SANT GADGE BABA AMRAVATI UNIVERSITY, AMRAVATI

P. G. Department of Applied Electronics

(Faculty of Science and Technology)

ATTAINMENT OF PROGRAMME OUTCOMES (PO), PROGRAMME SPECIFIC OUTCOMES (PSO) AND COURSE OUTCOMES (CO) - SAMPLE METHODS AND STRATEGIES

NAME OF THE DEPARTMENT: APPLIED ELECTRONICS		
Methods/Strategies of measuring the attainment level of:		
Programme Outcomes (PO)	**Programme Specific Outcomes (PSO)**	**Course Outcomes (CO)**
1. At the time of completion of the programme, the student will able to develop extensive knowledge in various areas of Electronics. 2. Apply the knowledge of mathematics, science, engineering fundamentals and electronics to the solution of engineering problems. 3. Identify, formulate, research literature, and analyse science and engineering problems using the first principles of mathematics and engineering sciences. 4. Understand solutions for electronic and allied systems and design system modules or processes that meet the specified needs with appropriate societal consideration. 5. Choose and apply appropriate modern tools/frameworks/platforms, software simulators, techniques, resources, and modern engineering and IT tools for	1. At the end of the two-year M. Sc. Applied Electronics programme, the student will understand and be able to explain different branches of Electronics such as Electronic Devices and Circuits, Linear and Digital Integrated Circuits, Communication Engineering, Analog and Digital Electronics, Microprocessors, Microcontrollers, VLSI, Embedded Systems, Smart Sensors, Digital Signal Processing, Microwave Engineering, Embedded System Design, Computer Organization, Optical Fiber Communications, Mobile Communications, etc. 2. Courses in foundational subjects like Electrical Engineering and Network Analysis, Electronic Devices and Circuits, Linear Integrated Circuits, Linear and Digital Integrated circuits, Microprocessors and Microcontrollers, Digital Signal Processing, Microwave Engineering, Optical Fiber	1. Student are able to explain different branches of Electronics such as Electronic Devices and Circuits, Linear and Digital Integrated Circuits, Communication Engineering, Analog and Digital Electronics, Microprocessors, Microcontrollers, VLSI, Embedded Systems, Smart Sensors, Digital Signal Processing, Microwave Engineering, Embedded System Design, Computer Organization, Optical Fiber Communications, Mobile Communications, etc. 2. Student performed laboratory experiments or practical on courses in foundational subjects like Electrical Engineering and Network Analysis, Electronic Devices and Circuits, Linear Integrated Circuits, Linear and Digital Integrated circuits, Microprocessors and Microcontrollers, Digital Signal Processing, Microwave

solving engineering problems with an understanding of the limitations. 6. Function effectively as an individual, and as a member or leader in diverse teams. 7. Communicate effectively on engineering activities with the science and engineering community and with the society at large, such as, being able to comprehend and write effective reports and make effective presentations.	Communication Engineering, Embedded System Design, etc. have a prominent lab component, offering hands-on training and exercises on numerous practical aspects of crucial importance. A postgraduate of the M. Sc. Applied Electronics Program will demonstrate: 3. An ability to understand the basic concepts in Electronics & Communication Engineering and to apply them to various areas, like Electronics, Communications, Signal processing, VLSI, Embedded systems etc., in the design and implementation of systems. 4. An ability to solve Electronics and communication Engineering problems, using latest hardware and software tools, along with analytical skills to arrive at cost effective and appropriate solutions. 5. Skill development by undertaking supervised projects by students with a flexibility to balance between research- and application-oriented work that require innovative approaches.	Engineering, Optical Fiber Communication Engineering, Embedded System Design, etc. 3. Students are offered hands-on training on numerous practical aspects of crucial importance. 4. Students are acquainted with the operation, handling and usage of laboratory electronic instruments in practical, project work, product design, etc. 5. Performance in Seminars 6. Performance in Projects, which aim to solve real-world problems 7. Skill development through hands-on training workshops 8. Ability to design and fabricate PCB for electronic circuit 9. Survey from students

The Post Graduate Department of Applied Electronics of Sant Gadge Baba Amravati University, Amravati offers a four-semester PG course in M. Sc. Applied Electronics with specific Programme Outcomes, Programme Specific Outcomes and Course Outcomes.

From viewpoints of Programme Outcomes (PO), it is noticed that the students of M. Sc. Applied Electronics programme undertake projects to seek the solutions of problems and they complete this project work during the third and the fourth semester of the programme. For delivering seminars on state-of-the-art topics, students understood the importance of much needed literature review. They also acquired distinctive skills required for design and fabrication of low-cost energy-efficient LED lamps from the teachers of the department and provided training to their junior student-colleagues under the supervision of the faculty of the department. In addition, our students also provided hands-on training to aspiring students of other affiliated science colleges affiliated to Sant Gadge Baba Amravati University, who participated in LED lamp fabrication workshops organized by the Department of Applied Electronics, every year. Students carry out their project work in groups, wherein one of the students having the best academic performance within a group acts as a group leader. Students participated in various department level, college level, university level, state level competitions, etc. by demonstrating their working model, poster, ideas, etc. They are able to present their work effectively through oral presentations as well as through documented technical reports. Students were also able to qualify in NET and SET examinations. This is how, the Programme Outcomes (PO) are achieved by the students.

So far as the Programme Specific Outcomes (PSO) are concerned, students comprehended different branches of Electronics such as Electronic Devices and circuits, Linear and Digital Integrated Circuits, Communication Engineering, Analog and Digital Electronics, Microprocessors, Microcontrollers, VLSI, Embedded System Design, Computer Organization, Optical Fiber Communications, Mobile Communications, etc. They also had a rigorous laboratory exposure (experiments/practical/hands-on) on crucial components of foundational subjects like Electrical Engineering and Network Analysis, Electronic Devices and Circuits, Linear and Digital Integrated Circuits, Microprocessors and Microcontrollers, Digital Signal Processing, Microwave Engineering, Optical Fiber Communication, Embedded System Design, etc. As a result, students could use these concepts in design and implementation of electronic systems. Students were also trained with latest hardware and software tools in order to suggest cost-effective solutions to problems

faced by our society. Every year, final year students undertake supervised projects under the guidance of a teacher, who works as a project-guide and students in turn prove their ability to solve electronics and communication engineering and allied engineering problems using innovative approaches of electronics science and technology.

The M. Sc. Applied Electronics programme is comprised of 33 different courses distributed over four semesters. These courses constitute 15 Theory courses, 5 Professional Elective Courses, 12 Laboratory courses, Project and Seminar, etc. Every course has its unique course outcome. Students are evaluated in all these 33 courses by university end-semester examinations. Moreover, students are also assessed internally in the aforementioned courses by the concerned assigned teacher. In view of this, attainment of course outcomes can be measured by internal assessment of students by conducting test papers, surprise examinations, problem solving sessions, seminars and assignments. It can also be evaluated from the performance of the students in the practical and laboratory sessions. Concerned teacher in-charge of the course is made responsible for internal assessment of students. The knowledge level of students can be examined with viva-voice and communication skills.

Generally, Course outcomes (CO) can be assessed in terms of achievement of students in the university examinations. In addition, attainments of course outcomes are also evident in terms of the quality and utility of project work undertaken and completed by students, quality of the seminars presented by students, quality of the fabricated or designed models (systems or gadgets) by students, technical reports describing project, seminar, etc. So far as attainment of Project course outcome is concerned, students show a sound technical knowledge of their selected project topic. Students design the system or product (module) incorporating hardware or software or coexistence of hardware and software (hybrid approach). They are able to synthesize the results. They can interpret the results for application to the problem chosen. They can develop the concept followed by a detailed design solution.

All students deliver a seminar on advanced topics (not included in the curriculum) before an evaluation committee of the department. Students study research papers to understand a new field in the absence of a textbook. They

summarize and review the literature studied. After identifying promising new directions of various cutting-edge technologies, they choose an appropriate topic for seminar presentation. Attainment of the course outcome of the seminar can be measured by taking into account the following factors, such as, the clarity of speech, appropriateness of the level of material, familiarity with the topic including current research findings, thoroughness of the ideas presented and the analysis, overall organization and integration, presentation skills, etc.

From the analysis of the university examination results over the last five years, it is noticed that on an average 80% of the students are able to attain the course objectives, satisfactorily. During the preceding five years, it is also observed that girl students (cumulative total 60) outnumbered boys (cumulative total 24) in post-graduates produced by the department.

In order to cope up with the most recent developments and trends in the technology, the contents of the courses are brought up-to-date by revising the curriculum of M. Sc. Applied Electronics programme, periodically.