation and Design of Power Transformer By S.B.Vascitinsky.

The J & P Transformer Book (Chapters: 22 & 23) By S.Austen Stigant and A.C.Franklin.

Power System Stability & Control (Chapters : 8 & 9) By P.Kundur, McGraw Hill 1994.

#### **ELECTRIC DRIVE SYSTEMS**

Principles of Adjustable-speed AC Drives: Selecting an adjustable-speed drive, Constant Volts/hertz operation, Generation of adjustable-frequency AC power, Adjustable-frequency operation of AC motors, Fundamentals of electric drives.

Adjustable-frequency Induction Motor Drivers: Constant terminal Volts/hertz operation and control, Constant air gap flux operation and control, Controlled current and slip operation, Constant horse power operation, Current source inverter drive, current controlled PWM inverter drive, Air gap and torque control, Transient analysis of induction motor behavior, field-oriented control, Implementation of field-oriented control.

Adjustable-frequency Synchronous Motor Drivers : Steady-state theory of operation, Adjustable-frequency operation, Principle of synchronous motor control, Self-controlled synchronous motor, Current-fed self-controlled synchronous motor, Torque angle control synchronous motor, Servo control of the permanent magnet synchronous motor.

Simulation of Power Electronics and Drive Systems: Representation of switching action using PSpice, Thyristor converter representation using EMTP, Simulation examples of induction motor drive systems using PSpice, MATLAB/SIMULINK and EMTP.

Control of power Electronics and Drives using Microprocessors and digital ICs: Microcomputer control of power electronic systems, ASICs for control of power electronic systems, Application examples of digital control of induction and synchronous motor drives.

Fuzzy Logic and Neural Networks in Power Electronics and Drives: Fuzzy logic principles, Fuzzy control, Modeling and estimation, Design methodology and control implementation, application example of induction motor efficiency optimization control. Neural network principles, Fuzzy neural network, Design methodology and implementation, Application in power electronics and drives: Estimation of distorted wave, Drive feedback signal estimation, and Flux observer for induction motor drive.

#### BOOKS RECOMMENDED:

Power Electronic Control of AC Motors (Chapters: 1, 7 and 8) By J.M.D.Murphy and F.G.Turnbull, Pergamon Press, Great Britain, 1989.

Power Electronics and Variable Frequency Drives: Technology and Applications (Chapters: 8,10 and 11) By Bimal K. Bose, Standard Publishers Distributors New Delhi, 2000.

#### MODELING AND SIMULATION

Basic simulation modeling, modeling of complex systems, Simulation software, review of basic probability and statistics Building valid and credible simulation models, selecting input probability distributions, Random number generators and output data analysis for a single system, Statistical techniques for comparing alternative systems, Variance reduction techniques, Experimental design and optimization, Bond Graphs for simple electrical and mechanical systems modeling and simulation of hydraulic thermal, and manufacturing systems.

BOOKS Verill Law A and Kelton D. M., "Simulation Modelling and Analysis". Mc Graw Hill

Mukherjee A and Karmakar R. "Modelling and Simulation of Engineering Systems through Bond Graphs" Narosa Publishing House, CRC Press.

#### PROJECT MANAGEMENT

Project Feasibility Analysis: Technical, feasibility, commercial and financial viability Environment Analysis.

Project Engineering: Project Management, Techniques: PERT, CPM, Project Scheduling, Crashing, PERT/COST, LOB.

Project Financing alternatives, sources of finance, their advantages and disadvantages, choice of financing mix. Capital budgeting.

Costing: Fixed and variable cost. Breakeven analysis, Overhead allocation techniques.

Project organisation, management and control: Project organisation and control Staffing, monitoring: cost time and control and progress monitoring techniques.

Product and service pricing : Availability and quality based pricing for services.

Capacity planning and expansion Capacity Decision Considerations and models.

## BOOKS

Prasanna Chandra : Project Engineering and Management Prentice Hall.

Levy and Weist: Management guide to PERT/CPM Prentice Hall.

### **POWER SYSTEM LAB-I**

Evaluation of transmission line performance.

Series capacitor compensator.

Shunt capacitor compensator.

Development of power circle diagram.

Computation of optimum dispatch of generation.

Power flow solution by Newton-Raphson method. Power flow solution by Fast Decoupled method.

Power system fault analysis.

DC power flow contingency analysis.

Z-matrix method for contingency analysis.

Double frequency transients.

Computation of critical clearing time for fault. Finding out maximum steady state power by using equal area criteria. Development of swing curve for single machine infinite bus system. Transient stability analysis.

### **SECOND SEMESTER**

#### **POWER SYSTEM OPERATION AND CONTROL**

Automatic Generation and Voltage Control: Modeling of alternator and turbo generator, turbine and generator load frequency scheme, steady state and dynamics analysis of frequency domain for single and two area systems, Megavar voltage control problem, state variable model and plant control strategies for large interconnected systems.

Optimal System Operation: Generator allocation problem formulation, loss coefficients, economic dispatch with incremental transmission loss derived from jacobian or load flow solution, introduction to non-linear programming methods to minimize cost functions, combined coordination of hydro thermal and hydro nuclear stations.

Reactive Power Control Problem: Formulation, linear and non-linear models, L.P. based solution of reactive power problem. Unit Commitment: Constraints in unit commitment, Unit commitment solution methods.

#### BOOKS RECOMMENDED

Electric Energy Systems Theory By O.I.Elegerd.

Power System Operation and Control By P.S.R.Murty.

Power Generation, Operation and Control By A.J.Wood and B.F. Wollenberg.

#### **POWER SYSTEM DYNAMICS**

Power System Stability Problems: Basic concepts and definitions, rotor angle stability, Synchronous machine characteristics, Power versus angle relationship, Stability phenomena, Voltage stability and voltage collapse, Mid-term and long-term stability, Classification of stability.

Small Signal Stability: State-space concepts, Basic linearization technique, Participation factors, Eigen properties of the state matrix, small signal stability of a single-machine infinite-bus system, Studies on Parametric effects: effect of loading effect of  $K$ , effect of type of load, Hopf-bifurcation, Electromechanical oscillating modes, Stability improvement by power system stabilizers, Design of power system stabilizers.

Energy Function Methods: Physical and mathematical aspects of the problem, Lyapunov's method, Modeling issues, Energy function formulation, Potential energy Boundary, Surface (PEBS): Energy function for a single machine infinite-bus system, equal area criterion and the energy function, Multimachine PEBS.

Sub Synchronous Oscillations: Turbine generator torsional characteristics, Shaft system model, Torsional natural frequencies and mode shapes, Torsional interaction with power system controls: interaction with generator excitation controls, interaction with speed governors, interaction with nearby DC converters, Sub synchronous resonance (SSR) : characteristics of series capacitor – compensated transmission systems, self-excitation due to induction generator effect, torsional interaction resulting in SSR, Analytical methods Countermeasures to SSR problems.

#### BOOKS RECOMMENDED

Power System Stability and Control (Chapters : 2,12 and 15) by P.Kundur, McGraw Hill Inc., 1994

Power System Dynamics and Stability (Chapters 8 and 9) by P.W.Sauer and M.A.Pai, Pearson Education, Second Indian Reprint, 2003.

#### **HDVC & FACTS**

Introduction to HDVC: Comparison of AC-DC transmission, Description and application of HDVC transmission, DC system components and their functions.

Analysis of HDVC Converters: Pulse number, converter configuration, analysis greatz circuit, bridge characteristics, 12 pulse converter.

HDVC System Control: Principles of DC Link control, converter control characteristics, system control, firing angle control, current and excitation angle control, DC link power control, higher level controllers, reactive power control and VAR sources, Multi terminal DC system, types, control and protection, DC circuit breakers.

FACTS: Basic concepts, thyristor controlled devices, converter based devices, modeling and control of SVC, TCSC, STATCOM and SSC.

Unified Power Flow Control: Introduction, Implementation of power flow control using conventional thyristors, Unified power flow concept, Implementation of unified power flow controller.

#### BOOKS RECOMMENDED

Padiyar K.R., "HDVC Power Transmission System", Wiley Eastern Pvt. Limited, 1980.

Kimbark, "Direct Current Transmission", Vol.1.,John Wiley, New York, 1971.

Arrillaga J., "High Voltage Direct Current Transmission", Peter Peregrinus

Hingorani G., "Understanding FACTS by Narin", IEEE Press, 1999.



Digital Signal Processing – A.V.Oppeinheim & R.W.Schafer, PHI of India, 1988.

Digital Signal Processing R.Rabiner and B.Gold, PHI, 1992.

Introduction to Digital Signal Processing, Johny R.Johnson and Application of PHI, 1994.

Digital Signal Processing by Johnson & Johnson PHI.

### **OPTIMIZATION TECHNIQUES**

Optimization Fundamentals: Definition, Classification of Optimization problems, Unconstrained and Constrained optimization, Optimality conditions.

Linear Programming: Simplex Method, Duality, Sensitivity methods.

Nonlinear Programming: Powel's method, Steepest descent method, Conjugate gradient method, Newton's method, GRG method, sequential quadratic programming Penalty function method, Augmented Lagrange multiplier method.

Dynamic Programming & Integer Programming

Interior Point Methods: Karmakar's algorithm, Dual affine, Primal affine, Barrier algorithm.

Modern Techniques: Simulated annealing, Evolutionary programming, Genetic algorithm & Genetic Engineering.

Finite Element Based Optimization

### **REFERENCE BOOKS**

Ashok D.Belegundu & Charandrupatla T. R., "Optimization Concept & Applications in Engineering", Prentice Hall, 1999.

Rao S.S., Engineering Optimization".

Gill, Murray & Wright., "Practical Optimization".

James A. Momoh, "Electric Power System Application of Optimization".

Song Y. H., "Modern Optimization Techniques in Power Systems".

### iii.Faculty Profile for PG Course

<b>Sl.No.</b>	<b>Name</b>	<b>Designation</b>	<b>Subject teaching</b>
1	<b>Dr.S.K.Sanyal</b>	Professor	Power System Analysis, Power System Operation & Control
2	<b>Dr.M.Panda</b>	Professor	Power Apparatus System, HVDC & Facts
3	<b>Dr.B.B.Pati</b>	Professor	EHV AC Transmission
4	<b>Dr.P.K.Hota</b>	Professor, (T&P)	Power System dynamics, Electric Drives
5	<b>Dr.S.Behera</b>	Reader	Electric Drives, HVDC & Facts
6	<b>Dr.P.K.Modi</b>	Reader	Optimisation Techniques

### Publications from Masters Projects

- [1] B.K.Panigrahi, P.K.Hota and S.Dash, "Power Quality Analysis using Phase Corrected Wavelet Transform (PCWT)", Paper accepted and will be appeared in an upcoming issue of Iranian Journal of Electrical and Computer Engineering-2004.
- [2] P.K. Dash, B. K. Panigrahi, D. K. Sahoo and G. Panda, " Power Quality Disturbance Data Compression, Detection & Classification Using Integrated Spline Wavelet and S- Transform", IEEE Trans. On Power Delivery, Vol. 18 , No. 2 ,April 2003.

- [3] S.Mishra, P.K.Hota, and P.K.Mohanty “Design of an Intelligent UPFC for Improving Transient Stability Performance”, Journal of Institution of Engineers (India), pt.EL, Vol. 84, December-2003, pp 148-153.
- [4] D.K.Biswal “ Reactive Power Management Through FACTS Devices” proceedings of Resonance-2005 U.C.E., Burla.
- [5] R.C.Das “Current Operational Problems of Interconnected Power Systems” proceedings of Resonance-2005 U.C.E., Burla.
- [6] S.Samal “ Power System Stabilizer Design” proceedings of Resonance-2005 U.C.E., Burla.
- [7] N.Sahoo “Experience with Harmonics in Indian Power System” proceedings of Resonance-2005 U.C.E., Burla.
- [8] L.D.Samanta Power System Optimisation under Deregulation Environment” proceedings of Resonance-2005 U.C.E., Burla.
- [9] S.Behera “An Intelligent Approach for Fault Classification of a Transmission line using Wavelet” proceedings of Resonance-2005 U.C.E., Burla.

### **LABORATORY FACILITIES EXCLUSIVE TO THE PG PROGRAMME**

#### **Labs used by PG Students**

Soft Computing Laboratory  
 DSP & Embedded System Laboratory(Exclusive for PG classes)  
 Computational Laboratory  
 Power Electronics & Devices Laboratory  
 Power System Laboratory

#### **Major Equipments (For PG Classes)**

- 1.100mA, High Voltage Shering Bridge for Capacitance and tan delta measurement
- 2.2-stage 0.49KJ, 280 kV DC, 140 kV Impulse Generator test set with all accessories.
- 3.100MHz 500Ms/s Digital storage Oscilloscope for impulse Voltage Measurement
- 4.100kV AC High Voltage transformer for testing of Line insulators, bushings etc.
- 5.MATLAB Software with tool boxes Real Time workshop, Simulink, Neural Network and Fuzzy logic.
- 6.SCADA Trainer Digital Module
- 7.Programmable Logic Control Trainer

**i. M. Tech. In Production Engineering**  
**M. Tech. In Heat Power Engineering**  
**M. Tech. In Machine Design & Analysis**

- ii. Curricula and Syllabi As approved by BPUT  
 iii. Faculty Profile  
 iv.

SI	Name	DESIGNATION	Subject Teaching
1.	Dr. R.K.Bhoi	Professor	Production Engineering
2.	Dr. J. Rana	Reader	Production Engineering
3.	Dr. B.B.Pani	Sr. Lect.	Production Engineering
4.	Dr. I.Padhy	Professor	Thermal Engineering
5.	Sri. S.B.Mohapatra	Reader	Thermal Engineering
6.	Sri P.Nanda	Sr. Lect.	Thermal Engineering
7.	Dr. S.K.Sar	Professor	Machine Design
8.	Dr. J.L.Dwari	Reader	Machine Design
9.	Dr. P.R.Dash	Reader	Machine Design

- Brief profile of each faculty.
- Laboratory facilities exclusive to the PG programme
  - (c) Production Engineering (Flexible Mfg. System & Robotics Lab.)
  - (d) Thermal Engg. (Heat Transfer Lab.)
  - (e) Design & Analysis (Stress Analysis, Tribology, Composite Material lab.)

**i. M.Tech. in Communication Systems Engg**

- ii. Curricula and Syllabi :

Semester wise details of Course structure for M.TECH (CSE)

FIRST SEMISTER M.TECH.(CSE)					3	1	3/6	
1.	Modern Digital Communication Techniques	C	6	EL&TCE	3	1	0	
2	Project Management	C	6	Mechanical	3	1	0	
3	Information Theory And Coding	C	6	EI & TCE	3	1	0	
4	Advanced Digital Signal Processing	E	6	EI & TCE	3	1	0	
5	Advanced Microprocessor	E	6	EI & TCE	3	1	0	
6	Design and Simulation Laboratory	C	6	EI & TCE	0	0	3	
7	Telecommunication Systems Engg. Lab-1	C	6	EI & TCE	0	0	3	
8	Comprehensive Viva-voce-1	C	6	EI & TCE	0	0	3	

9	Seminar-1	C	6	EL&TCE	0	0	3	
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SECOND SEMISTER M.TECH.(CSE)					3	1	3/6	
1.	Mobile Communication	C	6	EL&TCE	3	1	0	
2	Telecommunication Switching Network	C	6	EL&TCE	3	1	0	
3	Internet Technology	E	6	EI & TCE	3	1	0	
4	Fiber optics & Satellite Communication	C	6	EI & TCE	3	1	0	
5	Computational Intelligence	E	6	EI & TCE	3	1	0	
6	Design And Simulation Lab-2	C	6	EI & TCE	0	0	3	
7	Telecommunication Systems Engg. Lab-2	C	6	EI & TCE	0	0	3	
8	Comprehensive Viva-voce-2	C	6	EI & TCE	0	0	3	
9	Seminar-2	C	6	EL&TCE	0	0	3	

THIRD & FOURTH SEMISTER M.TECH.(CSE)- THESIS WORK.

iii. Faculty Profile

SI	Name	DESIGNATION	Subject Teaching
1.	Dr. R.Panda	Professor	ADSP, Mobile communication
2.	Dr. NGPC Mahalik	Reader	Distributed Control
2.	Dr.U.R.Jena	Reader	MDCT, Web Technology
3.	Dr.N.P.Rath	Sr. Lecturer	DIP, IT
4.	Mr. M.R.Pradhan	Lecturer	Microprocessors, TSN
5.	Mr.Kabiraj Sethi	Lecturer	FOS & Communication

- Laboratory facilities exclusive to the PG programme

1. TSE Laboratory
2. Communication Laboratory
3. DSP Laboratory