



DEPARTMENT OF BIOTECHNOLOGY
GOVERNMENT OF INDIA



Handique Girls' College and the DBT-Support under the Star College Scheme

Handique Girls' College, Guwahati, is an eight-decade old institution of higher education for women. It offers three-year B.A., B.Sc. and B.C.A programs, and two year post graduate Programs in Assamese, Botany, Chemistry and Zoology. The College also conducts a one-year Postgraduate Diploma program in Computer Applications. The academic programs of the College are affiliated to the Gauhati University. It has around 2300 students enrolled in the different academic programs at the undergraduate and postgraduate levels

The College has received funding support from the DBT under its Star College Scheme for implementation of the project for strengthening of Life Science and Biotechnology education and training at the undergraduate level. The departments of Botany, Chemistry, Microbiology, Physics and Zoology in the College are supported under this scheme. The most important outcome of this scheme has been that faculty are beginning to think in interdisciplinary terms and this is being reflected in the project work with which their students are engaging. Also, with greater access to experimental facilities made possible with the fund, the students in all the supported departments now have a greater opportunity to acquire and practise lab skills.



HANDIQUE GIRLS' COLLEGE

Guwahati, Assam, Estd. 1939

Progress Report, DBT Star College Scheme



Departmental Activities

Zoology

Students: Undergraduate
Course: B.Sc (Major and General)
Dissertation/ Projects: 02
 ➤ Isolation, staining & gradation of oocytes from ovary collected from slaughter house goats for preparation of *in vitro* fertilization.
 ➤ Isolation, Sperm viability, sperm count from slaughter house testes of goat for preparation of *in vitro* fertilization.
 ➤ A two year comparative study of Butterfly diversity in captive condition.
 ➤ Study of fish diversity and water quality parameters of Tingrai Fisheries Research Institute, Tingrai River, Dulaijan (Assam).



Student receiving certificate for Bioinformatics course at NIELIT, Guwahati



Dr. K.V. Santha, Assistant Professor, Venkateswara University, A.P

Visits to research institutes/industries: 01
 ➤ National Institute of Electronics & Information Technology, (Bioinformatics center), Guwahati.

Summer training: 01
 ➤ At Homi Bhabha Centre for Science Education, Mumbai

Faculty:
 Internal Faculty trained for Skill Improvement: 09

Physics

Students: Undergraduate
Course: B.Sc (Major and General)
Dissertation/ Projects: 01
 ➤ Designing a mobile detector using IC based circuit.
 ➤ Synthesis of metal sulphide nanoparticles using leaf extract of *Acalypha hispida* and its application in the detection of Mn(II) ions
 ➤ To build an A.C. milli voltmeter.



Students at IITG summer camp



Workshop organised by Physics Dept

Summer training: 04
 ➤ At University of Calcutta on "Relativity and Cosmology".
 ➤ At Indian Academy of Science, Bangalore

Faculty:
 Internal Faculty trained for Skill Improvement: 01

Chemistry

Students: Undergraduate
Course: B.Sc (Major and General)

Dissertation/ Projects: 09
 ➤ Biocatalytic reduction of nitro compounds using *Claesius carolia*
 ➤ Synthesis and characterization of urea-formaldehyde composites.
 ➤ Investigation of some plant materials as acid-base indicators.



Colour of Ethanol extract of *Clitoria ternatea* (L.) at different pH



Natural dyed Silk Fabrics using aqueous extract of dry onion peels with different mordants

Visits to research institutes/industries: 02
 ➤ Saha Institute of Nuclear Physics
 ➤ IACS and S.N. Bose Institute, Kolkata.



Visit to Saha Institute of Nuclear Physics



Visit to Bose Centre, Kolkata

Summer training: 02
 ➤ At Department of Chemistry, Gauhati University
 ➤ At IIT, Guwahati on "Focus Area Science and technology summer fellowship"

Faculty:
 Internal Faculty trained for Skill Improvement: 01

Microbiology

Students: Undergraduate
Course: B.Sc (General)
Dissertation/ Projects: 04
 ➤ Isolation and enumeration of microorganisms from different sources of milk.
 ➤ Study of air microflora by gravity sedimentation method from different areas of Handique Girls' College.

Visits to research institutes/industries: 03
 ➤ National Research Centre on Pig, Rani, Assam
 ➤ "Bianca" packaged drinking water plant, Bijoynagar, Assam



Visit to Regional Pig Research Centre, ICAR, Rani



Visit to meat processing unit, Rani

Faculty:
 Internal Faculty trained for Skill Improvement: 04

Botany

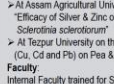
Students: Undergraduate
Course: B.Sc (Major and General)

Dissertation/ Projects: 05
 ➤ Studies on endophytic microorganisms isolated from *Curcuma longa* L. of greater Guwahati.
 ➤ Effect of organic and inorganic fertilizers on the growth of *Phytoplankton*.

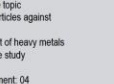
Visits to research institutes/industries: 07
 ➤ Agriculture Field Station, Kabikuchi, Assam.
 ➤ National Bureau for Plant Genetic Resources (NBPGR),
 ➤ Indian Council of Agricultural Research (ICAR)
 ➤ Central Agricultural University, Barapani

Summer training: 07
 ➤ At Assam Agricultural University on the topic "Efficacy of Silver & Zinc oxide nanoparticles against *Sclerotinia sclerotiorum*"
 ➤ At Tezpur University on the topic Effect of heavy metals (Cu, Cd and Pb) on Pea & Sand culture study

Faculty:
 Internal Faculty trained for Skill Improvement: 04



Institutional visit



Institutional visit

Guest faculty invited

Name	Designation	Host Institute	Duration of Visit	Topic of Lecture/ Discussion
Dr. Samir Kr Pal	Professor	S.N. Bose National Centre for Basic Sciences, Kolkata	13 Feb 2017	Unraveling atomic dance for essential consequences
Dr P J Handique	Professor	Dept. of Biotechnology Gauhati University	14 March 2017	Recent advances in bioscience and associated career prospects
Dr Amitabh Ray Choudhury	Professor	Calcutta University	21 Nov 2017	Enigma of Mass
Dr. Sushmita Das	Research Associate	Advanced Biotech Hub, Handique Girls' College	18 th - 23 rd June, 2018	i) PCR and its application ii) SDS- Page iii) Isolation of genomic DNA & plasmid DNA iv) AGE
Dr. K.V. Santha	Assistant Professor	Venkateswara University, A.P	15 th February 2019	Lecture cum demonstration on Foldscope microscopy

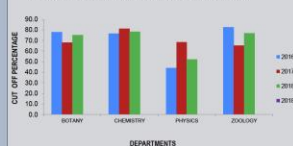


Talk by Prof Ashok K Ganguli

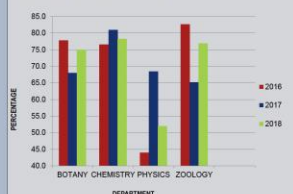


Meeting with mentor Dr Probooth Borah, Professor, College of Veterinary Science, AAU, Khanapara

Change in the cut off percentage for under graduate admission



Percentage of enrolment in PG courses



Contact information

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Awareness Programmes/ exhibitions/seminars/training courses conducted by the college

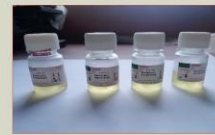
Department	Programme details	Participating Institutes
Botany	Awareness generation programme on the career prospects on Life Science with resource person from Jain University, Bangaluru	5th semester / Students of Botany & Zoology Department, Handique Girls' College
Microbiology	Training on Instrumentation	3 rd semester / Students of Botany Department, Handique Girls' College
Microbiology	Awareness programme on "Dump the junk"	Students of Microbiology, Handique Girls' College
Chemistry	Chemistry experiments and Chemistry Magic show	For the the Ishan Vikas programme, held at IIT – Guwahati
Chemistry	Origin of Quantum Theory	Nalbari College



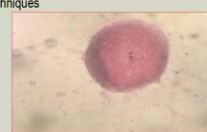
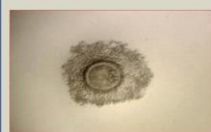
Training Programme for School Students



Training on Instrumentation



New techniques



Inter-departmental activities (20 nos):

Departments involved	Activity Details
Chemistry , Home Science	Extraction, Characterisation and Application of natural dye from Jorot tree (<i>Bixa orellana</i> Linn)
Microbiology, Zoology	A comparative study of antibacterial activity of spices <i>Syzygium aromaticum</i> , <i>Zingiber officinale</i> & <i>Curcuma longa</i>
Zoology, Microbiology	Comparison of antimicrobial activity of neem in <i>Escherichia coli</i> and <i>Bacillus sp</i>
Zoology, Microbiology	Isolation of microbes from the gut of <i>Drosophila melanogaster</i> & study of their glycosidic activity
Zoology , Botany	Isolation of microbes from the gut of <i>Channa punctatus</i> and study of their glycosidic activity
Microbiology, Zoology	Measurement of fungal growth isolated from spoiled tomato by biomass (mycelial dry weight method)
Microbiology, Botany	Determination of bacterial growth (<i>E. coli</i>) by measurement of optical density and colony forming units.

List of new Practicals/demonstrations introduced in different departments:

Department	Practical
Botany	i. Isolation of Endophytes from <i>Curcuma longa</i> . ii. Effect of organic and inorganic fertilizers on the growth of phytoplanktons
Microbiology	i. Isolation of <i>Staphylococcus aureus</i> from skin. ii. Estimation of protein from two different sources – green moong and bovine serum albumin. iii. Maintenance of stock culture in slants. iv. Use of Luria Bertani broth in place of peptone in determination of growth of <i>E. coli</i> . v. Observation of colony characteristics of <i>Staphylococcus aureus</i> on Mannitol salt agar. vi. Use of differential media – MacConkey agar . vii. Use of colony counter in enumeration of colonies. viii. Microbes in waste management.
Zoology	i. Isolation, gradation and staining of oocytes using aceto-orcein from goat's ovary collected from slaughter house. ii. Epididymal sperm isolation from slaughter house goat testis & laboratory mice. iii. Sperm viability study by dye exclusion methods using eosin & nigrosin. iv. Sperm count using haemocytometer method. v. Plant extract preparation by: a) Cold maceration method b) Hot extraction (soxhlet apparatus) method using solvents of varying polarity and analysis of established phytochemicals in extracts viz. flavanoids, isoflavones, saponins, glycosides etc. . vi. TLC separation of medicinal plants extracts. vii. Peritoneal & splenic macrophage isolation from laboratory mice and viability count. viii. Chromosome banding
Department	Demonstration
Botany	i. Preparation of wine from grapes. ii. Preparation of green tea. iii. Tissue culture technique. iv. Preservation of seeds
Microbiology	Analysis of pre and post sterilization practice on media and glasswares
Zoology	Foldscope microscope



Awareness campaigns

Impact of DBT Star College Scheme

- > **Greater access to experimental infrastructure and opportunities for development of laboratory skills**
- > **Enrolment in Science Courses** : The average annual increase in the number of applications received, for the last three years has been around ten percent with a seat to applicant ratio of 1:6.6.
- > **Improvement in inter disciplinary activities.**
- > **Accessing research journals by students:** Because of their engagement in project work, students are accessing research journals through N-LIST and other sources widening their exposure to learning resources.
- > **Smooth conduct of PG courses:** The Star College scheme has encouraged three participating departments to start PG courses.