VISVESVARAYATECHNOLOGICALUNIVERSITY

JnanaSangam,Machhe,Belagavi-590018

SchemeofTeachingandExaminations2025 Electrical and Electronics Engineering

Outcome-BasedEducation(OBE)andChoice-BasedCreditSystem(CBCS) (Effective from the academic year 2025-26)

OverviewofCourses,Credits,Projects,andInternshipsunderVTUCurriculum

(A) AbbreviationsAdoptedintheSchemeofTeachingandExaminations

Course		GeneralTerms		GeneralTerms	
Acronyms	**ExpandedForm**	**Acronyms**	**ExpandedForm**	**Acronyms**	**ExpandedForm**
AEC	AbilityEnhancement Course	AICTE	AllIndiaCouncilof TechnicalEducation	YOG	Yoga
ASC	AppliedScienceCourse	CCA	ContinuousComprehensive Assessment	P	Practical
BSC	BasicScienceCourse	CGPA	CumulativeGradePoint Average	SEE	SemesterEnd Evaluation
HSMC	HumanitiesStudies and ManagementCourse	CI	ClassroomInstruction	SGPA	SemesterGradePoint Average
IPCC	IntegratedProfessional CoreCourse	CIE	Continuous Internal Evaluation	SL	Self-Learning
NCMC	Non-CreditMandatory Course	COE	CentreforOnlineEducation	SWAYAM	StudyWebsofActive-Learning for Young AspiringMinds
OEC	OpenElective	CUL	Cultural	T	Tutorial
PCC	ProfessionalCoreCourse	NCrF	NationalCreditFramework	TW	TermWork
PCCL	ProfessionalCoreCourse	L	Lecture	VTU	Visvesvaraya
PEC	ProfessionalElective	LI	LaboratoryInstruction	VTUonline Course	VTU online courses offeredbyCentrefor Online Education, Mysuru.
PE	PhysicalEducation	NPTEL	NationalProgrammefor		
SEC	SkillEnhancementCourses	NSS	NationalServiceScheme		

(B) AcademicCreditFrameworkinaccordancewiththeNationalCreditFramework(NCrF)

TheNationalCreditFramework(NCrF),introducedunderIndia'seducationreforms,servesasanumbrellaframeworkforthecreditisationoflearning across school education, higher education, vocational education, and experiential learning.

NCrF credit levels are determined based on a combination of cumulative years of learning, the complexity of learning outcomes, and the rigor of assessment. These levels signify the degree of competence and complexity attained by the learner, progressing from foundational schooling to advanced doctoral research.

Levels 1 to 4 correspond to school education up to the 12th standard, while Levels 4.5 to 8 correspond to higher education, ranging from the undergraduate level to the Ph.D. level.

In the earlier system, credits were primarily based on contact time (lecture hours per week × number of weeks per semester/year), assuming that learning is directly proportional to time spent in classroom instruction.

However, the NCrF adopts a comprehensive and outcome-based approach by assigning credits to all forms of learning, including, (i) Classroom teaching, (ii)Laboratory work, (iii)Projects, (iv)Internships and apprenticeships, (v)Online and blended learning, (vi)Fieldwork and community engagement, (vii)Recognition of Prior Learning (RPL), (viii)Sports and arts activities, and (ix)On-the-job training.

Creditsarethusbasedonnotionallearninghours,representingthetotallearnereffortratherthanonlycontacthours.

This definition aligns Indian education with Global outcome-based credit systems, and international credit transfer practices [e.g., European Credit Transfer and Accumulation System (ECTS)-like frameworks].

According to NCrF, one academic year of learning is equal 1,200 notional learning hours (not a scientifically-validated law or psychological constant, but a policy design hours) and includes classroom teaching, self-study, assignments, projects, laboratory work, co-curricular and extra-curricular activities,internships,apprenticeshipsandotherassessedlearningexperiences.Forthese1,200hoursastudentisexpected toearn40credits,which means 1 credit corresponds to approximately 30 hours of academic learning.

Although traditional universitysystems oftenequated 1creditwith approximately13 to15contacthours per semester, VTU, in alignmentwith NCrF, considers 14-weeks of structured academic interaction per semester with students is equivalent to approximately 30 notional hours per credit.

Thelearningmethodologiesinclude:

(i) Classroom Instruction (CI): Includes different instructional/implementation strategies, such as Lecture (L), Tutorial (T), Case method, Demonstrations,Videodemonstration,Problembasedlearningetc.,todelivertheoreticalconceptswithintheclassroommeasuredinNumberofhours per semester.

(ii) LaboratoryInstruction(LI): ExpressedasnumberofhourspersemesterwhichIncludesexperiments/practicalperformances/problem-based experiences in laboratory, workshop, field or other locations using different instructional / Implementation strategies.

(iii) Term work (TW): Includes assignments, seminars, presentations, case studies, micro projects, field activities, industrial visits, academic preparation duration and any other student activities in Number of hours per semester.

(iv) Self-Learning(SL):MOOCs (SWAYAM/NPTEL/Industrycertifiedcourses),spokentutorials,onlineeducationalresources,self-initiatedprojects, Learning through digital resources etc in Number of hours per semester. (If provided in curriculum structure).

VTU, in alignment with NCrF, considers 14-weeks of structured academic interaction per semester with students as equivalent to approximately 30 notional hours per credit.

Tablebelowshowsthecreditstructure,equivalentNCrFlearninghoursadoptedby VTU:

Table7.0.1VTUadoptedNCrFcredit structure					
Particulars	**Classroom Instruction (CI) in Hours per semester**		**LaboratoryInstruction (LI) in Hours per semester**	**Termwork(TW)andSelf-Learning(SL)inHoursper semester**	**Totalnumberof Teaching-Learning hours persemester**
	L	**T**	**P**	**TW+ SL**	
1Credittheorycourse	14	-	-	16	30
1CreditPracticalcourse	-	-	28	02	30
2Credittheorycourse	28	-	-	32	60
3Credittheorycourse	42	-	-	48	90
3Credittheorycoursewith Tutorial	28	28	-	34	90
4Credittheorycourse	56	-	-	64	120
4Credittheorycoursewith Tutorial	42	28	-	50	120
4CreditIntegratedCourse	42	-	28	50	120
Projectwork	-	-	-	Asperthetypeofproject	
Internship	-	-	-	AsperthetypeofInternship	

NCrFisdesignedtoworkwithABCforyears,where,creditsaredigitallystoredtoaccumulate,transfer,andredemptionacrossinstitutionsforvertical and horizontal mobility across sectors, which is essential for MEME.

(C) Detailsof Courses

(1) IntegratedProfessionalCoreCourse(IPCC): TheIntegratedProfessionalCoreCourse(IPCC)referstoacoretheorycoursethat is integrated with a laboratory of the same subject. Each IPCC carries 4 credits, with Teaching–Learning hours structured (L : T : P)aseither(3:0:2).ThetheorycomponentoftheIPCCshallbeevaluatedthroughbothContinuousInternalEvaluation(CIE)and SemesterEndExamination(SEE).Thelaboratorypartshallbeassessedexclusivelythrough CIE,withnoSEE.However,questions derived from the laboratory part may be included in the SEE question paper to ensure comprehensive evaluation

(2) Non-Credit Mandatory Courses (NCMC): are aimed at enhancing students' knowledge, skills, and awareness beyond the core curriculum.SuccessfulcompletionoftheNCMCiscompulsoryforfulfillingtherequirementsoftheacademicprogram.Itshallnot beconsideredforthecomputationofSGPA,CGPAandverticalprogression.EachstudentshallregisterfortheprescribedNCMC(s) in the prescribed semester.A student who fails to qualify in the prescribed NCMC shall not be eligible for the conferment of the degree.

(3) Professional Elective Courses (PEC): A professional elective course (PEC) is intended to enhance the depth and breadth of educational experience in the Engineering and Technology curriculum of the same discipline.

(4) Open Elective Courses (OEC): A open elective course (OEC) is a course offered by departments other than a student's parent department. These interdepartmental /interdisciplinary courses allow students to explore disciplines beyond their core area of study. These courses are intended to promote interdisciplinary learning, broad-based education, thereby enhancing a student's overall knowledge, creativity, and employability. Registration to open electives shall be documented under the guidance of the Program Coordinator/ Advisor/Mentor/Proctor.

(5) Ability Enhancement Course Laboratory (AEC): An Ability Enhancement Course Laboratory is a practical, skill-oriented lab course designed to strengthen students' practical abilities, professional competencies that support communication, environmental awareness,computationalthinking,interdisciplinarylearning,andapplicationskillsthroughhands-onlearningexperiences. Thelaboratorymaypertaintodisciplinaryorinterdisciplinaryinvolvingexperiments,designtasks,andmini-projectsalignedwith current industry practices.

(6) SkillEnhancementCourses(SEC): Thesecoursesareintendedtodevelopspecificpracticalskillsandcompetenciesthatimprove students' employability, technical proficiency, and professional readiness to bridge the gap between academic and industry requirements. These courses emphasize hands-on training, application of theoretical knowledge, and development of discipline-relevantandtransferableskillsrequiredinindustryandsociety,anddevelopentrepreneurshipandstart-upskills.

(7) Online Courses: Online courses are educational programs delivered over the Internet through a digital platform, allowing studentstoaccesslessons,assignments,anddiscussionsfromanywhereatanytime.Mostonlinecoursesofferflexibility,allowing students toaccess materialsandcomplete assignments ontheirownschedule. However, students have topass thecourse within a stipulated period as per the norms of the university.

(8) VTUOnlineCourses:VTUOnlineCoursesareonlinecoursesofferedbytheCentreofOnlineEducation(COE),Mysuru.Awiderange of multidisciplinary courses is made available to learners anytime and anywhere, enabling them to earn University-prescribed credits through duly conducted proctored examinations for the award of the degree.

NPTEL/SWAYAM courses adopted by VTU shall be offered in accordance with the NPTEL/SWAYAM course delivery framework, wherein teaching–learning is carried out through the online MOOC platform, assignments areadministered periodically, and assessment is completed through a centrally conducted proctored examination as prescribed by the respective platform.

(9) NPTEL/SWAYAMOnlineCourses: TheNationalProgrammeonTechnologyEnhancedLearning(NPTEL)/SWAYAM(StudyWebs of Active Learning for Young Aspiring Minds) are the specific Indian platforms to host national Massive Open Online Courses (MOOCs). It offers online courses on a wide range of disciplines to learners anywhere, anytime, to earn university-prescribed creditsthroughproctoredexaminationfortheawardofadegree.AllNPTEL/SWAYAMcoursesareMOOCs,butnotallMOOCsare offered on these specific Indian platforms.

(D) NationalServiceScheme/PhysicalEducation/Yoga(NSS/PE/YOG)

Allstudentsarerequiredtoregisterforanyoneofthefollowingcourses;NationalServiceScheme(NSS),PhysicalEducation (PE)(Sports and Athletics), or Yoga (YOG)—with the respective course coordinator during the first week of the third semester.

CollegesshallsubmitContinuousInternalEvaluation(CIE)marksforeachsemesterbasedontheactivitiescompletedbystudentsunder the selected course.

- Studentsmayoptfordifferentactivities/optionsacrosssemesters.Forinstance,astudentparticipatinginPEduring3rd semester may choose NSS in the 4th semester or Yoga.
- Activitiesshallbeconductedovertwosemesters(III&IV),andsuccessfulcompletionoftheregisteredcourse/orcourses along with the required CIE score is mandatory for the award of the degree.
- InstitutionsmustensurethateventsareappropriatelyscheduledandreflectedinthesemesterwisecalendarforNSS,PE, Music, and Yoga activities.

Thesecoursesshallnotbeconsideredforthecalculationof SGPAorCGPAandforverticalprogression.However,completionof course(s) is compulsory for degree eligibility.

(E) Projects

1. **CommunityProject**

A community is a social unit or group of people sharing socially-significant characteristics, such as place, set of norms, culture, religion, values, customs or identity. A community project involves addressing issues or needs within such a community or a network of entities working toward a common purpose. These projects may cover a wide range of areas, including welfare, sustainability, technology integration, and social development. Examples include establishing and maintaining an orphanage, implementingsolarpowergenerationanditsmaintenance,ordevelopingenvironmentalimprovementsolutions,etc.Acommunity project is an experiential learning activity that encourages students to identify, analyse, and address real-life problems of the communityusingengineeringknowledge.Itaimstopromotesocialresponsibilityandcivicengagement,interdisciplinarythinking and collaboration and practical application of theoretical concepts, thereby enabling students to contribute meaningfully to communitywelfareandsustainabledevelopment.Studentscantakeupprojectindividuallyorinagroupnotexceeding4students. The evaluation shall be done as per the following;

CIE: The CIE marks shall be awarded by a committee consisting of the Head of the concerned Department and two senior faculty members of the Department, one of whom shall be the Guide. The CIE marks awarded for the project work shall be based on the rubrics.

SEE: SEE will be conducted by the two examiners appointed by the University. The SEE marks awarded for the project work shall be based on the rubrics.

2. **EnvironmentalScienceProject**

TheEnvironmentalScienceProjectisanappliedlearningcomponentdesignedtodevelopstudents'awareness,understanding,and responsibility toward the environment. It provides an opportunity to study real-world environmental issues and apply scientific and engineering principles to design feasible and sustainable solutions.

Thetopicsunderenvironmentinclude,butnotlimitedto,climatechange,biodiversity,airandwaterpollution,landuse,excessuse of natural resources, earthquakes, rise in the earth's temperature, power generation, soil erosion, environment issues related programme, etc.

The project involves problem identification, field surveys, case studies, data collection, environmental audits, analysis, and proposalofremedialorpreventivemeasuresaimedatimprovingbiodiversity,airquality,andthermalcomfort,etc.Studentscan

takeupprojectindividuallyorinagroupnotexceeding4students.StudentscanoptforInterdisciplinaryProjectbasedon their interest.
Theevaluationshallbedoneasperthe following;

CIE: The CIE marks shall be awarded by a committee consisting of the Head of the concerned Department and two senior faculty members of the Department, one of whom shall be the Guide. The CIE marks awarded for the project work, shall be based on the rubrics.

SEE: SEE will be conducted by the two examiners appointed by the University. The SEE marks awarded for the project work shall be based on the rubrics.

3. **HackathonBasedProject(Academic)**

Thetermhackathonisderivedfromthecombinationofhack(referringtocleverproblem-solving,notillegalactivity)andmarathon, whichdenotesanarduous(i.e.,difficult)intellectualtaskrequiringsustainedeffort,endurance,andmentalresilience.Themeaning ofahackathonvariesdependingonthespecificcontextandintent.Inanacademiccontext,ahackathoncanbeconsideredtoinvolve several concepts, ranging from resourceful, unconventional approaches to problem-solving.

Though a hackathon is an event, typically lasting for a few days to address a specific challenge, for academic purposes, it is conducted as a noncompetitive semester-long activity. The evaluation is done as and when the project is completed, by a panel of industry experts.

The hackathons not only help participants develop skills like problem-solving, critical thinking, creativity, teamwork, communication and time management, but also foster indigenous technology development, promote innovation and entrepreneurship, and contribute to non-formal learning and skill enhancement.

Studentscantakeupahackathonprojectindividuallyorinagroupofnotexceeding4students.

TherespectiveBoSwillannouncetheproblemstatementsinthebeginningofthe5thsemester.Thetopicselectedcanbediscipline specific, interdepartmental, industrial, social (refers to immediate human relations, interactions, and individual behaviour within acommunity),societal(describeslarger,generalissues,institutions,andstructuresthatdefinesocietyasawhole),environmental, health, financial, or innovative in nature, leading to development of a working prototype, application, or product.

HackathonprojectsarealignedwiththeprinciplesofOutcome-BasedEducation(OBE)andsupporttheobjectivesofinnovation, skill development, and experiential learning in engineering education.

Projectsshallbeevaluatedbyindustryexperts,basedoncreativity,problem-solvingapproach,teamwork,andpossible implementation, as far as possible, as and when the project is completed.

Theevaluationshallbedoneasperthe following;

CIE: The CIE marks shall be awarded by a committee consisting of the Head of the concerned Department and two senior faculty members of the Department, one of whom shall be the Guide. The CIE marks awarded for the project work, shall be based on the rubrics.

SEE:SEEwillbeconductedbytheindustryexpertsappointedbytheHeadoftheInstitute/University.TheSEEmarksawardedfor the project work shall be based on the rubrics.

4. **CapstoneProject**

The Capstone project is a comprehensive, year-long project carried out in two phases during 6th and 7th semesters of the undergraduateengineering/technologyprogram.Itintegratesknowledgeandskillsacquiredfrommultiplecoursesanddisciplines to address a complex, real-world problem.

This project provides students with an opportunity to apply scientific principles, engineering methodologies, and technological tools to conceive, design, implement and evaluate an engineering solution. It serves as a culminating academic experience to demonstrate program outcomes, including problem-solving ability, teamwork, communication skills, and practical application of engineering principles. Students can take up project individually or in a group not exceeding 4 students. The group may have students from the same discipline and drawn from different disciplines.

TypesofCapstoneProjects:

Capstoneprojectsundertakenforoneyearmayfallintooneormoreofthefollowingcategories:

a) **Research-OrientedProjects:**
   - Focusoninvestigatingnewconcepts,theories,ortechnologies.
   - Aimtogeneratenewknowledge orcontributetoacademicresearch.

b) **Experimental/AnalyticalProjects**
   - Basedonlaboratoryorfieldexperimentstovalidateahypothesisorstudya phenomenon.
   - Includingdetaileddatacollection,analysis,andinterpretation.

c) **Simulation/ModellingProjects**
   - Usecomputationaltoolstomodel,simulate,andpredictsystembehaviour.

- Reducetheneedforphysicalprototypingintheinitial stages.

d) **Industrial/Industry-SponsoredProjects**

- Carriedoutincollaborationwithanindustrypartner.
- Addressreal-worldengineeringproblemsfacedbythe organization.

e) **Interdisciplinary/MultidisciplinaryProjects**

- Combineknowledgeandtechniquesfrommultipleengineeringdomainsorotherfieldssuchasmanagement,medicine, or environmental sciences.

f) **Entrepreneurial/InnovationProjects**

- Focusonproductorserviceinnovationwithpotentialforcommercialization.
- Includeaspectsofmarketanalysis,costestimation,andbusinessplanning.

Phase I Evaluation: Capstone Project Phase-I shall have only Continuous Internal Evaluation (CIE). In case disciplinary capstone project, the CIE shall be conducted by the Departmental Project Review Committee, which consists of a Senior Professor, the Project Guide, and one additional faculty member appointed by the principal for projects within the parent discipline.

For Interdisciplinary Projects, the Project Review Committee will consist of one Senior Professor, the department and interdepartmental Project Guides and one faculty member from a department related to the interdisciplinary project. The committee members are appointed by the principal of the college.

Phase-Ievaluationshallbebasedon**rubrics**designedtomeasuregraduateattributesdefinedbyNBA.Successfulcompletionof Phase-I allows the student to proceed to **Phase-II**.

PhaseII Evaluation:

CIE of Phase shall be evaluated as indicated with phase -I evaluation.The SEE shall be conducted by university-appointed examiners**.** The assessment shall be based on rubrics designed to measure graduate attributes defined by NBA.

(F) Internship

Internship refers to the position of a student as trainee or a temporary (or unconfirmed) employee, who works in an organization, with or without pay, in order to gain work experience or satisfy requirements for a qualification. It is a structured, supervised professional experience in an industry, research organization, or community setting. Students taking up internship may be with or without stipend.

Internships play a vital role in bridging the gap between theoretical education and professional practice.In general, engineering internships serve as a crucial component of professional education by providing experiential learning, industry readiness, and holistic skill development, ultimately producing competent engineers or entrepreneurs. Apart from these, it develops professional ethics, work culture awareness and communication skills.

Someofthecommontypesofinternshipsareas follows:

i. **Industry Internship:** Carriedout in the engineering industry, companies, manufacturingunits, startups, business, IT industry. The topic involved may be technical, managerial, production-related tasks, live projects, or innovative activities.

ii. **Research Internship:** Carried out at universities, research labs, or R and D departments or organisations. The internship may involve literature review, data analysis, and experimental work leading to publications, prototypes, technical reports or innovations. The research internship may induce students to plan for higher studies or academic careers.

iii. **Academic Teaching Internship:** Carried out at educational institutions. The students assist in academic activities, laboratory sessions or content development, and prepare or present report, presentation and student evaluation. The internship encourages interest in academia and pedagogy, develops new skills, helps to gain a competitive edge on the job market or for post-baccalaureate studies.

iv. **CommunityorSocietalInternship:**Carriedoutwithgovernmentschemes,orruraldevelopmentprojects,Non-Governmental Organisations (NGOs). The internship focused on social and community development activities promotes social responsibility, sustainable development awareness, encourages civic responsibility and ethical engagement.

v. **Entrepreneurship Internship:** Undertaken in association with start-ups, or entrepreneurship cells or launching own idea in Pre-Incubation/Incubation centres. The internship offers exposure to business planning, prototype product development, and promotes innovation, risk-taking, and entrepreneurial mindset.

vi. **Virtual or Remote or Online Internship:** Undertaken using online tools and digital collaboration platforms. Such internships arecommonincontentwriting,datascience,marketing,andsoftwaredevelopment.Itoffersflexiblelearningenvironmentsand access to global opportunities, and allows participation in real projects without being physically present, from anywhere and anytime.

vii. **GovernmentInternship:**Ministries,publicsectorunits,orcivicbodiesoffersuchinternshipsinpolicyresearch,administrative tasks, or public service projects. This internship is for students interested in governance or public administration.

viii. **Post-Placement Internship:** Refers to the internship offered to students after they receive a confirmed job offer (placement) from a company, but before formally joining as full-time employees. This internship (on-site, virtual, or hybrid) ensures that studentsaregroomedtobeprofessionallyready,technicallycompetent,andculturallyalignedwiththeorganizationevenbefore official induction.

ix. **Skill Enhancement Internship:** Carried out at reputed organisations in offline or online mode. The aim of the internship is to exposetoreal-worldtools,technologies,andprofessionalenvironmentstoimproveastudent'semployabilitybyofferinghands-on experience, application of theoretical concepts, and skill development aligned with current industry and technical trends. SkillEnhancementInternships,dependingonfocusareaandscope,canbecarriedoutatvariousorganisationssuchas,Academic and Research Institutions, Industry and Corporate Settings, Government and Public Sector, NGOs and Social Enterprises. ForSkillEnhancementInternshiptopicsreferto https://online.vtu.ac.in/category/courses/Skill-Enhancement-Course.

NoteonInternshipfortheAttentionofStudentsandColleges

- Placementtrainingconductedatthecollegelevel,whetherbythird-partyagencies,traininginstitutes,orinternalfaculty,shallnot be considered as internship for either a 15 week or a 30-week period.
- Theofficialengagementperiodof15-weekor30-weekforstudentsselected/recruitedbythecompany/organizationonlyattheir premises under the supervision of the company, shall only be considered as an internship.
- Theperiodoftrainingandworkingofstudentswhohavebeenrecruitedasemployeesbyorganisationsatthebeginningofthe 4thyear of the programme, shall also be treated as an internship.
- Studentsandcolleges/institutionsshallfollowalltheguidelinesandproceduresoftheorganizationandtheUniversity'sInternship Guidelines, and complete the internship within a period that matches with the VTU Calander and examination timetable.
- The assigned institution faculty mentor/ coordinator/guide should monitor the student's progress, and document offer letters,training reports, attendance, and evaluations for awarding academic credits.
- Allstudentsundergoinganinternship,shouldadheretoalltheguidelines,reportingprotocols,andevaluationprocedures prescribed by the University.
- Studentsmustsubmitthecertificateofcompletionofaninternshipwiththeperiodofinternshipclearlymentioned,fromthe respective company/organization.

- Collegesmustsubmitdetailsofstudentsoptingforinternshipduringtheoddandevensemesters,alongwithacopyofthecompany selection letter, to the VTU when notified by the University.

Attention: In addition to the internship support provided by the college, students have the option to select internships through the AICTE and VTU Internship Portals. To ensure uniformity, quality, and transparency in the internship process, VTU has developed a dedicated web portal that serves as a single platform where colleges can also register companies offering internships. Every student is required to register on the portal before the commencement of their internship, and their progress will be monitored through the same platform.

As per VTU norms, the CIE shall be conducted based on the students' performance during the training program, assessed through rubricsfromthecompanysupervisor.TheSEEevaluationshallbeconductedbythecollegeaspertheexaminationtimetablepublished by the VTU.

(F) BridgeCoursesonMathematicsforLateralEntryStudents:

Alllateral entry students are requiredtoregistercompulsorilyforthis course in the 3rdsemester and 4thSemesterandmust appear for CIE. Passing inthis course is mandatory for the award of the degree. Those who fail to secure the passing CIE marks, must appear for the summer semester of the academic year. However, this course will not be considered for vertical progression, SGPA, and CGPA calculation.

(G) AICTEActivityPointsRequirementforBE/B.Tech.Programmes

As per AICTE guidelines (refer to Chapter 6 – AICTE Activity Point Program, Model Internship Guidelines), in addition to academic requirements, students must earn a specified number of Activity Points to be eligible for the award of the degree. The points to be earned are as follows:

1. Regularstudentsadmittedtoa4-yeardegreeprogrammustearn100ActivityPoints.
2. Lateralentrystudents(joiningfromthesecondyear)mustearn75Activity Points.
3. Students transferred from other universities directly into the fifth semester must earn 50 Activity Points from the date of entry into VTU.

These Activity Points do not carry any credits, and therefore, the points are not considered for **the** SGPA/CGPA or for vertical progression. However, earning Activity Points is mandatory for the award of the degree, and the points earned will be reflected on the eighth semester Grade Card.

Thehoursspentearningtheactivitypointswillnotbecountedforregularattendancerequirements.Studentscanaccumulatethese

points at any time during their program period, including weekends, holidays, and vacations, starting from the year of admission, provided they meet the minimum hours of engagement prescribed for each activity by AICTE.

Ifastudentcompletesallthesemesters(eight/six)successfully,butfails toearntherequiredActivityPoints,theeighth-semesterGrade Card will be withheld until the Activity points requirement is fulfilled. Also, the degree will be awarded only after the Grade Card has been released.

(H) Seventh(7)andEight(8)SwappableSemesterSchemes

Option -1: Swappable Semester Scheme - A

To ensure equitable access to internship opportunities, provision has been made to swap seventh and eighth semesters under Scheme A.The details of the Scheme – A are as follows:

- Studentswhohaveanoffertoenrolfora15-weekinternship,beforethestartof4th year,shallregisterforVIIIsemestercourses instead of VII semester courses and take up respective semester examination.
- ThosewhohavenooffertoenroltoA15-weekinternship,beforethestartof4th year,shallregisterVIIandVIIIsemesterscourses inthechronologicalmannerandcompletetheprogramme.Inthiscasetheinternshipshallbecarriedoutduring VIII semester.

Option-2:Two-SemesterInternshipScheme–B

- StudentswhohaveclearedallthecoursesuptoVIsemesterinfirstattemptonly(i.e.,studentshavingnobacklogs)andhavean internship offer for a period of 180 working days or 30 working weeks, are only eligible for Scheme – B. The internship commence date should coincide with the 4th year academic calendar of VTU. Such students, shall produce the confirmed internshipletter,tothePrincipal/AcademicAuthoritytogetpermissiontoregisterforthesummersemestertooptforScheme -B.
- Sucheligiblesstudentsshallregisterforthecourse1BEE701inthesummersemesterofthesameacademicyear(i.e.,aftertheir VI semester) and complete the said course in first attempt only.
- Incase,theyabsentfortheexaminationorfailsinthecourse1BEE701,theyshallnotbeconsideredeligiblefortheScheme–B. However, they shall register for Scheme – A.
- Aftercompletingthecourse1BEE701,studentswithconfirmedinternshiplettertocarryouttheinternshipforaminimum180 working days or 30 working weeks, shall register for the Scheme – B.
- In case students cannot commence the internship for various reasons, they not be considered for Scheme – B.In such cases, they shall register for Scheme – A. However, they will be exempted from studying the course 1BEE701 again.

- A request letter with internship permission letter must be submitted to Registrar, VTU through concerned authorities of the institution.OnlyafterreceivingtheapprovalfromtheRegistrar,studentsproceedwiththeinternshipasmentionedinOption Scheme B.

(I) CapstoneProjectEvaluationGuidelinesforStudentsOptingforInternshipfortwosemestersduration:

a) **Industry Internship Leading to Capstone Project:** For students opting for a two-semester Industry Internship that leads to thecompletionoftheCapstoneProject,thePhase-Ievaluationwillbe conductedattheendoftheVII semester,andthePhase-II evaluation will be conducted at the end of the VIII semester.

b) **Industry Internships Not Leading to Capstone Project:** For students opting for a Industry Internship that does **not** lead to thecompletionoftheCapstoneProject,theyarerequiredtoundertaketheCapstoneProjectseparately.BothPhase-IandPhase-IIoftheProjectWorkmustbecompletedasperthePrescribedguidelines,undertheguidanceofacollege-levelguideormentor.

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IIISEMESTER

Sl. No	Courseand CourseCode		CourseTitle	TeachingDepartment(TD)and QuestionPaperSettingBoard(PSB)		TeachingandLearningScheme					Examination				Credits
						ClassroomInstruction(CI)hourspersemester		LaboratoryInstruction(LI)hoursPersemester	Termwork&self-learninginhours	Teaching-Learninghourspersemester	Durationinhours	CIEMarks	SEEMarks	TotalMarks	
						L	T	P	TW+SL						
1	ASC	1BMAT301	Mathematics– IIIfor EEE,	Mathematics		42	28	0	50	120	3	50	50	100	4
2	IPCC	1BEE302	AnalogElectronicsCircuits	EEE		42	0	28	50	120	3	50	50	100	4
3	PCC	1BEE303	ElectricCircuitAnalysis	EEE		42	28	0	50	120	3	50	50	100	4
4	PCC	1BEE304	DigitalElectronicsCircuits	EEE		42	0	0	48	90	3	50	50	100	3
5	PCC	1BEE305	TransformersandGenerators	EEE		42	0	0	48	90	3	50	50	100	3
6	PCCL	1BEEL306	TransformersandGenerators lab	EEE		0	0	28	2	30	2	50	50	100	1
7	AEC	1BEEL307x	AbilityEnhancementCourseLaboratory	EEE		0	0	28	2	30	2	50	50	100	1
8	SDC	1BCP308	CommunityProject(Project-BasedLearning)/SocietalProject	EEE		0	0	0	30	30	2	50	50	100	1
9	NCMC	1BNSS309	NationalServiceScheme(NSS)	Concernedcampus Staff.(CIE: Viva - Voceanddemonstrations	NSScoordinator	Theteaching–learningmethodologyshallbe alignedwith the specific nature ofeach subject, viz., NSS, PE,Yoga, and Music.			30	30	--	100	---	100	PP
		1BPE309	PhysicalEducation(PE)(SportsandAthletics)		PhysicalEducation Director										
		1BYOG309	Yoga		YogaTeacher										
		1BMUK309	Music		MusicTeacher										
Total(Incaseofregular students)										**660**	--	**500**	**400**	**900**	**21**
10	NCMC	1BMATDIP310	MathematicscourseforLateralEntry Students	Mathematics		14	0	0	16	30	---	100	---	100	PP
Total(Incaseoflateral-entrystudentsnotexemptedfromstudying1BMATDIP310)										**690**		**600**	**400**	**1000**	**21**

AbilityEnhancementCourse(Laboratory)

1BEEL307A	Multisim/PSpiceLabforCircuit Analysis	1BEEL307C	PythonProgramming
1BEEL307B	TransducersandSensorsLab	1BEE307D	DigitalElectronicsCircuitsLab

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IVSEMESTER

Sl. No	Courseand Course Code		CourseTitle	TeachingDepartment(TD)andQuestionPaperSettingBoard(PSB)	TeachingandLearning Scheme					Examination				Credits
					Classroom Instruction (CI)hours		Laboratory Instruction (LI)hours	Termwork&self-learninginhours	Teaching-Learninghourspersemester=CI+LI+TW+SL	Durationinhours	CIEMarks	SEEMarks	TotalMarks	
					L	T	P	TW+SL						
1	PCC	1BEE401	ElectricMotors	EEE	42	0	0	48	90	3	50	50	100	3
2	IPCC	1BEE402	Microcontroller	EEE	42	0	28	50	120	3	50	50	100	4
3	PCC	1BEE403	FieldTheory	EEE	42	28	0	50	120	3	50	50	100	4
4	PCC	1BEE404	TransmissionandDistribution	EEE	42	0	0	48	90	3	50	50	100	3
5	PCCL	1BEEL405	ElectricMotorsLab	EEE	0	0	28	02	30	2	50	50	100	1
6	AEC	1BEEL406	AbilityEnhancementCourseLaboratory	EEE	0	0	28	02	30	2	50	50	100	1
7	BSC	1BEE407	BiologyforElectricalEngineers	EEE	28	0	0	32	60	3	50	50	100	2
8	SDC	1BEP408	EnvironmentalScienceProject	EEE	0	0	0	30	30	3	50	50	100	1
9	PCC	1BEE409	ElectricPowerGenerationandEconomics	EEE	42	0	0	48	90	3	50	50	100	3
10	NCMC	1BNSK409	NationalServiceScheme (NSS)	Concernedcampus Staff.(CIE :Viva - Voce anddemonstration) NSScoordinator	Theteaching–learningmethodology shall bealigned with the specificnatureofeachsubject,viz.,NSS, PE, Yoga, and Music.				30	--	100	---	100	PP
		1BPEK409	PhysicalEducation(PE)(Sportsand Athletics)	Physical Education Director										
		1BYOK409	Yoga	YogaTeacher										
		1BMUS409	Music	MusicTeacher										
Total(Incaseofregularstudents)									**690**		**550**	**450**	**1000**	**22**
11	NCMC	1BMATDIP410	MathematicscourseforLateralEntry Students	MathematicsDept	14	0	0	16	30	--	100	--	100	PP
Total(Incaseoflateral-entrystudentsnotexemptedfromstudying1BMATDIP310)									**720**		**650**	**450**	**1100**	22

AbilityEnhancementCourse(Laboratory)

1BEEL406A	Audino,ARM&RaspberryPIBasedProjects	1BEEL406C	MATLAB
1BEEL406B	JavaProgramming	1BEEL406D	ElectricalMeasurementsLab

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VSEMESTER

Sl. No	CourseandCourseCode		CourseTitle	TeachingDepartment(TD)andQuestionPaperSettingBoard(PSB)	TeachingandLearning Scheme					Examination				Credits
					Classroom Instruction(CI)hours		Laboratory Instruction (LI)hours	Termwork&self-learninginhours	Teaching-Learninghourspersemester =CI+LI+TW+SL	Durationinhours	CIEMarks	SEEMarks	TotalMarks	
					L	T	P	TW+SL						
1	HSMC	1BEE501	EngineeringManagementand Entrepreneurship	EEE	42	0	0	48	90	3	50	50	100	3
2	IPCC	1BEE502	SignalsandDSP	EEE	42	0	28	50	120	3	50	50	100	4
3	PCC	1BEE503	PowerElectronics	EEE	42	0	0	48	90	3	50	50	100	3
4	PCC	1BEE504	Op-AmpandLIC	EEE	42	0	0	48	90	3	50	50	100	3
5	PEC	1BEE505x	ProfessionalElectiveCourse-I	EEE	42	0	0	48	90	3	50	50	100	3
6	BSC	1BRM506	ResearchMethodologyandIPR	EEE	28	0	0	32	60	02	50	50	100	2
7	PCCL	1BEEL507	PowerElectronicsLab	EEE	0	0	28	02	30	02	50	50	100	1
8	SDC	1BEE508	Hackathon-BasedProject	CIE:ByDepartments SEE: Evaluation by industryexperts	28	0	0	32	60	--	50	50	100	2
								Total	**630**		**400**	**400**	**800**	**21**

ProfessionalElectiveCourse-I

1BEE505A	HighVoltageEngineering	1BEE505C	ElectricalDrawing(CAD)
1BEE505B	IOTandEmbeddedsystems	1BEE505D	ProgrammableLogicControllers

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VISEMESTER

Sl. No	Courseand Course Code		CourseTitle	TeachingDepartment(TD)andQuestionPaperSettingBoard(PSB)	Teaching&LearningScheme					Examination				Credits
					ClassroomInstruction(CI)hours		LaboratoryInstruction(LI)hours	Termwork&self-learninginhours	Teaching-Learninghourspersemester=CI+LI+TW+SL	Durationinhours	CIEMarks	SEEMarks	TotalMarks	
					L	T	P	TW+SL						
1	IPCC	1BEE601	PowersystemAnalysis-I	EEE	42	28	0	50	120	3	50	50	100	4
2	PCC	1BEE602	ControlSystems	EEE	42	0	0	48	90	3	50	50	100	3
3	PCC	1BEE603	ElectricVehicleFundamentals	EEE	42	0	0	48	90	3	50	50	100	3
4	PCC	1BEE604	SwitchgearandProtection	EEE	42	0	0	48	90	3	50	50	100	3
5	PEC	1BEE605x	ProfessionalElectiveCourses-II	EEE	42	0	0	48	90	3	50	50	100	3
6	PCCL	1BEEL606	PCCLab	EEE	0	0	28	2	30	2	50	50	100	1
7	AEC	1BEEL607x	ControlSystemslab	EEE	0	0	28	2	30	2	50	50	100	1
8	SDC	1BEE608	CapstoneProject-PhaseI	EEE+concerned interdisciplinary staff/s,ifany.	42	0	0	48	90	3	100	--	100	3
9	NCMC	1BEE609	UniversalHumanValue	CIE:TD/PSB	1	0	0	0	30	--	100	---	100	PP
								Total	**660**		**550**	**350**	**900**	**21**

ProfessionalElectiveCourse-II

1BEE605A	IndustrialUtilizationofElectricalPower	1BEE605C	CyberSecurity
1BEE605B	FundamentalsofVLSI	1BEE605D	DroneTechnology

AbilityEnhancementCourseLaboratory

1BEEL607A	ProgrammableLogicControllersLab	1BEEL607C	IOTandEmbeddedsystemsLab
1BEEL607B	ProtectionandHighVoltage Lab	1BEEL607D	CyberSecurityLab

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VIISEMESTER(SwappableVIIandVIIISEMESTER)(SCHEME-A)

Sl. No	Courseand Course Code		CourseTitle	TeachingDepartment(TD)andQuestionPaperSettingBoard(PSB)	TeachingHours/Week				Teaching-Learninghoursper semester =CI+LI+TW+SL	Examination				Credits
					ClassroomInstruction(CI)hours		Laboratory Instruction (LI)hours	Termwork&self-learninginho		Durationinhours	CIEMarks	SEEMarks	TotalMarks	
					L	T	P	TW+SL						
1	IPCC	1BEE701	Powersystemanalysis-II	EEE	42	0	28	50	120	3	50	50	100	4
2	PEC	1BEE702x	ProfessionalElectiveCourse-III	EEE	42	0	0	48	90	3	50	50	100	3
3	PEC	1BEE703x	Professional ElectiveCourse-IV	EEE	42	0	0	48	90	3	50	50	100	3
4	OEC	1BEE704x	OpenElectiveCourse-I	EEE	42	0	0	48	90	3	50	50	100	3
5	SDC	1BEE705	CapstoneProject-Phase-II	EEE+concerned interdisciplinary staff/s,ifany.	0	0	0	210	210	3	100	100	200	7
6	NCMC	1BIKS706	IndianKnowledgeSystem	CIE:TD/PSB	28	0	0	2	30	---	100	--	100	PP
								Total	**630**	**--**	**400**	**300**	**700**	**20**

ProfessionalElectiveCourse-III(NPTELcourseofferedbyVTUOnlineportal)			
1BEE702A	PowerSystemOperationandControl	1BEE702C	AIApplicationstoPowerSystem
1BEE702B	FlexibleACTransmissionSystems(FACTS)	1BEE702D	ElectricVehicleMotors
ProfessionalElectiveCourse-IV(NPTELcourseofferedby VTUOnline portal)			
1BEE703A	UHVDCandUHVACTransmissionSystems	1BEE703C	BatteryManagementinElectricVehicles
1BEE703B	AIApplicationstoEVs	1BEE703D	VerilogandVHDL
OpenElectiveCourse-I(NPTELcourseofferedbyVTUOnline portal)			
1BEE704A	RenewableEnergySources	1BEE704C	EnergyAuditandConservation
1BEE704B	UtilizationOfElectricalPower	1BEE704D	ForeignLanguage(NPTEL/SWAYAM/onlineVTU)

B.E. in Electrical and Electronics Engineering
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Outcome-BasedEducation(OBE)andChoice-BasedCreditSystem(CBCS)(Effectivefromtheacademicyear2025-26)

VIIISEMESTER(SwappableVIIandVIIISEMESTER)(SCHEME-A)

Sl. No	CourseandCourseCode		CourseTitle	TeachingDepartment(TD)andQuestionPaperSettingBoard(PSB)	TeachingHours/Week				Teaching-Learninghours persemester=CI+LI+TW+SL	Examination				
					ClassroomInstruction(CI) hours		Laboratory Instruction (LI) hours	Termwork & self-learning in hours		Durationin hours	CIEMarks	SEEMarks	TotalMarks	Credits
1	PEC	1BEE801x	ProfessionalElective-V	CentreforOnlineEducation (COE),VTU	42	0	0	48	90	3	50	50	100	3
2	OEC	1BEE802x	OpenElective-II	COE,VTU	42	0	0	48	90	3	50	50	100	3
3	SDC	1BEE803x	Internship (Minimumof15weeks)	Viva-Voce:EEEfaculty+ Industry expert/s, or interdepartmentalfaculty	--				270	3	100	100	200	9
								Total	**450**	**--**	**200**	**200**	**400**	**15**

ProfessionalElectiveCourse-V(NPTEcourse offered byVTUOnlineportal)

1BEE801A		1BEE801C	
1BEE801B		1BEE801D	

OpenElective Courses -II(NPTEcourseofferedbyVTU Onlineportal)

1BEE802A		1BEE802C	
1BEE802B		1BEE802D	ForeignLanguage

TypesofInternships(CourseCode:1BEE803x)

Studentsshallundertakeoneofthefollowinginternshiptypesduringtheeighthsemester,asperacademicguidelines:

1. **1BEE803A–IndustryInternship**:Shallinvolvepracticalexposureandtrainingwithinanindustrialorcorporatesetting.
2. **1BEE803B–ResearchInternship**:Shallfocusonacademicorappliedresearchundertheguidanceoffacultyorresearchinstitutions.
3. **1BEE803C–Post-PlacementInternship**:Shallbeundertakenbystudentswhohavesecuredplacement,aligningwiththeirfutureemploymentdomain.
4. **1BEE803D–SocietalInternship**:Shallengagestudentsincommunity-basedorsocialimpactprojectswithNGOs,governmentbodies,orcivicorganizations.
5. **1BEE803E–OnlineInternship**:Shallbeconductedthroughrecognizeddigitalplatformsofferingstructuredinternshipmodules.
6. **1BEE803F–SkillEnhancementInternship:** Shallbeoptedbystudents unabletosecureinternships,offeringcreditequivalencethroughcuratedonlinecoursesavailable at http:// www.online.vtu.ac.in
7. **1BEE803G–AcademicTeachingInternship:**Shallbeoptedforbystudentsintendingtopursueteachingasaprofession.

To ensure uniformity, quality, and transparency in the internship process, VTU has launched a centralized web portal that serves as a single platform for all internship opportunities.Reputedindustries,CentersofExcellence,ResearchLaboratories,and otherrecognizedbodies willberegisteredonthis portal.Studentsmustchooseinternships exclusively through this portal. No other mode of internship selection will be permitted

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VIIandVIIIsemestersforthecandidateswhooptforatwo-semestersinternshipalongwithCapstoneProject(SchemeB)

AspiringstudentswhoareinterestedinundergoingatwO(02)-semesterinternshipprogrammeof30weeksmayoptforOptionBoftheIV-yearSchemeofTeachingandExaminations. However,theinternshipcreditsshallremainatnine(09),irrespectiveofthedurationoftheinternship.

Sl. No	Courseand CourseCode		CourseTitle	TeachingDepartment(TD)andQuestionPaperSettingBoard(PSB)	Teaching&LearningScheme				Teaching-Learninghours persemester =Cl+ LI+TW+SL	Examination				Credits
					Classroom Instruction (Cl) hours		Laboratory Instruction (LI)hours	Term work &self-learning in hours		Durationinhours	CIEMarks	SEEMarks	TotalMarks	
					L	T	P	TW+SL						
VII Semester														
1	IPCC	1BEE701	Powersystemanalysis-II [Students who optforScheme–Bshallcompulsorily registerforthecourseduringtheSummerSemester following the 6th semester.]	EEE	42	0	28	50	120	3	50	50	100	4
2	PEC	1BEE702x	ProfessionalElectiveCourse-III	Centre for Online Education(COE),VTU	42	0	0	48	90	3	50	50	100	3
3	PEC	1BEE703x	ProfessionalElectiveCourse-IV	COE,VTU	42	0	0	48	90	3	50	50	100	3
4	OEC	1BEE704x	OpenElectiveCourse-I	COE,VTU	42	0	0	48	90	3	50	50	100	3
5	SDC	1BEE705	CapstoneProject-Phase-II	EEE+concerned interdisciplinary staff/s, if any.	0	0	0	210	210	3	100	100	200	7
6	NCMC	1BIKS706	IndianKnowledgeSystem	CIE:TD/PSB	28	0	0	2	30	--	100	--	100	PP
								Total	**630**	**--**	**400**	**300**	**700**	**20**
VIII Semester														
1	PEC	1BEE801x	ProfessionalElective-V	COE,VTU	42	0	0	48	90	3	50	50	100	3
2	OEC	1BEE802x	OpenElective-II	COE,VTU	42	0	0	48	90	3	50	50	100	3
3	SDC	1BEE803x	Internship(Two-semesterinternshipforaminimum Period of 180 working days)	Viva-Voce: EEE + Industryexpert/s,or Interdepartmental faculty	--				540	3	50	50	100	9
								Total	**720**	**3**	**150**	**150**	**300**	**15**
													TotalCreditsof7th and8th semesters	**35**

ProfessionalElectiveCourse–III(NPTELcourseofferedbyVTUOnlineportal)			
1BEE702A		1BEE702C	
1BEE702B		1BEE702D	
NPTEL/VTU Online ProfessionalElectiveCourse–IV(NPTELcourseofferedbyVTUOnline portal)			
1BEE703A		1BEE703C	
1BEE703B		1BEE703D	
NPTEL/VTUOnlineOpenElectiveCourses-I(NPTELcourseofferedbyVTUOnlineportal)			
1BEE704A		1BEE704C	
1BEE704B		1BEE704D	
NPTEL/VTUOnline ProfessionalElectiveCourse-V(NPTELcourseofferedbyVTUOnlineportal)			
1BEE801A		1BEE801C	
1BEE801B		1BEE801D	
NPTEL/VTU OnlineOpenElectiveCourses-II(NPTELcourseofferedbyVTUOnlineportal)			
1BEE802A		1BEE802C	
1BEE802B		1BEE802D	ForeignLanguage

TypicaltypesofInternships(CourseCode:1BEE803)

Studentsshallundertakeoneofthefollowinginternshiptypesduringtheeighthsemester,asperacademicguidelines:

x. **1BEE803A–IndustryInternship**:Shallinvolvepracticalexposureandtrainingwithinanindustrialorcorporatesetting.

xi. **1BEE803B–ResearchInternship**:Shallfocusonacademicorappliedresearchundertheguidanceoffacultyorresearchinstitutions.

xii. **1BEE803C–Post-PlacementInternship**:Shallbeundertakenbystudentswhohavesecuredplacement,aligningwiththeirfutureemploymentdomain.

xiii. **1BEE803D–SocietalInternship**:Shallengagestudentsincommunity-basedorsocialimpactprojectswithNGOs,governmentbodies,orcivicorganizations.

xiv. **1BEE803E–OnlineInternship**:Shallbeconductedthroughrecognizeddigitalplatformsofferingstructuredinternshipmodules.

xv. **1BEE803F–SkillEnhancementCourses(SEC):** Shallbeoptedbystudentsunable tosecureinternships,offeringcreditequivalencethroughcuratedonlinecoursesavailable at http://www.online.vtu.ac.in

xvi. **1BEE803G–AcademicTeachingInternship:**Shallbeoptedforbystudentsintendingtopursueteachingasaprofession.

Toensureuniformity,quality,andtransparencyintheinternshipprocess,VTUhaslaunchedacentralizedwebportalthatservesasasingleplatformforallinternshipopportunities. Reputedindustries,Centres ofExcellence,ResearchLaboratories,and otherrecognizedbodieswill beregisteredonthisportal.Students mustchooseinternshipsexclusivelythrough this port other mode of internship selection will be permitted.