



NEHRU COLLEGE OF ENGINEERING AND RESEARCH CENTRE

(AN AUTONOMOUS INSTITUTION)

Pampady, Thiruvilwamala, Thrissur Dt., Kerala - 680588
NBA Accredited Programmes - B.Tech CSE, B.Tech MTR | NAAC Re-accredited with 'A' Grade
Recognized by UGC under Section(2f) of the UGC Act, 1956 | ISO 9001:2015 Certified
Approved by AICTE | Affiliated to APJ Abdul Kalam Technological University



AQAR

AY 2023-24

1.2.2 Number of Add on /Certificate programs offered during the year

1.2.3 Number of students enrolled in Certificate/ Add-On programs as against the total number of students during the year

Sl. No.	Description	Page No.
1	ADD – ON Details of Dept. of CSE (Request Letter, Circular, Course Syllabus, Attendance Report, Exam Details and Certificates – Samples)	1
2	ADD – ON Details of Dept. of ECE	51
3	ADD – ON Details of Dept. of EEE	80
4	ADD – ON Details of Dept. of ME	128
5	ADD – ON Details of Dept. of MTR	157
6	ADD – ON Details of Dept. of MBA	209
7	ADD – ON Details of Dept. of MCA	214



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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING Minutes of Department Advisory Committee Meeting held on 11.09.2023

AY 2023-24

A meeting of the Department Advisory Committee (DAC) was held on 11.09.2023 at 10:00 AM in the chamber of HOD, Dept. of CSE

The following members were present

1. Dr. Mredhula L (HOD, ECE_
2. Ms. Silja Varghese, HoD In Charge CSE
3. Mr. Vipin KM, Assistant Professor CSE
4. Ms. Sruthy MR, Assistant Professor CSE
5. Ms. Baby V, Assistant Professor CSE
6. Ms. Praveena K, Assistant Professor CSE
7. Ms. Smita Unnikrishnan, Assistant Professor CSE
8. Ms. Betsy Joy, Assistant Professor CSE

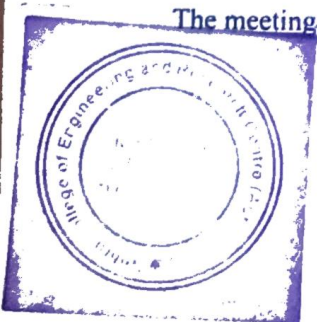
The following decisions were taken:

1. Decision was made to give practical knowledge to students in recent technologies. It was decided to conduct an ADD ON courses for ALL Semester B.Tech CSE starting from 18.09.2023 for 30 hours.

Sl. No.	Semester	Course Code and Course Name
1	ALL	VAC-CRYPTOGRAPHY AND BLOCKCHAIN TECHNOLOGIES

2. The course will be conducted during the allotted hours for ADD-ON course in the timetable. Students must register before 15.09.2023.
3. Staff Advisors of respective classes should ensure maximum participation and monitor the attendance.

The meeting came to an end at 10:30 AM



[Signature]
HOD, CSE

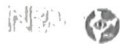
[Signature]
PRINCIPAL

Nehru College of Engineering and
Research Centre (Autonomous)
Nila Godeas, Pampady
Thiruvilwamala, Thrissur - 680588



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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Minutes of Department Advisory Committee Meeting held on 11.09.2023

AY 2023-24

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The following members were present

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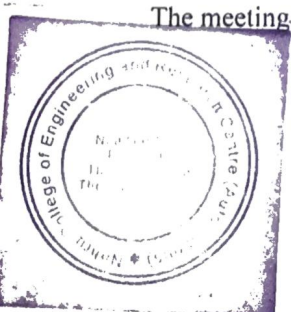
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HOD, CSE

PRINCIPAL
Nehru College of Engineering and
Research Centre (Autonomous)
Nila Garogas, Pampady
Thiruvilwamala, Thrissur - 680588

1. *Chlorophyll a* and *Chlorophyll b* contents were determined using a spectrophotometer (Shimadzu UV-160U) at 663 nm and 646 nm, respectively. The concentrations were expressed as mg/g of fresh weight.

2. 2. 2. 2. Request for information on the use of the

6. 5. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100. 101. 102. 103. 104. 105. 106. 107. 108. 109. 110. 111. 112. 113. 114. 115. 116. 117. 118. 119. 120. 121. 122. 123. 124. 125. 126. 127. 128. 129. 130. 131. 132. 133. 134. 135. 136. 137. 138. 139. 140. 141. 142. 143. 144. 145. 146. 147. 148. 149. 150. 151. 152. 153. 154. 155. 156. 157. 158. 159. 160. 161. 162. 163. 164. 165. 166. 167. 168. 169. 170. 171. 172. 173. 174. 175. 176. 177. 178. 179. 180. 181. 182. 183. 184. 185. 186. 187. 188. 189. 190. 191. 192. 193. 194. 195. 196. 197. 198. 199. 200. 201. 202. 203. 204. 205. 206. 207. 208. 209. 210. 211. 212. 213. 214. 215. 216. 217. 218. 219. 220. 221. 222. 223. 224. 225. 226. 227. 228. 229. 230. 231. 232. 233. 234. 235. 236. 237. 238. 239. 240. 241. 242. 243. 244. 245. 246. 247. 248. 249. 250. 251. 252. 253. 254. 255. 256. 257. 258. 259. 260. 261. 262. 263. 264. 265. 266. 267. 268. 269. 270. 271. 272. 273. 274. 275. 276. 277. 278. 279. 280. 281. 282. 283. 284. 285. 286. 287. 288. 289. 290. 291. 292. 293. 294. 295. 296. 297. 298. 299. 300. 301. 302. 303. 304. 305. 306. 307. 308. 309. 310. 311. 312. 313. 314. 315. 316. 317. 318. 319. 320. 321. 322. 323. 324. 325. 326. 327. 328. 329. 330. 331. 332. 333. 334. 335. 336. 337. 338. 339. 340. 341. 342. 343. 344. 345. 346. 347. 348. 349. 350. 351. 352. 353. 354. 355. 356. 357. 358. 359. 360. 361. 362. 363. 364. 365. 366. 367. 368. 369. 370. 371. 372. 373. 374. 375. 376. 377. 378. 379. 380. 381. 382. 383. 384. 385. 386. 387. 388. 389. 390. 391. 392. 393. 394. 395. 396. 397. 398. 399. 400. 401. 402. 403. 404. 405. 406. 407. 408. 409. 410. 411. 412. 413. 414. 415. 416. 417. 418. 419. 420. 421. 422. 423. 424. 425. 426. 427. 428. 429. 430. 431. 432. 433. 434. 435. 436. 437. 438. 439. 440. 441. 442. 443. 444. 445. 446. 447. 448. 449. 450. 451. 452. 453. 454. 455. 456. 457. 458. 459. 460. 461. 462. 463. 464. 465. 466. 467. 468. 469. 470. 471. 472. 473. 474. 475. 476. 477. 478. 479. 480. 481. 482. 483. 484. 485. 486. 487. 488. 489. 490. 491. 492. 493. 494. 495. 496. 497. 498. 499. 500. 501. 502. 503. 504. 505. 506. 507. 508. 509. 510. 511. 512. 513. 514. 515. 516. 517. 518. 519. 520. 521. 522. 523. 524. 525. 526. 527. 528. 529. 530. 531. 532. 533. 534. 535. 536. 537. 538. 539. 540. 541. 542. 543. 544. 545. 546. 547. 548. 549. 550. 551. 552. 553. 554. 555. 556. 557. 558. 559. 560. 561. 562. 563. 564. 565. 566. 567. 568. 569. 570. 571. 572. 573. 574. 575. 576. 577. 578. 579. 580. 581. 582. 583. 584. 585. 586. 587. 588. 589. 590. 591. 592. 593. 594. 595. 596. 597. 598. 599. 600. 601. 602. 603. 604. 605. 606. 607. 608. 609. 610. 611. 612. 613. 614. 615. 616. 617. 618. 619. 620. 621. 622. 623. 624. 625. 626. 627. 628. 629. 630. 631. 632. 633. 634. 635. 636. 637. 638. 639. 640. 641. 642. 643. 644. 645. 646. 647. 648. 649. 650. 651. 652. 653. 654. 655. 656. 657. 658. 659. 660. 661. 662. 663. 664. 665. 666. 667. 668. 669. 670. 671. 672. 673. 674. 675. 676. 677. 678. 679. 680. 681. 682. 683. 684. 685. 686. 687. 688. 689. 690. 691. 692. 693. 694. 695. 696. 697. 698. 699. 700. 701. 702. 703. 704. 705. 706. 707. 708. 709. 710. 711. 712. 713. 714. 715. 716. 717. 718. 719. 720. 721. 722. 723. 724. 725. 726. 727. 728. 729. 730. 731. 732. 733. 734. 735. 736. 737. 738. 739. 740. 741. 742. 743. 744. 745. 746. 747. 748. 749. 750. 751. 752. 753. 754. 755. 756. 757. 758. 759. 760. 761. 762. 763. 764. 765. 766. 767. 768. 769. 770. 771. 772. 773. 774. 775. 776. 777. 778. 779. 780. 781. 782. 783. 784. 785. 786. 787. 788. 789. 790. 791. 792. 793. 794. 795. 796. 797. 798. 799. 800. 801. 802. 803. 804. 805. 806. 807. 808. 809. 810. 811. 812. 813. 814. 815. 816. 817. 818. 819. 820. 821. 822. 823. 824. 825. 826. 827. 828. 829. 830. 831. 832. 833. 834. 835. 836. 837. 838. 839. 840.

STANLEY, PAUL J.

$\mathbb{C}$ $\mathbb{R}$ $\mathbb{Z}$ $\mathbb{N}$

1992-1993

24

PRINCIPAL
 1940-1941 (Engineering and
 Mechanical Engineering)
 1942-1943 (Engineering)
 1944-1945 (Engineering)

From

CSE department,
NCERC Pampady

TO

The Principal
NCERC Pampady

SUBJECT: Request for Conducting a Certificate Course, Reg.

Respected Sir,

Students need a deep understanding of upcoming methodologies to enhance the knowledge. So, computer science and engineering department would like to conduct a certificate course for all students. It will be a 30-hour course scheduled for this academic year 2023-2024. Kindly request you to give the permission for the same. The list of course name and course handling faculties are listed below. The syllabus of the individual course is attached for the reference.

Thank you for your consideration. I look forward for your response soon.

| SEMESTER | BATCH | COURSE NAME |
|----------|-------|--|
| ALL | A,B | CRYPTOGRAPHY AND
BLOCKCHAIN
TECHNOLOGIES |



Yours Sincerely,





PRINCIPAL
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Research Centre (Autonomous)
Nila Gardens, Pampady
Thiruvithamala, Thrissur - 680588

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Email : principal.ncerc.ac.in

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

ADMISSION TO ADD-ON-COURSE (2023-24)

Applications are invited for admission for the Add-on Course 'CRYPTOGRAPHY AND BLOCKCHAIN TECHNOLOGY' offered by the Department of Computer Science and Engineering, Nehru College of Engineering and Research Centre, Pampady, Thrissur.

Eligibility Criteria:

All Year UG Engineering students of CSE department are eligible. Interested students can give their names to respective class advisors on or before 10-09-2023.

Timing:

1 hour per day for 30 days. Saturday may be used at the discretion of the Department.

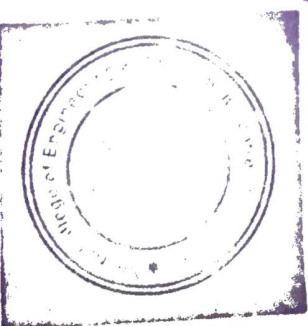
Attendance:

A minimum of 75% attendance is required for writing the examination.

Important Dates:

Commencement of Classes: 18-09-2023

Examination Date: 25-04-2024



A handwritten signature in blue ink, appearing to read "S. S. Suresh".

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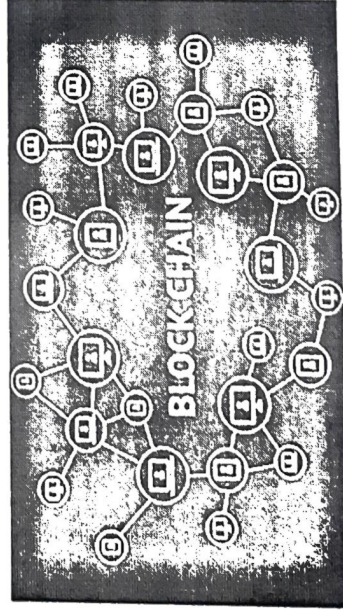
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

**About Cryptography and
blockchain technology**

Cryptography is a way of securing data against unauthorized access. In the blockchain, cryptography is used to secure transactions between two nodes in the blockchain network. As mentioned above, there are two main concepts in blockchain – cryptography and hashing. Cryptography encrypts messages in the P2P network while hashing helps secure block information and link blocks in the blockchain.

ADD ON COURSE

ON



Objective

The purpose of this course is to create awareness and understanding among students on the foundation of blockchain technology. The course introduces the cryptographic principles behind blockchain and helps the students understand concepts like consensus, crypto-currency, smart contracts, use cases etc. The course enables students to develop simple decentralize applications using blockchain networks such as Ethereum.

Important Dates:

Commencement of Classes :18-09-2023

Examination Date: 25-04-2024

Cordinator:

Asst Prof. Leya M S

Dept. of Computer Science & Engineering,

NCERC-Pambady

Mob. No.: +918078381995

Email: leya3945@ncerc.ac.in

Website: www.ncerc.ac.in




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COURSE NAME: CRYPTOGRAPHY AND BLOCK CHAIN TECHNOLOGIES
ATTENDANCE REGISTER OF ADD ON COURSE (2023 - 2024)
CLASS: S3 CSE A

| Reg No | Name | No. of Hours | | | | | | | | | | | | | | | |
|------------|--------------------|--------------|--------|--------|--------|-------|-------|-------|--------|--------|--------|-------|-------|-------|--------|--------|--------|
| | | Sep 18 | Sep 21 | Sep 23 | Sep 30 | Oct 5 | Oct 9 | Oct 9 | Oct 12 | Oct 16 | Oct 19 | Nov 2 | Nov 6 | Nov 9 | Nov 13 | Nov 13 | Nov 16 |
| NCE22CS001 | ABHINAV S | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE22CS002 | ABHISHA K J | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE22CS003 | ABHISHEK G | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE22CS004 | ABIJITH K | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE22CS005 | ABINAV K | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE22CS006 | ABIN T S | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE22CS007 | ABISHEK S | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE22CS008 | ADARSH S | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE22CS009 | ADHEEB V | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE22CS010 | ADITHYA HARIDAS | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE22CS011 | ADITHYA KRISHNAN P | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE22CS012 | ADITHYAN SHAJI E | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE22CS013 | ADVAIT RATHISH | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE22CS014 | AJMAL P | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE22CS015 | AJMAL P A | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE22CS016 | AKASH K M | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE22CS017 | AKASH K S | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |



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 Thiruvivamela, Thiruvananthapuram - 680548



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Resear. J. of Agric. (Autonomous)
Pula College, Pampady
Thiruvananthapuram, Thrissur - 680554



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Nehru College of Education and Research, Coimbatore (Maharashtra)

Research (Literature)

Nila Ganes, Pampam

Thuvilwamala, Thirakur - 611 001



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COURSE NAME: CRYPTOGRAPHY AND BLOCKCHAIN TECHNOLOGIES

ATTENDANCE REGISTER OF ADD ON COURSE (2023 - 2024)

CLASS :

| | | No. of Hours | | | | | | | | | | | | | | |
|------------|--------------------|--------------|---------|---------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Reg No | Name | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| | | Jan 16 | Feb. 17 | Feb. 18 | Feb. 19 | Feb 20 | Feb 21 | Mar 22 | Mar 23 | Mar 24 | Mar 25 | Mar 26 | Apr 27 | Apr 28 | Apr 29 | Apr 30 |
| NCE22CS001 | ABHINAV S | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | A | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE22CS002 | ABHISHA K J | ✓ | A | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE22CS003 | ABHISHEK G | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | A. |
| NCE22CS004 | ABIJITH K | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | A | ✓ | ✓ |
| NCE22CS005 | ABINAV K | ✓ | ✓ | A | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE22CS006 | ABIN T S | ✓ | ✓ | ✓ | ✓ | ✓ | A | ✓ | A | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE22CS007 | ABISHEK S | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE22CS008 | ADARSH S | ✓ | ✓ | ✓ | ✓ | A | ✓ | ✓ | ✓ | A | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE22CS009 | ADHEEB V | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | A | ✓ | ✓ | ✓ | ✓ |
| NCE22CS010 | ADITHYA HARIDAS | ✓ | ✓ | ✓ | A | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE22CS011 | ADITHYA KRISHNAN P | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE22CS012 | ADITHYAN SHAU E | A | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | A | ✓ |
| NCE22CS013 | ADVAIT RATHISH | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE22CS014 | AJMAL P | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | A | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE22CS015 | AJMAL P A | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | A | ✓ | ✓ | ✓ |
| NCE22CS016 | AKASH K M | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE22CS017 | AKASH M S | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | A |

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Email : principal.ncerc.ac.in

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Principal

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References

Nile Gardens, Pampas
71-1401-6605 RR

Nile Gardens, Pampas
71-1401-6605 RR



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[illegible]

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**Department of Engineering and
Research Centre (Autonomous)
Nile Gardens, Parnaby
Thiruvananthapuram**



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COURSE NAME: CRYPTOGRAPHY AND BLOCKCHAIN TECHNOLOGIES

ATTENDANCE REGISTER OF ADD ON COURSE (2023 - 2024)

CLASS: 63- CSE - B

No. of Hours

| Reg No | Name | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|------------|---------------------|--------|--------|--------|--------|-------|--------|--------|--------|--------|--------|-------|-------|-------|--------|--------|
| | | Sep 19 | Sep 22 | Sep 25 | Sep 29 | Oct 5 | Oct 10 | Oct 10 | Oct 12 | Oct 14 | Oct 19 | Nov 5 | Nov 6 | Nov 9 | Nov 14 | Nov 15 |
| NCE22CS059 | GISHAL S | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE22CS061 | HANZIL K H | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE22CS062 | HARINANDANA P | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE22CS063 | HARINANDANA V A | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE22CS064 | UAS AHAMMED N | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE22CS065 | INARA BASHEER | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE22CS066 | JISHON JACOB | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE22CS067 | JISS JOHNY | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE22CS068 | JOSEPH SIBY | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE22CS069 | JOYAL SAJI | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE22CS070 | KEERTHANA SURESH | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE22CS071 | KHADEEJA SHABEER | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE22CS072 | K M GOPIKA | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE22CS073 | KRISHNENDU K V | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE22CS074 | MINSIYAMOL M | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE22CS075 | MOHAMMED FIRHAZ F M | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

Principal

Responsible for (Autonomous)
NCE22CS075, Pampady
Thiruvivernam, Tiruvallur - 601304



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ATTENDANCE REGISTER OF ADD ON COURSE (2023 - 2024)

COURSE NAME:

CYBER SECURITY AND BLOCK CHAIN TECHNOLOGIES

CLASS: 53 CSE - B

No. of Hours

| Reg No | Name | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
|------------|--------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | Jan | Feb | Feb | Feb | Feb | Feb | Mar | Mar | Mar | Mar | Mar | Apr | Apr | Apr | Apr |
| NCL20CS059 | GISHA S | 30 | 6 | 13 | 16 | 20 | 23 | 12 | 13 | 20 | 27 | 27 | 5 | 9 | 13 | 17 |
| NCL20CS001 | HANZEL R H | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCL20CS002 | HAJINANDANA P | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCL20CS003 | HAJINANDANA V A | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCL20CS004 | HAJ AHAMMED N | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCL20CS005 | HAJAN BASHIR | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCL20CS006 | HISHON JACOB | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCL20CS007 | HIS JOHNY | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCL20CS008 | JOSEPH SIBY | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCL20CS009 | JONAS SADI | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCL20CS010 | HAJINANDANA SURESH | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCL20CS011 | HAJINANDANA SURESH | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCL20CS012 | HAJINANDANA SURESH | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCL20CS013 | HAJINANDANA SURESH | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCL20CS014 | HAJINANDANA SURESH | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCL20CS015 | HAJINANDANA SURESH | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |



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COURSE NAME:

CRYPTOGRAPHY AND BLOCKCHAIN TECHNOLOGIES

ATTENDANCE REGISTER OF ADD ON COURSE (2023 - 2024)

CLASS : 57-CSE-B

| Reg No | Name | No. of Hours | | | | | | | | | | | | | | |
|------------|---------------------|--------------|-----|-----|-----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| NCE20CS045 | GOPIKA SREETH | Aug | Aug | Aug | Aug | Sp | Sp | Oct | Oct | Oct | Oct | Oct | Nov | Nov | Nov | Nov |
| NCE20CS046 | GOUTHAM KRISHNA C M | 9 | 16 | 23 | 30 | 8 | 8 | 15 | 16 | 27 | 28 | 28 | 2 | 2 | 9 | 10 |
| NCE20CS047 | HABIN C BINNY | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| NCE20CS048 | HARIKRISHNAN C N | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| NCE20CS049 | HARIKRISHNAN K | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| NCE20CS050 | HEMENTH J | a | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| NCE20CS051 | IRFAN K N | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| NCE20CS052 | JISHA P B | X | X | X | X | a | X | X | X | X | X | X | X | X | X | X |
| NCE20CS053 | JYOTHIRADITHYA M | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| NCE20CS054 | KAILAS K | X | a | X | X | X | X | X | X | X | X | X | X | X | X | X |
| NCE20CS055 | KRISHNA ANAND | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| NCE20CS056 | LERIESHA S MATHEW | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| NCE20CS057 | MABLE SEBASTIAN | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| NCE20CS058 | MAYA M | X | a | X | X | X | X | X | X | X | X | X | X | X | X | X |
| NCE20CS059 | MOHAMMED SABIQ | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| NCE20CS060 | MUHAMMED RAMEEZ CA | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| NCE20CS061 | NANDAJA P G | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| NCE20CS062 | NANDAN K | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |

Principal

Neeru College of Engineering and Research Centre (Autonomous)

Mile 01, S.S. Road, Chennai

Phone: 044-2651-1111



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COURSE NAME: CRYPTOGRAPHY AND BLOCKCHAIN TECHNOLOGIES

ATTENDANCE REGISTER OF ADD ON COURSE (2023 - 2024)

CLASS: ST-CSE-B

| Reg No | Name | No. of Hours | | | | | | | | | | | |
|------------|---------------------|--------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 |
| | | Dec | Dec | Feb | Feb | Feb | Feb | Mar | Mar | Mar | Mar | Mar | Mar |
| NCE20CS045 | GOPIKA SREEJITH | X | X | X | X | X | X | X | X | X | X | X | X |
| NCE20CS046 | GOUTHAM KRISHNA C M | X | X | X | X | X | X | X | X | X | X | X | X |
| NCE20CS047 | HABIN C BINJOY | X | X | X | X | X | X | X | X | X | X | X | X |
| NCE20CS048 | HARIKRISHNAN C N | X | X | X | X | X | X | X | X | X | X | X | X |
| NCE20CS049 | HARIKRISHNAN K | X | X | X | X | X | X | X | X | X | X | X | X |
| NCE20CS050 | HEMENTH J | X | X | X | X | X | X | X | X | X | X | X | X |
| NCE20CS051 | IRFAN K N | X | X | X | X | X | X | X | X | X | X | X | X |
| NCE20CS052 | JISHA P B | X | X | X | X | X | X | X | X | X | X | X | X |
| NCE20CS053 | JYOTHIRADITHYA M | X | X | X | X | X | X | X | X | X | X | X | X |
| NCE20CS054 | KAILAS K | X | X | X | X | X | X | X | X | X | X | X | X |
| NCE20CS055 | KRISHNA ANAND | X | X | X | X | X | X | X | X | X | X | X | X |
| NCE20CS056 | LERIESHA S MATHEW | X | X | X | X | X | X | X | X | X | X | X | X |
| NCE20CS057 | MABLE SEBASTIAN | X | X | X | X | X | X | X | X | X | X | X | X |
| NCE20CS058 | MAYA M | X | X | X | X | X | X | X | X | X | X | X | X |
| NCE20CS059 | MOHAMMED SABIQ | X | X | X | X | X | X | X | X | X | X | X | X |
| NCE20CS060 | MUHAMMED RAMEEZ C A | X | X | X | X | X | X | X | X | X | X | X | X |
| NCE20CS061 | NANDAJA P G | X | X | X | X | X | X | X | X | X | X | X | X |
| NCE20CS062 | NANDAN K | X | X | X | X | X | X | X | X | X | X | X | X |

Principal
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COURSE NAME:

CRYPTOGRAPHY AND BLOCKCHAIN TECHNOLOGIES

CLASS:

S7 - CSE - A

ATTENDANCE REGISTER OF ADD ON COURSE (2023 - 2024)

No. of Hours

| Reg No | Name | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|------------|---------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | Aug | Aug | Aug | Aug | Sep | Sep | Oct | Oct | Oct | Oct | Oct | Nov | Nov | Nov | Dec |
| NCE20CS001 | AARATHI P | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE20CS002 | ABHIJITH GIRISH K | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE20CS003 | ABHILASH H | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE20CS004 | ABIJITH S | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE20CS005 | ADARSH P K | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE20CS006 | ADITHYA | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE20CS007 | ADITHYAN V | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE20CS008 | ADITYA P | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE20CS009 | AJAY KRISHNA C S | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE20CS010 | AJAY P | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE20CS011 | AKASH S | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE20CS012 | AKSHARA C S | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE20CS013 | AKSHAY KRISHNAN K M | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE20CS014 | AKSHAY T | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE20CS015 | AMAL P D | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE20CS016 | ANAND M | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE20CS017 | ANAND M | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE20CS018 | ANANTHU K | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

Principal

Head of Institute

Research Centre

(Autonomous)

Thiruvilwamala, Thrissur - 686 015

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COURSE NAME:

CRYPTOGRAPHY AND BLOCK CHAIN TECHNOLOGIES

ATTENDANCE REGISTER OF ADD ON COURSE (2023 - 2024)

CLASS: ST - CSE - A

No. of Hours

| Reg No | Name | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
|------------|---------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | Dec | Dec | Feb | Feb | Feb | Feb | Mar | Mar | Mar | Mar | Mar | Mar | Apr | Apr | Apr |
| NCE20CS001 | AARATHI P | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE20CS002 | ABHIJITH GIRISH K | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE20CS003 | ABHILASH H | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE20CS004 | ABHIJITH S | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE20CS005 | ADARSH P K | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE20CS006 | ADITHYA | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE20CS007 | ADITHYAN V | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE20CS008 | ADITYA P | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE20CS009 | AJAY KRISHNA C S | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE20CS010 | AJAY P | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE20CS011 | AKASH S | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE20CS012 | AKSHARA C S | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE20CS013 | AKSHAY KRISHNAN K M | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE20CS014 | AKSHAY T | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE20CS015 | AMAL P D | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE20CS016 | ANAND M | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE20CS017 | ANAND M | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NCE20CS018 | ANANTHU K | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

PRINCIPAL

Head of Institution of Engineering and Technology

Mila Gardens, Pampay
Thiruvalluvar, Tirunelveli - 626001

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COURSE NAME:

CRYPTOGRAPHY AND BLOCKCHAIN TECHNOLOGIES

ATTENDANCE REGISTER OF ADD ON COURSE (2023 - 2024)

CLASS :

SS - CSE - A

| Reg No | Name | No. of Hours | | | | | | | | | | | | | | |
|------------|----------------------|--------------|----|----|----|---|---|---|----|----|----|----|----|----|----|----|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| NCE21CS001 | ABDUL HARIS H | 18 | 18 | 21 | 25 | 5 | 5 | 9 | 12 | 16 | 2 | 6 | 6 | 9 | 2 | 2 |
| NCE21CS002 | ABHIJITH R | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| NCE21CS003 | ABHIJITH S | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| NCE21CS004 | ABHILASH U P | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| NCE21CS005 | ABHINAV BABU | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| NCE21CS006 | ABHINAV SHAJI | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| NCE21CS007 | ABHISHEK K | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| NCE21CS008 | ABHISHEK R | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| NCE21CS009 | ADHARSH P K | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| NCE21CS010 | ADITHYAN R | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| NCE21CS011 | ADITHYAN S | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| NCE21CS012 | AISWARAYA A P | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| NCE21CS013 | AKASH ANILKUMAR M | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| NCE21CS014 | AKASH ASHOK | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| NCE21CS015 | AKASH K | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| NCE21CS016 | AKSHAY G | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| NCE21CS017 | AKSHAY MUTTIVACHERRY | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

PRINCIPAL

Neeru College of Engineering and Research Centre (Autonomous)

Nile Gardens, Pampam,

Thiruvananthapuram, Thiruvananthapuram

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Acharya College of Engineering
 Research Centre (Autonomous)
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 Thiruvillamkudal, Thiruvur - 600088



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COURSE NAME:

CRYPTOGRAPHY AND BLOCKCHAIN TECHNOLOGIES

CLASS :

ATTENDANCE REGISTER OF ADD ON COURSE (2023 - 2024)

| Reg No | Name | No. of Hours | | | | | | | | | | | |
|------------|----------------------|--------------|----|----|----|----|----|----|----|----|----|----|----|
| | | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 |
| NCE21CS001 | ABDUL HARIS H | / | / | / | / | A | A | / | / | / | / | / | / |
| NCE21CS002 | ABHILITH R | / | / | / | / | / | / | / | / | / | / | / | / |
| NCE21CS003 | ABHILITH S | / | / | / | / | / | / | / | / | / | / | / | / |
| NCE21CS004 | ABHILASH U P | / | / | / | / | / | / | / | / | / | / | / | / |
| NCE21CS005 | ABHINAV BABU | / | / | / | / | / | / | / | / | / | / | / | / |
| NCE21CS006 | ABHINAV SHAU | / | / | / | / | / | / | / | / | / | / | / | / |
| NCE21CS007 | ABHISHEK K | / | / | / | / | / | / | / | / | / | / | / | / |
| NCE21CS008 | ABHISHEK R | / | / | / | / | / | / | / | / | / | / | / | / |
| NCE21CS009 | ADHARSH P K | / | / | / | / | / | / | / | / | / | / | / | / |
| NCE21CS010 | ADITHYAN R | / | / | / | / | / | / | / | / | / | / | / | / |
| NCE21CS011 | ADITHYAS | / | / | / | / | / | / | / | / | / | / | / | / |
| NCE21CS012 | AISWARAYA A P | / | / | / | / | / | / | / | / | / | / | / | / |
| NCE21CS013 | AKASH ANILKUMAR M | / | / | / | / | / | / | / | / | / | / | / | / |
| NCE21CS014 | AKASH ASHOK | / | / | / | / | / | / | / | / | / | / | / | / |
| NCE21CS015 | AKASH K | / | / | / | / | / | / | / | / | / | / | / | / |
| NCE21CS016 | AKSHAY G | / | / | / | / | / | / | / | / | / | / | / | / |
| NCE21CS017 | AKSHAY MUTTIVACHERRY | / | / | / | / | / | / | / | / | / | / | / | / |

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COURSE NAME:

CRYPTOGRAPHY AND BLOCK CHAIN TECHNOLOGIES

CLASS: SS - CSE - B

ATTENDANCE REGISTER OF ADD ON COURSE (2023 - 2024)

| Reg No | Name | No. of Hours | | | | | | | | | | | | | | |
|------------|-----------------|--------------|--------|--------|--------|-------|-------|-------|--------|--------|-------|-------|-------|-------|--------|-------|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| | | Sep 18 | Sep 18 | Sep 21 | Sep 25 | Oct 5 | Oct 5 | Oct 9 | Oct 12 | Oct 16 | Nov 2 | Nov 6 | Nov 6 | Nov 9 | Nov 14 | Dec 2 |
| NCE23CS057 | NAJMU HUDHA P A | X | X | X | X | a | X | X | X | X | X | X | X | X | X | X |
| NCE23CS058 | NAMRATHA P | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| NCE23CS059 | NANDHANAS | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| NCE23CS060 | NAWAL AKBER | X | X | a | X | X | X | X | X | X | X | X | X | X | X | X |
| NCE23CS061 | NEHA N | a | X | X | a | X | X | X | X | X | X | X | X | X | X | X |
| NCE23CS062 | NIDHISH C R | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| NCE23CS063 | NIKHIL T S | X | a | X | X | X | X | X | X | X | a | X | X | X | X | X |
| NCE23CS064 | NITHA N | X | X | X | a | X | X | X | X | X | X | X | X | X | X | X |
| NCE23CS065 | NITHYA T K | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| NCE23CS066 | PADIMA P | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| NCE23CS067 | POOJA RAJEEV | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| NCE23CS068 | PRATHIP | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| NCE23CS069 | P S SATHI | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| NCE23CS070 | RAJAN A | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| NCE23CS071 | RAJASHAD A | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| NCE23CS072 | RASHIDA C K | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| NCE23CS073 | RESHMA S | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |

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ATTENDANCE REGISTER OF ADD ON COURSE (2023 - 2024)

COURSE NAME:

CRYPTOGRAPHY AND BLOCKCHAIN TECHNOLOGIES

CLASS:

| Reg No | Name | No. of Hours | | | | | | | | | | | | | | |
|------------|-------------------|--------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| | | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| NCE21CS057 | NAJMUL HUDDHA P A | 30 | 30 | 6 | 6 | 13 | 16 | 23 | 12 | 13 | 20 | 27 | 27 | 9 | 13 | 17 |
| NCE21CS058 | NAMRATHA P | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| NCE21CS059 | NANDHANAS | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| NCE21CS060 | NAWAL AKBER | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| NCE21CS061 | NEHA N | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| NCE21CS062 | NIDHISH C R | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| NCE21CS063 | NIKHIL T S | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| NCE21CS064 | NITHA N | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| NCE21CS065 | NITHYA T K | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| NCE21CS066 | PADMA P | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| NCE21CS067 | POOJA RAJEEV | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| NCE21CS068 | PRAJITH P | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| NCE21CS069 | P S SWATHI | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| NCE21CS070 | RAHANA | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| NCE21CS071 | RAMSHAD A | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| NCE21CS072 | RASHIDA C K | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| NCE21CS073 | RESHMA S | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |

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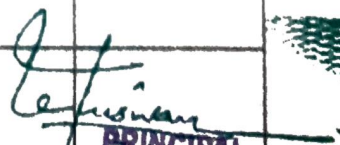
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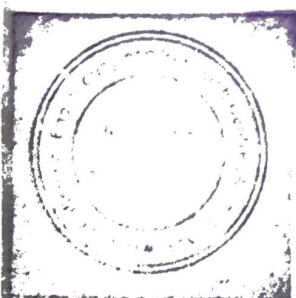
VALUE ADDED COURSE SYLLABUS

SUBJECT: CRYPTOGRAPHY AND BLOCKCHAIN TECHNOLOGY

| SL. NO. | TOPIC | TOTAL NO. OF HOURS | WEIGHTAGE OF MARKS (IN %) |
|---------|--|--------------------|---------------------------|
| I | Introduction to Cryptography, Symmetric cryptography – AES. Asymmetric cryptography – RSA. Elliptic curve cryptography. Digital signatures – RSA digital signature algorithms. Secure Hash Algorithms – SHA-256. Applications of cryptographic hash functions – Merkle trees. Distributed hash tables. | 10 | 30% |
| II | Blockchain – Definition, architecture, elements of blockchain, benefits and limitations, types of blockchain. Consensus – definition, types, consensus in blockchain. Decentralization – Decentralization using blockchain, Methods of decentralization, Routes to decentralization, Blockchain and full ecosystem decentralization. | 10 | 30% |
| III | Consensus Algorithms, Crash fault-tolerance (CFT) algorithms – Paxos, Raft. Byzantine fault-tolerance (BFT) algorithms – Practical Byzantine Fault Tolerance (PBFT), Proof of work (PoW), Proof of stake (PoS), Types of PoS. Bitcoin – Definition, Cryptographic keys – Private keys, public keys, addresses. | 10 | 40% |


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| | | | |
|--|---|--|--|
| | <p>Transactions –</p> <p>Lifecycle, coinbase transactions, transaction validation. Blockchain – The genesis block</p> <p>Mining – Tasks of miners, mining algorithm, hash rate. Wallets – Types of wallets.</p> | | |
|--|---|--|--|



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ADD-ON EXAMINATION

1. Blockchain is a peer-to-peer _____ distributed ledger technology that makes the records of any digital asset transparent and unchangeable.

- A. Decentralized
- B. Demanding
- C. Secure
- D. Popular

2. Blockchain networks are much _____ and deal with no real single point of failure.

- A. Simpler
- B. Easier to scale
- C. Convenient
- D. Faster

3. Bitcoin is a cryptocurrency, which is an application of Blockchain.

- A. True
- B. False

4. What does P2P stand for?

- A. Peer to Peer
- B. Product to Product
- C. Password to Password
- D. None of the above

5. Did Blockchain enable a centralized or a decentralized system for the exchange of value?

- A. Decentralized
- B. Centralized
- C. None of the above
- D. Can't say

6. What is Blockchain?

- A. A currency



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- B. A ledger
- C. A type of currency
- D. A distributed ledger on a peer-to-peer network

7. Bitcoin is based on _____ blockchain.

- A. Private
- B. Public
- C. Public Permissioned
- D. Permissioned

8. Smart Contract characteristics do not include:

- A. Alterable
- B. Fast and cost-effective
- C. A high degree of accuracy
- D. Transparency

9. Which of the following is not a type of symmetric-key cryptography technique?

- a. Caesar cipher
- b. Data Encryption Standard (DES)
- c. Diffie Hellman cipher
- d. Playfair cipher

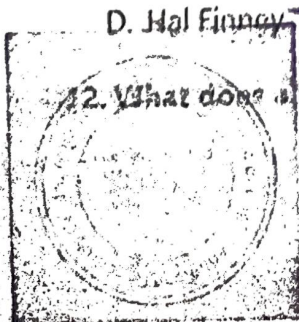
10. Blockchain has ____ versions.

- A. 2
- B. 3
- C. 4
- D. 5

11. Who introduced the digital online cryptocurrency known as Bitcoin?

- A. Satoshi Nakamoto
- B. Nick Szabo
- C. Wei Dai
- D. Hal Finney

12. What does a block in a Blockchain have?




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- A. Header & Digital ledger
- B. Bitcoins & Input
- C. Transactions & Bitcoins
- D. Header & Transaction

13. Smart Contract characteristics do not include:

- A. Alterable
- B. Fast and cost-effective
- C. A high degree of accuracy
- D. Transparency

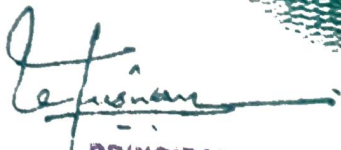
14. The transaction Merkle Tree root value in a Bitcoin block is calculated using,

- A. Hash of transactions
- B. Previous block's hash
- C. Number of transactions
- D. None of the above

15. What is a DApp?

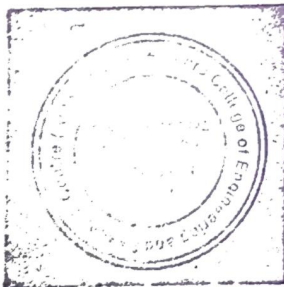
- A. A type of cryptocurrency
- B. A condiment
- C. A type of blockchain
- D. A decentralized application




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ANSWER KEY

- 1) A) Decentralized
- 2) B) Easier to scale
- 3) A) True
- 4) A) Peer to Peer
- 5) A) Decentralized
- 6) D) A distributed ledger on a peer-to-peer network
- 7) B) Public
- 8) A) Alterable
- 9) c) Diffie Hellman cipher
- 10) B) 3
- 11) A) Satoshi Nakamoto
- 12) D) Header & Transaction
- 13) D) All the above
- 14) A) Hash of transactions
- 15) D) A decentralized application



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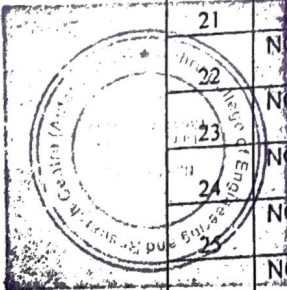
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Add on course Mark List

| Sl.No | Register.No | Name | Marks out of 30 |
|-------|-------------|---------------------|-----------------|
| 1 | NCE20CS001 | AARATHI P | 28 / 30 |
| 2 | NCE20CS002 | ABHIJITH GIRISH K | 26 / 30 |
| 3 | NCE20CS003 | ABHILASH H | 26 / 30 |
| 4 | NCE20CS004 | ABIJITH S | 27 / 30 |
| 5 | NCE20CS005 | ADARSH P K | 28 / 30 |
| 6 | NCE20CS006 | ADITHYA | 30 / 30 |
| 7 | NCE20CS007 | ADITHYAN V | 30 / 30 |
| 8 | NCE20CS008 | ADITYA P | 26 / 30 |
| 9 | NCE20CS009 | AJAY KRISHNA C S | 24 / 30 |
| 10 | NCE20CS010 | AJAY P | 24 / 30 |
| 11 | NCE20CS011 | AKASH S | 29 / 30 |
| 12 | NCE20CS012 | AKSHARA C S | 27 / 30 |
| 13 | NCE20CS013 | AKSHAY KRISHNAN K M | 28 / 30 |
| 14 | NCE20CS014 | AKSHAY T | 28 / 30 |
| 15 | NCE20CS015 | AMAL P D | 19 / 30 |
| 16 | NCE20CS016 | ANAND M | 26 / 30 |
| 17 | NCE20CS017 | ANAND M | 28 / 30 |
| 18 | NCE20CS018 | ANANTHU K | 28 / 30 |
| 19 | NCE20CS019 | ANASWARA C | 29 / 30 |
| 20 | NCE20CS020 | ANEK SEKHAR P | 26 / 30 |
| 21 | NCE20CS021 | ANIRUDHAN P | 23 / 30 |
| 22 | NCE20CS022 | ANIRUDHAN P M | 26 / 30 |
| 23 | NCE20CS023 | ANJALI NANDANA V P | 25 / 30 |
| 24 | NCE20CS024 | ANJANA CHANDRAN | 26 / 30 |
| 25 | NCE20CS025 | ANUGRAH K | 28 / 30 |
| 26 | NCE20CS026 | ANUPAMA K A | 21 / 30 |



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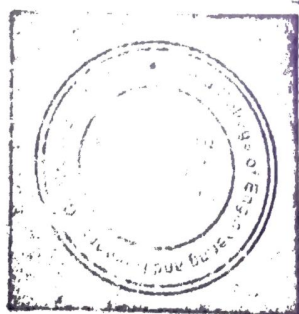
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| 27 | NCE20CS027 | ANUSREE K G | 27 / 30 |
| 28 | NCE20CS028 | APARNA V P | 26 / 30 |
| 29 | NCE20CS029 | ARCHANA C S | 20 / 30 |
| 30 | NCE20CS030 | ARJUN K | 21 / 30 |
| 31 | NCE20CS031 | ARYA K P | 28 / 30 |
| 30 | NCE20CS032 | ASHVIN SIBI | 26 / 30 |
| 33 | NCE20CS033 | ASHWIN C | 25 / 30 |
| 34 | NCE20CS034 | ASHWIN MOHAN | 26 / 30 |
| 35 | NCE20CS035 | ASWATHI K M | 28 / 30 |
| 36 | NCE20CS036 | ASWATH V | 21 / 30 |
| 37 | NCE20CS037 | ASWINDAS C H | 27 / 30 |
| 38 | NCE20CS038 | AVINASH M P | 26 / 30 |
| 39 | NCE20CS039 | BASIL P SUNNY | 20 / 30 |
| 40 | NCE20CS040 | C S GIRISH | 21 / 30 |
| 41 | NCE20CS041 | C SWETHA | 18 / 30 |
| 42 | NCE20CS042 | DANIEL SURESH | 26 / 30 |
| 43 | NCE20CS043 | DEEPAK K | 25 / 30 |
| 44 | NCE20CS044 | DITNA S | 26 / 30 |



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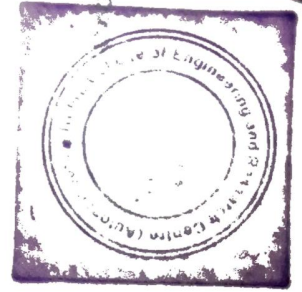
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Program Coordinator

Head of Department

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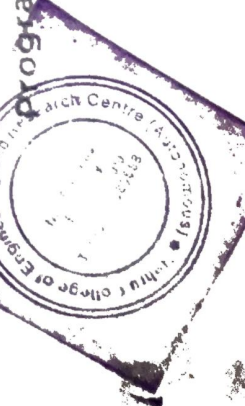
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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Minutes of Department Advisory Committee Meeting held on 08.09.2023

AY 2023-24 | ODD Semester

A meeting of the Department Advisory Committee (DAC) was held on 08.09.2023 at 3:00 PM in the chamber of HOD, Dept. of ECE.

The following members were present

1. Dr. Mredhula L (HOD, ECE)
2. Ms. Sajitha A S (Asst. Professor, ECE)
3. Ms. Kiran M (Asst. Professor, ECE)
4. Mr. Rajkumar P (Asst. Professor, ECE)
5. Mr. Vishnu Prabha N Kaimal (Asst. Professor, ECE)
6. Ms. Lisa C (Asst. Professor, ECE)
7. Ms. Anooja B (Asst. Professor, ECE)
8. Ms. Rachel Stefna Angeline A (Asst. Professor, ECE)

The following decisions were taken:

1. Decision was made to give practical knowledge to students in recent technologies. It was decided to conduct an ADD ON courses for ODD Semester B.Tech ECE starting from 18.09.2023 for 30 hours.

| Sl. No. | Semester | Course Code and Course Name | Course Coordinator |
|---------|----------|--|----------------------------|
| 1 | I | VAC-S1 Arduino using TINKER CAD | Ms. Anooja B |
| 2 | III | VAC-S3 Familiarization of Verilog/VHDL | Mr. Vishnu Prabha N Kaimal |
| 3 | V | VAC-S5 Internet of Things | Ms. Sajitha A S |
| 4 | VII | VAC-S7 Raspberry Pi | Mr. Vysak Valsan |

2. The course will be conducted during the allotted hours for ADD-ON course in the timetable. Students must register before 15.09.2023.
3. Staff Advisors of respective classes should ensure maximum participation and monitor the attendance.

The meeting came to an end at 3:50 PM




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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Minutes of Department Advisory Committee Meeting held on 15.01.2024

AY 2023-24 | EVEN Semester

A meeting of the Department Advisory Committee (DAC) was held on 15.01.2024 at 10:00 AM in the chamber of HOD, Dept. of ECE.

The following members were present

1. Dr. Mredhula L (HOD, ECE)
2. Mr. Jithin Jose Kallada (Asst. Professor, ECE)
3. Ms. Kiran M (Asst. Professor, ECE)
4. Mr. Rajkumar P (Asst. Professor, ECE)
5. Mr. Vishnu Prabha N Kaimal (Asst. Professor, ECE)
6. Ms. Lisa C (Asst. Professor, ECE)
7. Ms. Anooja B (Asst. Professor, ECE)
8. Ms. Rachel Stefna Angeline A (Asst. Professor, ECE)

The following decisions were taken:

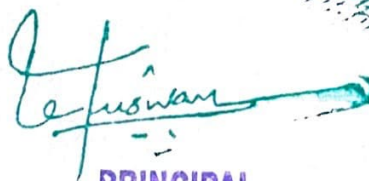
1. Decision was made to give practical knowledge to students in recent technologies. It was decided to conduct an ADD ON courses for EVEN Semester B.Tech ECE starting from 29.01.2024 for 30 hours.

| Sl. No. | Semester | Course Code and Course Name | Course Coordinator |
|---------|----------|---------------------------------------|------------------------------|
| 1 | II | VAC-S2 Foundations of Python | Ms. Rachel Stefna Angeline A |
| 2 | IV | VAC-S4 Logic Design using Virtual Lab | Mr. Rajkumar P |
| 3 | VI | VAC-S6 Foundations of Data Science | Mr. Vysak Valsan |
| 4 | VIII | VAC-S8 VLSI using Virtual Lab | Ms. Lisa C |

2. The course will be conducted during the allotted hours for ADD-ON course in the timetable. Students must register before 26.01.2024.
3. Staff Advisors of respective classes should ensure maximum participation and monitor the attendance.

The meeting came to an end at 10:30 AM





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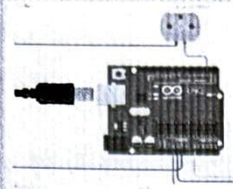


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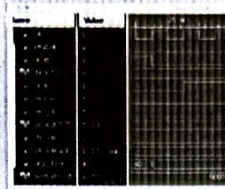
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Department of Electronics & Communication Engineering AY 2023-2024 | Odd Semester | B.Tech Add On Course Registration



Course: VAC-S1 Arduino
using TINKER CAD
Semester: I



Course: VAC-S3 Familiarization of
VHDL / Verilog
Semester: III

Scan to Register



Last Date: 15.09.2023

Classes Starts from
18.09.2023. Contact
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Information



Course: VAC-S5 IoT
Semester: V



Course: VAC-S7 Raspberry Pi
Semester: VII

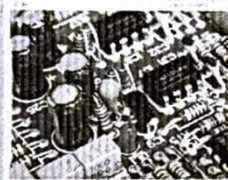


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Department of Electronics & Communication Engineering AY 2023-2024 | Even Semester | B.Tech Add On Course Registration



Course: VAC-S2 Foundations
of Python
Semester: II



Course: VAC-S4 Logic Design
using Virtual Lab
Semester: VI

Scan to Register



Last Date: 26.01.2024

Classes Starts from
29.01.2024. Contact
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Course: VAC-S6 Foundations
of Data Science
Semester: VI



Course: VAC-S8 VLSI Lab
through VL
Semester: VIII



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From,

Vysak Valsan
Asst. Professor, Dept. of ECE
NCERC

To,

The Principal
NCERC

Sairam

Through: Head of the Department, ECE, NCERC

Subject: Request to Conduct ADD ON Course VAC-S6 Foundations of Data Science for B. Tech ECE VI Semester Students (AY 2023-24)

Respected Sir,

The Department of Electronics and Communication Engineering is planning to conduct 30 hours ADD ON VAC-S6 course on "Foundations of Data Science", for the VI Semester, B. Tech ECE students during the academic year 2023-2024. The course is intended to be beneficial for students in their academics and for their career.

I request you to kindly grant permission for the same.

Thanks,

Vysak Valsan

Vysak Valsan
Asst. Professor,
Dept. of ECE, NCERC

Forwarded to Principal

cmf

HOD, ECE

Pampady
15.01.2024

Principals

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

ADMISSION NOTIFICATION FOR ADD ON COURSE FOR B. TECH ECE

AY 2023-24 | EVEN SEMESTER

16.01.2024

Applications are invited for admission from VI Semester B. Tech ECE students for the **Add-On Course VAC-S6 Foundations of Data Science** offered by the Department of Electronics & Communication Engineering, Nehru College of Engineering and Research Centre (Autonomous).

Last Date for Registration: 26.01.2024

Scan to Register:



Examination Eligibility - Attendance:

A minimum of 75% attendance is required for writing the examination.

Important Dates:

Commencement of Classes: 29.01.2024

Examination Date: 06.05.2024

Ceylan

COURSE COORDINATOR

my

HOD, ECE



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ADD ON COURSE

VI Semester B. Tech ECE (2021-25 Batch)

ADD ON: VAC-S6 Foundations of Data Science

Course Outcomes: After the completion of the course the student will be able to

| | |
|------|--|
| CO 1 | Understand the basics of machine learning and different types. |
| CO 2 | Differentiate regression and classification, and non-metric methods |
| CO 3 | Apply statistical methods in non-linear classification and neural networks |
| CO 4 | Understand the basics of unsupervised learning and ensemble methods |
| CO 5 | Understand the basics of deep learning networks, convolutional neural networks |

Module 1 (6 Hours)

Basics of machine learning, supervised and unsupervised learning, examples, features, feature vector, training set, target vector, test set, over-fitting, curse of dimensionality. Evaluation and model selection: ROC curves, evaluation measures, validation set, bias-variance trade-off, confusion matrix, recall, precision, accuracy.

Module 2 (6 Hours)

Regression: linear regression, error functions in regression, multivariate regression, regression applications, bias and variance, Classification: Bayes' decision theory, discriminant functions and decision surfaces, Bayesian classification for normal distributions, classification applications.

Module 3 (6 Hours)

Linear discriminant based algorithm: perceptron, perceptron algorithm, support vector machines. Nonlinear classifiers, the XOR problem, multilayer perceptron, backpropagation algorithm.

Module 4 (6 Hours)

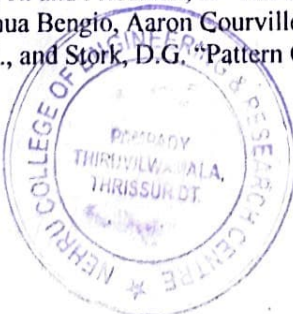
Unsupervised learning: Clustering, examples, criterion functions for clustering, proximity measures, algorithms for clustering. Ensemble methods: boosting, bagging. Basics of decision trees, random forest, examples.

Module 5 (6 Hours)

Introduction to deep learning networks, deep feedforward networks, basics of convolutional neural networks (CNN) CNN basic structure, Hyper-parameter tuning, Regularization - Dropouts, Initialization, CNN examples

Reference Books

1. Bishop, C. M. "Pattern Recognition and Machine Learning" Springer, New York, 2006.
2. Theodoridis, S. and Koutroumbas, K. "Pattern Recognition". Academic Press, San Diego, 2003.
3. Hastie, T., Tibshirani, R. and Friedman, J. "The Elements of Statistical Learning". Springer.
4. Ian Goodfellow, Yoshua Bengio, Aaron Courville. "Deep Learning" MIT Press, 2016.
5. Duda, R.O., Hart, P.E., and Stork, D.G. "Pattern Classification". Wiley, New York,



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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

AV 2023-24 | EVEN SEMESTER
ADD-ON COURSE - VAC SO FOUNDATIONS OF DATA SCIENCE | ATTENDANCE SHEET | 24.04.2024

| Sl. No. | Reg. No. | Name | 31.01.24 | 03.02.24 | 05.02.24 | 07.02.24 | 09.02.24 | 11.02.24 | 14.02.24 | 14.02.24 | 14.02.24 | 28.02.24 |
|---------|----------|------|----------|
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| Sl. No. | Reg. No. | Name | 23.03.24 | 23.03.24 | 30.03.24 | 30.03.24 | 30.03.24 | 30.03.24 | 30.03.24 | 30.03.24 | 30.03.24 | 03.04.24 | 03.04.24 | 17.04.24 | 24.04.24 | 24.04.24 | Total
Hours
Present | % |
|---------|-----------|----------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|---------------------------|----|
| 1 | NCE1EC001 | AKSHARA P S | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 28 | 93 |
| 2 | NCE1EC002 | ALEESHA FATHIMA K A | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 29 | 97 |
| 3 | NCE1EC004 | ANOGIAN V | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 28 | 93 |
| 4 | NCE1EC005 | ARVAK R | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 29 | 97 |
| 5 | NCE1EC006 | ASHWIN NAIR | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 29 | 97 |
| 6 | NCE1EC008 | ASWIN V | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 29 | 97 |
| 7 | NCE1EC009 | ATHIRA P B | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 29 | 97 |
| 8 | NCE1EC010 | ATHULYA G M | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 28 | 93 |
| 9 | NCE1EC011 | AVISHA FATHIMA H | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 28 | 93 |
| 10 | NCE1EC012 | DHIVA J | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 29 | 97 |
| 11 | NCE1EC013 | DIVA T R | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 28 | 93 |
| 12 | NCE1EC014 | DWJESHT D | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 28 | 93 |
| 13 | NCE1EC015 | FATHIMATHUL SMILA CA | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 29 | 97 |
| 14 | NCE1EC016 | GOKUL A P | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 29 | 97 |
| 15 | NCE1EC017 | ISMAIL P S | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 28 | 93 |
| 16 | NCE1EC018 | JITHIN M S | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 29 | 97 |
| 17 | NCE1EC019 | KAVYA P | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 26 | 87 |
| 18 | NCE1EC020 | NEERANAPRAHAS S | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 29 | 97 |

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Course Coordinator



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[Signature]

HOD, ECE



S6 Add-On Course Foundations of Data Science

Test Paper (B.Tech ECE 2021-25)

AY: 2023-24 | Test Date: 06.05.2024

Section A: Basics of Machine Learning

1. What is the primary difference between supervised and unsupervised learning?

- a) Supervised learning uses labeled data, while unsupervised learning uses unlabeled data.
- b) Supervised learning is faster than unsupervised learning.
- c) Unsupervised learning works only on large datasets.
- d) Supervised learning uses data with missing values.

2. In supervised learning, what is the "target vector"?

- a) A collection of input data points.
- b) A set of features used for prediction.
- c) The vector containing the correct output values corresponding to each input in the training set.
- d) The vector of predicted output values.

3. Which of the following is an example of unsupervised learning?

- a) Linear regression
- b) Decision tree classification
- c) K-means clustering
- d) Support vector machines

Section B: Model Evaluation and Objectives

4. Which of the following measures helps to evaluate the trade-off between sensitivity (recall) and specificity in a binary classification model?

- a) Accuracy
- b) Confusion matrix
- c) ROC curve
- d) F1 score

5. What is a feature vector in machine learning?

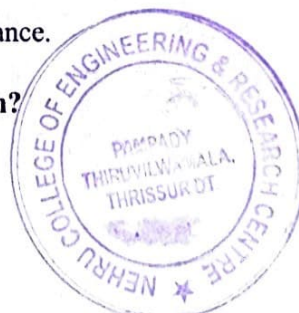
- a) A vector of weights learned by the model.
- b) A vector containing the true labels of the training set.
- c) A vector containing input data points, representing the values of features for a particular instance.
- d) The set of evaluation metrics for model performance.

6. What is the main objective of linear regression?

- a) To minimize the correlation between variables.

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- b) To find a relationship between a dependent variable and one or more independent variables.
- c) To classify data into different categories.
- d) To calculate the distance between data points.

Section C: Regression and Model Performance

7. What is the purpose of the error (loss) function in regression?

- a) To optimize the classification accuracy.
- b) To measure the difference between predicted and actual values.
- c) To normalize the input data.
- d) To calculate the gradient in linear regression.

8. In multivariate regression, the dependent variable is:

- a) A single scalar value.
- b) A vector with multiple values.
- c) Always binary.
- d) None of the above.

9. Which of the following is an example of an application of regression?

- a) Image classification
- b) Predicting house prices
- c) Grouping similar objects together
- d) Recommending movies to users

Section D: Bias, Variance, and Bayes' Theorem

10. Bias in a machine learning model typically leads to:

- a) Overfitting the training data
- b) Underfitting the training data
- c) A perfectly fitted model
- d) Random fluctuations in the predictions

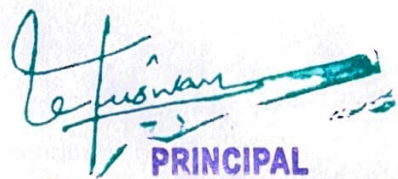
11. Bayes' decision theory is used in classification to:

- a) Minimize the regression error
- b) Find the boundary between two classes
- c) Maximize the likelihood of a given observation
- d) Measure the bias of a model

12. In Bayesian classification for normal distributions, the discriminant function:

- a) Determines the decision boundary between classes
- b) Measures the bias in the classifier
- c) Predicts the regression coefficient
- d) Identifies the highest variance in the data

Section E: Support Vector Machines and Perceptrons



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13. What is the primary purpose of the perceptron algorithm?

- a) To minimize the error in regression tasks
- b) To classify linearly separable data
- c) To maximize the margin between classes
- d) To perform dimensionality reduction

14. In the context of support vector machines (SVM), the term "margin" refers to:

- a) The distance between the support vectors and the hyperplane
- b) The maximum error allowed in predictions
- c) The dimensionality of the feature space
- d) The total number of support vectors used in classification

15. The XOR problem is often cited as a challenge for:

- a) Linear classifiers
- b) Logistic regression
- c) Support vector machines
- d) Decision trees

Section F: Deep Learning and Neural Networks

16. Which of the following best describes a multilayer perceptron (MLP)?

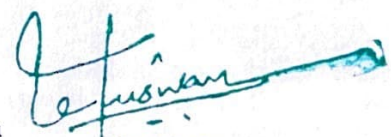
- a) A single-layer network that can only solve linearly separable problems
- b) A network that uses multiple perceptrons in a single layer
- c) A type of neural network with one or more hidden layers
- d) A network that does not use activation functions

17. What is the primary function of the backpropagation algorithm?

- a) To initialize weights in a neural network
- b) To propagate the error backward through the network and update weights
- c) To compute the activation functions for neurons
- d) To classify the input data into categories

18. In a nonlinear classifier, the goal is to:

- a) Create a linear boundary between classes
- b) Map input features into a higher-dimensional space for separation
- c) Use only one layer of neurons
- d) Limit the number of support vectors


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Section G: Clustering and Dimensionality Reduction

19. What is the primary objective of clustering in unsupervised learning?

- a) To predict a target variable
- b) To group similar data points together based on features
- c) To reduce the dimensionality of the data
- d) To find the best decision boundary between classes

20. Which of the following is a commonly used proximity measure for clustering?

- a) Mean squared error





- b) Euclidean distance
- c) Cross-entropy
- d) R-squared

21. In clustering, the criterion function often used to evaluate the quality of clusters is:

- a) Sum of squared distances within clusters
- b) Total prediction error
- c) The F1 score
- d) Confusion matrix

Section H: Advanced Topics in Machine Learning

22. Boosting is an ensemble method that:

- a) Combines weak classifiers into a strong classifier by focusing on errors of previous classifiers
- b) Averages predictions from multiple classifiers to reduce variance
- c) Relies solely on a single model for predictions
- d) Uses bagging techniques to create bootstrapped datasets

23. Random forests improve upon decision trees by:

- a) Using only a single decision tree to make predictions
- b) Combining predictions from multiple decision trees to reduce overfitting
- c) Limiting the depth of each tree to a maximum of two levels
- d) Using a linear regression model instead of decision trees

24. What is the primary function of deep feedforward networks in deep learning?

- a) To classify input data based on proximity measures
- b) To map input features to output through multiple layers of neurons
- c) To perform clustering on large datasets
- d) To reduce the dimensionality of the input data

Section I: Applications and Regularization

25. In a Convolutional Neural Network (CNN), what is the main role of the convolutional layer?

- a) To reduce the number of parameters using max pooling
- b) To detect features such as edges and textures in the input image
- c) To perform classification based on the input features
- d) To normalize the data before feeding it into the network

26. Which of the following is a hyper-parameter in deep learning networks that requires tuning?

- a) Number of epochs
- b) Training data size
- c) Mean squared error
- d) Output layer size


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27. What is the primary purpose of using dropouts as a regularization technique in deep learning?

- a) To enhance the learning rate
- b) To prevent overfitting by randomly dropping neurons during training
- c) To decrease the complexity of the neural network
- d) To ensure all neurons are trained equally

28. What happens during weight initialization in deep learning networks?

- a) Initial weights are set to random values before training starts
- b) Weights are updated using backpropagation
- c) Weights are initialized to zero for faster convergence
- d) Initial weights are set to the mean of the dataset

29. Which of the following is a common example of CNN application?

- a) Recommender systems
- b) Image recognition tasks, such as object detection
- c) Time series prediction
- d) Clustering of unlabeled data

30. In clustering, what is the role of dimensionality reduction techniques like PCA?

- a) To enhance clustering accuracy
- b) To reduce computational complexity
- c) To visualize data in fewer dimensions
- d) All of the above

Answer Key:-

| Q.No | Answer | Q.No | Answer | Q.No | Answer |
|------|--------|------|--------|------|--------|
| 1 | a | 11 | b | 21 | a |
| 2 | c | 12 | a | 22 | a |
| 3 | c | 13 | b | 23 | b |
| 4 | c | 14 | a | 24 | b |
| 5 | c | 15 | a | 25 | b |
| 6 | b | 16 | c | 26 | a |
| 7 | b | 17 | b | 27 | b |
| 8 | b | 18 | b | 28 | a |
| 9 | b | 19 | b | 29 | b |
| 10 | b | 20 | b | 30 | d |



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S6 Add - On Course Foundations of Data Science - Test Paper (B. Tech ECE 2021-25)

AY: 2023-24

Test Date: 06.05.2024

The respondent's email (athulyagm30@gmail.com) was recorded on submission of this form.

Name of the Student *

Athulya GM

Register No. *

NCE21EC010

Mail ID *

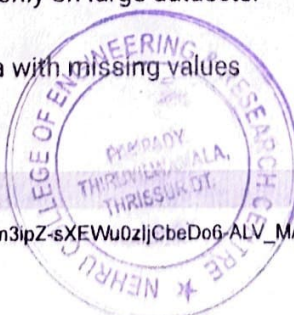
athulyagm30@gmail.com

MCQ - Questions

What is the primary difference between supervised and unsupervised learning?

1 point

- ☒ a) Supervised learning uses labeled data, while unsupervised learning uses unlabeled data.
- ☐ b) Supervised learning is faster than unsupervised learning.
- ☐ c) Unsupervised learning works only on large datasets.
- ☐ d) Supervised learning uses data with missing values



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In supervised learning, what is the "target vector"?

1 point

- ☐ a) A collection of input data points.
- ☐ b) A set of features used for prediction.
- ☒ c) The vector containing the correct output values corresponding to each input in the training set.
- ☐ d) The vector of predicted output values.

Which of the following is an example of unsupervised learning?

1 point

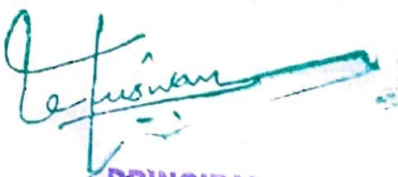
- ☐ a) Linear regression
- ☐ b) Decision tree classification
- ☒ c) K-means clustering
- ☐ d) Support vector machines

Which of the following measures helps to evaluate the trade-off between sensitivity (recall) and specificity in a binary classification model?

1 point

- ☐ a) Accuracy
- ☐ b) Confusion matrix
- ☒ c) ROC curve
- ☐ d) F1 score




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What is a feature vector in machine learning?

1 point

- ☐ a) A vector of weights learned by the model.
- ☐ b) A vector containing the true labels of the training set.
- ☒ c) A vector containing input data points, representing the values of features for a particular instance.
- ☐ d) The set of evaluation metrics for model performance.

Which of the following is the main objective of linear regression?

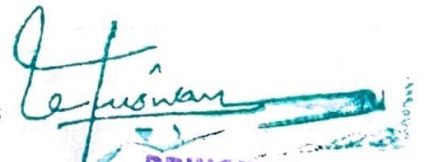
1 point

- ☐ a) To minimize the correlation between variables
- ☒ b) To find a relationship between a dependent variable and one or more independent variables
- ☐ c) To classify data into different categories
- ☐ d) To calculate the distance between data points

What is the purpose of the error (loss) function in regression?

1 point

- ☐ a) To optimize the classification accuracy
- ☒ b) To measure the difference between predicted and actual values
- ☐ c) To normalize the input data
- ☐ d) To calculate the gradient in linear regression


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In multivariate regression, the dependent variable is:

1 point

- ☐ a) A single scalar value
- ☒ b) A vector with multiple values
- ☐ c) Always binary
- ☐ d) None of the above

Which of the following is an example of an application of regression?

1 point

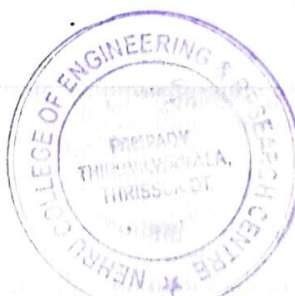
- ☐ a) Image classification
- ☒ b) Predicting house prices
- ☐ c) Grouping similar objects together
- ☐ d) Recommending movies to users

Bias in a machine learning model typically leads to:

1 point

- ☐ a) Overfitting the training data
- ☒ b) Underfitting the training data
- ☐ c) A perfectly fitted model
- ☐ d) Random fluctuations in the predictions


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Bayes' decision theory is used in classification to:

1 point

- ☐ a) Minimize the regression error
- ☐ b) Find the boundary between two classes
- ☒ c) Maximize the likelihood of a given observation
- ☐ d) Measure the bias of a model

In Bayesian classification for normal distributions, the discriminant function:

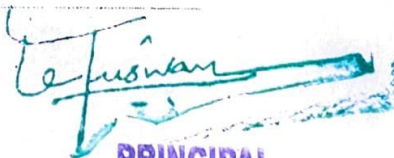
1 point

- ☒ a) Determines the decision boundary between classes
- ☐ b) Measures the bias in the classifier
- ☐ c) Predicts the regression coefficient
- ☐ d) Identifies the highest variance in the data

What is the primary purpose of the perceptron algorithm?

1 point

- ☐ a) To minimize the error in regression tasks
- ☒ b) To classify linearly separable data
- ☐ c) To maximize the margin between classes
- ☐ d) To perform dimensionality reduction


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In the context of support vector machines (SVM), the term "margin" refers to:

1 point

- ☒ a) The distance between the support vectors and the hyperplane
- ☐ b) The maximum error allowed in predictions
- ☐ c) The dimensionality of the feature space
- ☐ d) The total number of support vectors used in classification

The XOR problem is often cited as a challenge for:

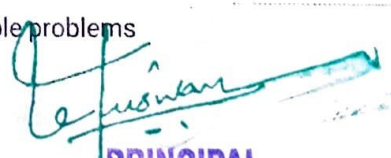
1 point

- ☒ a) Linear classifiers
- ☐ b) Logistic regression
- ☐ c) Support vector machines
- ☐ d) Decision trees

Which of the following best describes a multilayer perceptron (MLP)?

1 point

- ☐ a) A single-layer network that can only solve linearly separable problems
- ☐ b) A network that uses multiple perceptrons in a single layer
- ☒ c) A type of neural network with one or more hidden layers
- ☐ d) A network that does not use activation functions


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What is the primary function of the backpropagation algorithm?

1 point

- ☐ a) To initialize weights in a neural network
- ☒ b) To propagate the error backward through the network and update weights
- ☐ c) To compute the activation functions for neurons
- ☐ d) To classify the input data into categories

In a nonlinear classifier, the goal is to:

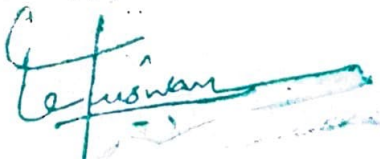
1 point

- ☐ a) Create a linear boundary between classes
- ☒ b) Map input features into a higher-dimensional space for separation
- ☐ c) Use only one layer of neurons
- ☐ d) Limit the number of support vectors

What is the primary objective of clustering in unsupervised learning?

1 point

- ☐ a) To predict a target variable
- ☒ b) To group similar data points together based on features
- ☐ c) To reduce the dimensionality of the data
- ☐ d) To find the best decision boundary between classes


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Which of the following is a commonly used proximity measure for clustering?

1 point

- ☐ a) Mean squared error
- ☒ b) Euclidean distance
- ☐ c) Cross-entropy
- ☐ d) R-squared

In clustering, the criterion function often used to evaluate the quality of clusters is:

1 point

- ☒ a) Sum of squared distances within clusters
- ☐ b) Total prediction error
- ☐ c) The F1 score
- ☐ d) Confusion matrix



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1 point

Boosting is an ensemble method that:

- ☒ a) Combines weak classifiers into a strong classifier by focusing on errors of previous classifiers
- ☐ b) Averages predictions from multiple classifiers to reduce variance
- ☐ c) Relies solely on a single model for predictions
- ☐ d) Uses bagging techniques to create bootstrapped datasets



Which of the following statements is true regarding decision trees?

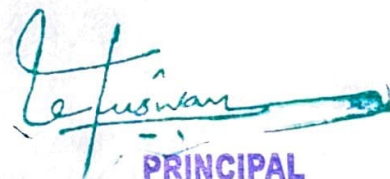
1 point

- ☒ a) They are sensitive to noisy data and can easily overfit.
- ☐ b) Decision trees are always linear classifiers.
- ☐ c) They cannot handle categorical data.
- ☐ d) They require extensive parameter tuning to perform well.

Random forests improve upon decision trees by:

1 point

- ☐ a) Using only a single decision tree to make predictions
- ☒ b) Combining predictions from multiple decision trees to reduce overfitting
- ☐ c) Limiting the depth of each tree to a maximum of two levels
- ☐ d) Using a linear regression model instead of decision trees


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What is the primary function of deep feedforward networks in deep learning?

- ☐ a) To classify input data based on proximity measures
- ☒ b) To map input features to output through multiple layers of neurons
- ☐ c) To perform clustering on large datasets
- ☐ d) To reduce the dimensionality of the input data

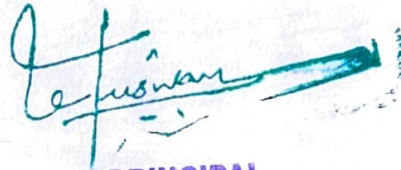


In a Convolutional Neural Network (CNN), what is the main role of the convolutional layer? 1 point

- ☐ a) To reduce the number of parameters using max pooling
- ☒ b) To detect features such as edges and textures in the input image
- ☐ c) To perform classification based on the input features
- ☐ d) To normalize the data before feeding it into the network

Which of the following is a hyper-parameter in deep learning networks that requires tuning? 1 point

- ☒ a) Number of epochs
- ☐ b) Training data size
- ☐ c) Mean squared error
- ☐ d) Output layer size


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What is the primary purpose of using dropouts as a regularization technique in deep learning? 1 point

- ☐ a) To enhance the learning rate
- ☒ b) To prevent overfitting by randomly dropping neurons during training
- ☐ c) To decrease the complexity of the neural network
- ☐ d) To ensure all neurons are trained equally



What happens during weight initialization in deep learning networks?

1 point

- ☒ a) Initial weights are set to random values before training starts
- ☐ b) Weights are updated using backpropagation
- ☐ c) Weights are initialized to zero for faster convergence
- ☐ d) Initial weights are set to the mean of the dataset

Which of the following is a common example of CNN application?

1 point

- ☐ a) Recommender systems
- ☒ b) Image recognition tasks, such as object detection
- ☐ c) Time series prediction
- ☐ d) Clustering of unlabeled data

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Google Forms

| Q. No | Answer Marked | Marks Obtained | Q. No | Answer Marked | Marks Obtained | Q. No | Answer Marked | Marks Obtained |
|-------|---------------|----------------|-------|---------------|----------------|-------|---------------|----------------|
| 1 | a | 1 | 11 | b | 0 | 21 | a | 1 |
| 2 | c | 1 | 12 | a | 1 | 22 | a | 1 |
| 3 | c | 1 | 13 | b | 1 | 23 | b | 1 |
| 4 | c | 1 | 14 | a | 1 | 24 | b | 1 |
| 5 | c | 1 | 15 | a | 1 | 25 | b | 1 |
| 6 | b | 1 | 16 | c | 1 | 26 | b | 0 |
| 7 | b | 1 | 17 | b | 1 | 27 | a | 0 |
| 8 | b | 1 | 18 | b | 1 | 28 | b | 0 |
| 9 | b | 1 | 19 | b | 1 | 29 | a | 0 |
| 10 | b | 1 | 20 | b | 1 | 30 | b | 0 |

Marks: 24/30

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**DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING****AY 2023-24 | EVEN SEMESTER****ADD-ON COURSE – VAC S6 FOUNDATIONS OF DATA SCIENCE****MARKS SHEET – 05.05.2024**

| Sl. No. | Reg. No. | Name | Marks Scored |
|---------|------------|-----------------------|--------------|
| | | | 30 |
| 1 | NCE21EC001 | AKSHARA P S | 22 |
| 2 | NCE21EC002 | ALEESHA FATHIMA K A | 21 |
| 3 | NCE21EC004 | ANOOJA N V | 22 |
| 4 | NCE21EC005 | ARYA K R | 23 |
| 5 | NCE21EC006 | ASHWIN NAIR | 24 |
| 6 | NCE21EC008 | ASWIN V | 22 |
| 7 | NCE21EC009 | ATHIRA P B | 22 |
| 8 | NCE21EC010 | ATHULYA G M | 24 |
| 9 | NCE21EC011 | AYISHA FATHIMA H | 22 |
| 10 | NCE21EC012 | DHIYA J | 20 |
| 11 | NCE21EC013 | DIYA T R | 20 |
| 12 | NCE21EC014 | DWIJESH T D | 21 |
| 13 | NCE21EC015 | FATHIMATHUL SAHLA C A | 22 |
| 14 | NCE21EC016 | GOKUL A P | 23 |
| 15 | NCE21EC017 | ISMAIL P S | 24 |
| 16 | NCE21EC018 | JITHIN M S | 25 |
| 17 | NCE21EC019 | KAVYA P | 25 |
| 18 | NCE21EC020 | KRISHNAPRABHA S | 25 |
| 19 | NCE21EC021 | LAVANYA M | 24 |
| 20 | NCE21EC022 | M ADHITH KRISHNA | 24 |
| 21 | NCE21EC023 | MALAVIKA S MADHAVAN | 24 |
| 22 | NCE21EC024 | MIDHUN K | 22 |
| 23 | NCE21EC025 | MUHAMMED SABITH K M | 21 |
| 25 | NCE21EC027 | NAKUL DEV K | 23 |
| 26 | NCE21EC028 | NANDANA PRAKASH J | 24 |
| 27 | NCE21EC030 | PRAVEEN K P | 25 |

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

AY 2023-24 | EVEN SEMESTER

ADD-ON COURSE – VAC S6 FOUNDATIONS OF DATA SCIENCE

MARKS SHEET – 05.05.2024

| Sl. No. | Reg. No. | Name | Marks Scored |
|---------|------------|-----------------|--------------|
| | | | 30 |
| 28 | NCE21EC031 | RAHUL K R | 24 |
| 29 | NCE21EC033 | RITHESSAW R | 24 |
| 30 | NCE21EC034 | SIYA Y | 22 |
| 31 | NCE21EC035 | SREEHARI T A | 21 |
| 32 | NCE21EC036 | SREEVINAYAK P S | 21 |
| 33 | NCE21EC037 | SURESH S | 20 |
| 34 | NCE21EC038 | THRISHA S | 19 |
| 35 | NCE21EC039 | VINAY MURALI | 20 |

Ceylan
ce

COURSE COORDINATOR

mf

HOD, ECE

Principals

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CERTIFICATE

OF COMPLETION

PROUDLY PRESENTED TO

Ms. ATHULYA G M

(NCE21EC010)

for successfully completing the add-on course on "VAC-S6 Foundations of **Data Science**" conducted by Department of Electronics and Communication Engineering, Nehru College of Engineering and Research Centre (Autonomous), in the Even Semester of Academic Year 2023-2024.



Valsan

Mr. Vysak Valsan
Course Coordinator



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Mredhula L

Dr. Mredhula L
HOD, ECE

10.05.2024

NEHRU COLLEGE OF ENGINEERING AND RESEARCH CENTRE

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PAMPADY, THIRUVILWAMALA, THRISSUR DIST.

MINUTES OF DEPARTMENT ADVISORY COMMITTEE MEETING HELD ON 18/01/2024

A meeting of the Department Advisory Committee (DAC) was held on 18th January 2024 at 3:00 PM in the chamber of HoD, EEE department.

The following members were present:

1. Dr. Sobha Manakkal, HoD, Dept. of EEE. 
2. Mr. Sundaramoorthi P. Associate Professor, Dept. of EEE. 
3. Mr. Rajesh P-Assistant Professor, Dept. of EEE. 
4. Mr. David E-Assistant Professor, Dept. of EEE. 
5. Mr. Anoop Kumar M.V-Assistant Professor, Dept. of EEE. 

The following decisions were taken:

1. It was decided to conduct a certificate course on "ROBUST CONTROL SYSTEMS" from 23rd January 2024 to 20th April 2024 for a period of 30 hours.
2. The course will enhance the technical knowledge of students related the latest developments in the field of Robotics and its design.
3. It was decided to provide the course for 2020-24 batch UG students.
4. Also, it was decided to ensure compulsory attendance and staff advisors should monitor the same.

The meeting came to an end at 3:30 PM.


HoD


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FROM,

ANOOP KUMAR M.V,

ASSISTANT PROFESSOR,

EEE DEPARTMENT,

NCERC,

PAMPADY

TO,

THE PRINCIPAL,(THROUGH HOD)

EEE DEPARTMENT,

NCERC,

PAMPADY

Sir,

SUB: Requisition for conducting a value added course on" ROBUST CONTROL SYSTEMS "-Reg.

As the assistant professor of EEE department I would like to request your support and permission to conduct a certificate course on "ROBUST CONTROL SYSTEMS "from January 2024 to April 2024.The duration of the course will be for a period of 30 hours. The objective of the course is to impart in depth understanding of robust control systems used to design and manufacture robots which will be useful for student projects and for their further career. This course will act as a key to enhance knowledge level of students.

The 2020-24 batch students of EEE department are eligible for this course.

So, I request you to provide permission for doing this value added course.

Thank you for your consideration. I look forward for your response soon.

PLACE: Pampady
DATE: 18/01/2024


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Thiruvilwamala, Thrissur - 680508

Your's sincerely,

ANOOP KUMAR M.V

NEHRU COLLEGE OF ENGINEERING & RESEARCH CENTRE
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Pampady, Thiruvilwamala, Thrissur Dt.

ELECTRICAL AND ELECTRONICS DEPARTMENT

NOTICE

18.01.2024

Department has decided to conduct a certificate course on "ROBUST CONTROL SYSTEMS" from January 23rd, 2024 to April 20th, 2024. The duration of the course will be for a period of 30 hours. The objective of the course is to impart knowledge on latest developments in the field of robotics and its design. This course will act as a key for enhancing know how of students on new trends in robotics and to foster their career opportunities in that field.

Students of 2020-24 batch admissions (UG) are eligible for this course. All concerned students should attend the entire course without fail. Attendance is compulsory.

Copy:

1. Department Notice Board
2. Staff advisors (For Information to students)
3. Office file


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HoD



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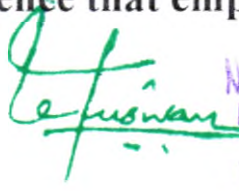
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NCERC, an autonomous institution with NAAC and NBA Accreditation has always been in the forefront of providing quality education, catering to the needs of society and has been ever-evolving. **Nehru College of Engineering & Research Centre (NCERC)**, an esteemed autonomous college in Kerala, situated on the serene banks of the river Nila. Established in 2002, NCERC is a premier institution affiliated with Kerala State APJ Abdul Kalam Technological University and has been conferred with autonomous status by UGC for the academic year 2023-2024. At NCERC, we are committed to providing a top-notch academic curriculum and adopting excellent teaching pedagogy and innovative evaluation methods. As an NBA accredited engineering college in Palakkad, we take pride in offering a range of undergraduate and postgraduate programs in Engineering, Management, and IT. At NCERC, we are guided by a set of core values that define our institution and set us apart as a premier educational institution.

We prioritize academic excellence and strive to provide a rigorous and comprehensive curriculum that equips students with the knowledge and skills needed to succeed in their chosen fields. Our faculty members are highly qualified and experienced, dedicated to providing quality education and mentorship to our students. Our state-of-the-art laboratories and research facilities provide students with the resources they need to explore new ideas and push the boundaries of knowledge. NCERC has strong ties with industry partners, which allows us to offer students opportunities for internships, industrial visits, and placements in leading companies. Overall, NCERC is committed to providing a transformative educational experience that empowers


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students to reach their full potential, excel in their careers, and make a positive impact on society.

ELECTRICAL AND ELECTRONICS ENGINEERING

Department of Electrical and Electronics, NCERC, since its inception in 2004, has always believed that knowledge sharing is the way to bring change and it is necessary to remain technically updated about what new is happening all over the globe and how we can use it for making life easier and better. The Department of Electrical & Electronics

Engineering is committed to a tradition of excellence in teaching, Research and Consultancy service. With well qualified, devoted and dedicated team of teaching and non-teaching members of staff. The Department always strives for imparting Quality Technical Education for the Under Graduate & Post Graduate Program (M. Tech in Energy Systems) so as to enable the students competent enough to meet the challenges of globalization with the state-of-the art equipment's and laboratories and good interaction with industries.

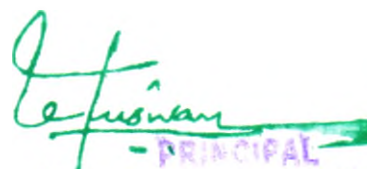
MAIN OBJECTIVE

The primary objective of this add-on course is to provide knowledge on control problems designing linear models, loop shaping etc. It aims to define robust stability and performances ,trade-offs in MIMO feedback design etc.

Major Topics Covered:

- ✓ Introduction
- ✓ Key Concepts
- ✓ Robust Control Definition
- ✓ Effects of Uncertainty
- ✓ Modeling
- ✓ Available tools, techniques, and metrics
- ✓ Relationship to other topics
- ✓ Conclusions
- ✓ Annotated Reference List
- ✓ Loose Ends




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WHO SHOULD ATTEND?

All final year students of B.Tech 2020-24 Electrical and Electronics Engineering Branch.

RESOURCE PERSON

- Mr. Anoop Kumar Assistant Professor,
M.V Department of
 Electrical and
 Electronics
 Engg.,NCERC



A handwritten signature in green ink, appearing to read "Le fusion", is written over a horizontal line.

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ROBUST CONTROL SYSTEMS

23rd January 2024 - 24th April 2024

REGISTRATION FORM

Name :

Register Number :

Department :

Semester :

Email-ID :

Mobile Number :

Declaration:

The information provided is true to the best of my knowledge. I agree to abide by the rules and regulations of the course and shall attend the course for the entire duration.

Place:

Date:

Name & Signature of
Applicant




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D ELECTRONICS ENGINEERING

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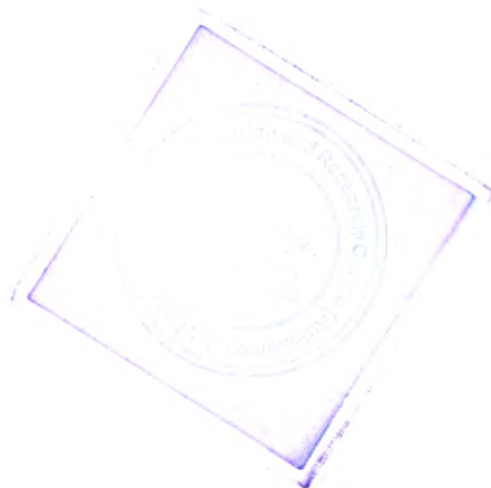
List

LD ATTEND?

Tech 2020-24 Electrical and
nch.

E PERSON

✓ Assistant Professor,
Department of Electrical
and Electronics
Engg..NCERC



[Signature]
PRINCIPAL
Nehru College of Engineering and
Research Centre (Autonomous)
Nila Gardens, Pampady
Thiruvilwamala, Thrissur - 686689

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DEPARTMENT OF: ELECTRICAL & ELECTRONICS ENGINEERING

Name of the Faculty: ANOOP KUNHA M.V.

Branch / Course: EEE / B.TECH

Year & Semester: IV & VIII

Subject Code: VACE

Name of the Subject: ROBUST CONTROL SYSTEMS

Objective of the Course: *

To understand Control Principles,
designing linear models, loop shaping etc.* To understand Multi variable Transfer
function for MIMO, introduction to
robustness.* To define robust stability & performance,
trade-offs in MIMO feedback design etc.

RECORD CHECKING

| Month | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May |
|-------------------------|-----|-----|-----|-----|-----|-----|-----|----------------|----------|----------|----------|-----|
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HOD | | | | | | | | 18m
11/2/24 | 11/03/24 | 02/04/24 | 15/04/24 | |
| Initial of
Principal | | | | | | | | 13/ | 13/ | 13/ | 13/ | |

Final Verification By

Principal

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Research Centre (Autonomous)
Nile Gardens, Pampady
Thiruvilwamala, Thrissur - 688000

| TIME TABLE | | | | | | | |
|----------------|---|------------------|---|---|---|------------------|---|
| DAYS / PERIODS | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Monday | | | | | | | |
| Tuesday | | | | | | VAC ₈ | |
| Wednesday | | | | | | | |
| Thursday | | VAC ₈ | | | | | |
| Friday | | | | | | | |
| Saturday | | | | | | | |

Total No. of Periods / Week :

| WORK LOAD | | | | |
|--------------------------------|------------------------------|-----------------|--------------|---------|
| Subject Code | Theory / Practical / Project | Sem | Periods/Week | Remarks |
| EED 416 | PROJECT | 8 th | 14 | |
| EET 404 | THEORY | 8 th | 1 | |
| VAC ₈ | THEORY | 8 th | 2 | |
| ACW 202 | THEORY | 4 th | 2 | |
| EET 302 | THEORY | 6 th | 5 | |
| | | | | |
| | | | | |
| TOTAL
Periods / Week | | | | |
| Administrative Work, if any :- | | | | |



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Nile Gardens, Pampady
Thiruvananthapuram - 800509

DEPARTMENT VISION

To excel in technical education and research in the field of Electrical & Electronics Engg. by imparting innovative Engineering theories, concepts and practical to improve the Production and utilization of Power and Energy for the betterment of the nation.

DEPARTMENT MISSION

- ★ To offer quality education in Electrical & Electronics Engg. and prepare the students for Professional Career and higher studies.
- ★ To create research collaboration with Industries for gaining knowledge about real time problems.
- ★ To Prepare students with sound technical knowledge.
- ★ To make students socially responsible.



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Thiruvananthapuram, Kerala - 680588

SYLLABUS



NEHRU COLLEGE OF ENGINEERING AND RESEARCH CENTRE
(NAAC "A" Accredited)

(Approved by AICTE, Affiliated to APJ Abdul Kalam Technological University, Kerala)



DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

VAC: ROBUST CONTROL SYSTEMS

SYLLABUS

MODULE-I: Review of classical feedback control Review of classical feedback control: The control problem, Transfer functions, Deriving linear models, Frequency response, Feedback control, Closed loop stability, Evaluating closed - loop performance, Controller design, Loop shaping, Shaping closed loop transfer functions.

MODULE-II: Introduction to Multivariable Control Transfer functions for MIMO systems, Multivariable frequency response analysis, Control of multivariable plants, Introduction to robustness, General control problem formulation. Elements of Linear System Theory: Internal stability of feedback systems, Stabilizing controllers, System norms, Input - Output Controllability, perfect control and plant inversion, Constraints on S and T.

MODULE-III: General control formulation with uncertainty, Representing uncertainty, Obtaining P, N and M, Definition of robust stability and performance, Robust stability of the $M\Delta$ - structure, RS for complex unstructured uncertainty, RS with structured uncertainty: Motivation, The structured singular value and RS, Properties and computation of μ , Robust performance, Application: RP with input uncertainty, μ - synthesis and DK - iteration, Further remarks on μ . Trade - offs in MIMO feedback design, LQG control, H_2 and H_∞ control, H_∞ loop - shaping design.

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Thiruvilvamala, Thiruvananthapuram - 680506

SYLLABUS

Text Books: 1. Sigurd Skogestad and Ian Postlethwaite, Multivariable Feedback Control Analysis and Design - John Wiley & Sons Ltd., 2nd Edition, 2005.

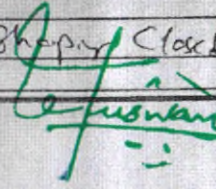
2. D. W. Gu, P. Hr. Petkov and M. M. Konstantinov "Robust Control Design with MATLAB" Spring - Verlag London Ltd., 2005.

References: 1. Kennin Zhou, "Robust and Optimal Control", Prentice Hall, Englewood Cliffs, New Jersey

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| Lecture No. | Topics | Text/Reference Book No. & Section | Teaching Aid Used (ICET, Lecture, GD, Demo, Debate etc.) | Assessment Method used (Assignment, problems, Reading, Quiz, MCQ etc.) | Scheduled on | Delivered on | Reason for Deviation | Signature |
|-------------|--|-----------------------------------|--|--|----------------|----------------|----------------------|----------------------------------|
| | <u>MODULE - I</u> | | | | | | | |
| 1.1 | Review of Classical feedback Control | T, R, | ICET
Lecture | Reading | 23/01
25/01 | 23/01
30/01 | NIL
DUE TO C-OFF | A ₂
A ₂ |
| 1.2 | Review of Control Problem | T, R, | ICET
Lecture | Reading | 30/01
01/02 | 30/01
01/02 | NIL
NIL | A ₂
A ₂ |
| 1.3 | Transfer function | T, R, | ICET
Lecture | Reading | 06/02 | 06/02 | NIL | A ₂
/ |
| 1.4 | Deriving linear models | T, R, | ICET
Lecture | Reading | 08/02 | 08/02 | NIL | A ₂ |
| 1.5 | Frequency response | T, R, | ICET
Lecture | Reading | 13/02 | 13/02 | NIL | A ₂ |
| 1.6 | Feedback Control | T, R, | ICET
Lecture | Reading | 15/02 | 15/02 | NIL | A ₂ |
| 1.7 | Closed loop stability | T, R, | ICET
Lecture | Reading | 27/02 | 27/02 | NIL | A ₂ |
| 1.8 | Evaluation/ Closed loop Performance | T, R, | ICET
Lecture | Reading | 29/02 | 29/02 | NIL | A ₂ |
| 1.9 | Controller design & loop shaping. | T, R, | ICET
Lecture | Reading | 05/03 | 05/03 | NIL | A ₂ |
| 1.10 | Shaping Closed loop transfer function. | T, R, | ICET
Lecture | Reading | 07/03 | 07/03 | NIL | A ₂ |


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LECTURE PLAN

| Lecture No. | Topics | Text/Reference Book No. & Section | Teaching Aid Used (ICET, Lecture, GD, Demo, Debate etc.) | Assessment Method used (Assignment, problems, Reading, Quiz, MCQ etc.) | Scheduled on | Delivered on | Reason for Deviation | Signature |
|-------------|---|-----------------------------------|--|--|--------------|--------------|----------------------|----------------|
| | <u>MODULE - II</u> | | | | | | | |
| 2.1 | Introduction to multi variable control transfer functions for mmo systems | T, R, | ICET Lecture | Reader | 12/03 | 12/03 | NIL | A ₂ |
| 2.2 | Multi variable frequency response analysis | T, R, | ICET Lecture | Reader | 14/03 | 14/03 | NIL | A ₂ |
| 2.3 | Control of multivariable plants | T, R, | ICET Lecture | Reader | 21/03 | 21/03 | NIL | A ₂ |
| 2.4 | Introduction to robustness | T, R, | ICET Lecture | Reader | 26/03 | 26/03 | NIL | A ₂ |
| 2.5 | General problem formulation | T, R, | ICET Lecture | Reader | 02/04 | 02/04 | NIL | A ₂ |
| 2.6 | Elements of linear system theory | T, R, | ICET Lecture | Reader | 04/04 | 03/04 | NIL | A ₂ |
| 2.7 | Internal stability of feedback systems | T, R, | ICET Lecture | Reader | 09/04 | 04/04 | NIL | A ₂ |
| 2.8 | Robustness Control | T, R, | ICET Lecture | Reader | 11/04 | 05/04 | NIL | A ₂ |

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LECTURE PLAN

| Lecture No. | Topics | Text/Reference Book No. & Section | Teaching Aid Used (ICET, Lecture, GD, Demo, Debate etc.) | Assessment Method used (Assignment, problems, Reading, Quiz, MCQ etc.) | Scheduled on | Delivered on | Reason for Deviation | Signature |
|-------------|---|-----------------------------------|--|--|------------------|--------------|----------------------|-----------|
| 2.9 | Input-Output controllability
Perfect control of plant
inversion | T, R, | ICET
Lecture | Ready | 16/04 | 09/04 | NIL | A. |
| 3.0 | Constraints on S & T | T, R, | ICET
Lecture | Ready | 18/04 | 09/04 | NIL | A. |
| | <u>MODULE - III</u> | | | | | | | |
| 3.1 | General control formulation
with uncertainty | T, R, | ICET
Lecture | Ready | 23/04 | 11/04 | NIL | A. |
| 3.2 | Representing uncertainty,
obtaining P, N & M | T, R, | ICET
Lecture | Ready | 25/04 | 12/04 | NIL | A. |
| 3.3 | Definition of robust stability
& performance. | T, R, | ICET
Lecture | Ready | 28/04
(29/04) | 15/04 | NIL | A. |
| 3.4 | Robust stability of the MA
- Structure | T, R, | ICET
Lecture | Ready | 09/05
(29/04) | 16/04 | NIL | A. |
| 3.5 | Robustness RS for Complex
structured uncertainty | T, R, | ICET
Lecture | Ready | 09/05 | 16/04 | NIL | A. |
| 3.6 | Robustness structured uncertainty | T, R, | ICET
Lecture | Ready | 09/05 | 21/04 | NIL | A. |

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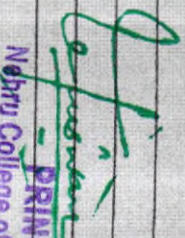
LECTURE PLAN

| Lecture No. | Topics | Text/ Reference Book No. & Section | Teaching Aid Used (ICET, Lecture, GD, Demo, Debate etc.) | Assessment Method used (Assignment, problems, Reading, Quiz, MCQ etc.) | Scheduled on | Delivered on | Reason for Deviation | Signature |
|-------------|--|------------------------------------|--|--|--------------|--------------|----------------------|-----------|
| 3.7 | Mathematical An. structure
Singular value of RS | ICP | ICET
Lecture | Reading | 09/05 | 22/04 | NIL | As |
| 3.8 | Proposed Conceptual of
My Robot performance, APPENDIX | ICP | ICET
Lecture | Reading | 09/05 | 20/04 | NIL | As |
| 3.9 | RP and its uncertainty;
My synthesis of DK-robotics
Further reviews on it | ICP | ICET
Lecture | Reading | 09/05 | 24/04 | NIL | As |
| 3.10 | Trade-offs in mmo
Feedback design, LQG
Control, H2 & H _∞ Control,
H _∞ Loop shaping design | ICP | ICET
Lecture | Reading | 03/05 | 24/04 | NIL | As |

[Signature]
Nannu College of Engineering and
Research Centre (Autonomous)
Nile Ganga, Rampur
Tirunelveli, Tamil Nadu - 626509



| Reg. No. | Name | Students Profile | | |
|-------------|----------------------|------------------|---------|------------------------|
| | | CGPA | Arrears | Hosi /
Pvt Host /DS |
| Neeloleal | Abhiram, M | | | |
| V 002 | Akash, V | | | |
| " 004 | Ashath A.M | | | |
| " 006 | Mithun MADHAV | | | |
| " 007 | MITHUN NATARAJAN | | | |
| " 008 | MUHAMMED NADHUSHA. S | | | |
| " 009 | NILGIRI, R | | | |
| " 010 | RIDHUK, R | | | |
| " 011 | SEERAG, A | | | |
| " 012 | SREYA P.M | | | |
| " 013 | S. RIDHESI | | | |
| " 014 | SEBIN, S | | | |
| KALIELE 015 | ABIDA, A | | | |
| " 017 | ANANDU PRANEEL, G | | | |
| " 018 | ARJUN, V | | | |


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Thiruvithamala, Thrissur - 680688

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| Reg. No. | Name |
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| 020601 | ADITHYAN, M |
| 020602 | ADARSH, V |
| 020603 | ADARSH, A. M |
| 020604 | MIDHUN, MAD |
| 020605 | MIDHUN, NAT |
| 020606 | MUHAMMED, D |
| 020607 | MUHAMMED, R |
| 020608 | RIDHITH, R |
| 020609 | SEERAN, A |
| 020610 | SEERA, P. M |
| 020611 | S. RICHESH |
| 020612 | SUDHAN, S |
| 020613 | ADITHYAN, A |
| 020614 | ANANDU, PRA |
| 020615 | ARJUN, V |

| No. | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 |
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| Dr. | 21 | 26 | 2 | 3 | 4 | 5 | 8 | 9 | 11 | 12 | 15 | 16 | 28 |
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| Dr. | 22 | 22 | 24 | 24 | | | |
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Hrs. | No. of
Hrs. | DL | Atte-
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% | Assignment No. 1
(Out of _____) | Assignment No. 2
(Out of _____) | I st Int. Exam Marks
(Out of 30) | II nd Int. Exam Marks
(Out of _____) | Retest Exam Marks
(Out of _____) | Int. Exams Marks
(Out of _____) | Assignment Marks
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(Out of _____) | Internal Marks
(Out of 30) |
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| 1 | 2 | 25 | | 94% | | | 29 | | | | | | 29 |
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| 3 | 1 | 29 | | 97 | | | 27 | | | | | | 27 |
| 4 | 2 | 25 | | 94 | | | 28 | | | | | | 28 |
| 5 | 2 | 25 | | 94 | | | 28 | | | | | | 28 |
| 6 | 2 | 25 | | 94 | | | 30 | | | | | | 30 |
| 7 | 2 | 25 | | 94 | | | 27 | | | | | | 27 |
| 8 | 6 | 24 | | 80 | | | 26 | | | | | | 26 |
| 9 | 1 | 29 | | 97 | | | 26 | | | | | | 26 |
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| 13 | 6 | 24 | | 80 | | | 25 | | | | | | 25 |
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PAMPADY, THIRUVILWAMALA, THRISSUR DT., KERALA - 680588
NBA ACCREDITED PROGRAMMES - B.TECH CSE, B.TECH MTR | NAAC RE-ACCREDITED WITH 'A' GRADE
RECOGNIZED BY UGC UNDER SECTION(2F) OF THE UGC ACT, 1956 | ISO 9001:2015 CERTIFIED
APPROVED BY AICTE | AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY



VALUE ADDED COURSE EXAMINATION

VALUE ADDED COURSE NAME: Robust Control Systems

Time: 1 Hr

Marks: 30

Date:

Student Name:

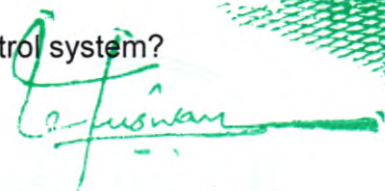
Reg. No:

Department: Electrical and Electronics Engg.

(ANSWER ALL QUESTIONS-EACH CARRY 1 MARK)

(NO NEGATIVE MARKS)

1. What is Control System?
 - a) Control system is a system in which the output is controlled by varying the input
 - b) Control system is a device that will not manage or regulate the behaviour of other devices using control loops
 - c) Control system is a feedback system that can be both positive and negative
 - d) Control System is a system in which the input is controlled by varying the output
2. Which of the following is not the feature of a modern control system?
 - a) Correct power level
 - b) **No oscillation**
 - c) Quick response
 - d) Accuracy
3. What is the characteristic of a good control system?
 - a) **Insensitive to the parameter variation but sensitive to the input commands**
 - b) Neither sensitive to parameter variations nor sensitive to input commands
 - c) Insensitive to the input command
 - d) Sensitive to parameter variation
4. Which of the following element is not used in an automatic control system?
 - a) Final control element
 - b) Sensor
 - c) **Oscillator**
 - d) Error detector


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RECOGNIZED BY UGC UNDER SECTION(2F) OF THE UGC ACT, 1956 | ISO 9001:2015 CERTIFIED

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5. A Control System with excessive noise, is likely to suffer from which of the following?
- Oscillations
 - Saturation in amplifying stages**
 - Loss of gain
 - Vibrations
6. In closed loop control system, what is the sensitivity of the gain of the overall system, M to the variation in G?
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VALUE ADDED COURSE EXAMINATION

VALUE ADDED COURSE NAME: Robust Control Systems

Time: 1 Hr

Marks: 30

Department: Electrical and Electronics Engg.

ANSWER KEY

- | | | |
|-------|-------|-------|
| 1) A | 11) D | 21) D |
| 2) B | 12) C | 22) C |
| 3) A | 13) A | 23) D |
| 4) C | 14) B | 24) D |
| 5) B | 15) A | 25) C |
| 6) B | 16) D | 26) B |
| 7) C | 17) D | 27) A |
| 8) A | 18) B | 28) C |
| 9) A | 19) B | 29) A |
| 10) D | 20) D | 30) A |


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VALUE ADDED COURSE EXAMINATION

VALUE ADDED COURSE NAME: Robust Control Systems

Time: 1 Hr

Date: 24/04

Student Name: ABHIRAM.M

Marks: 30

Reg. No: NCE205EE001

Department: Electrical and Electronics Engg.

(ANSWER ALL QUESTIONS-EACH CARRY 1 MARK)

(NO NEGATIVE MARKS)

29
30
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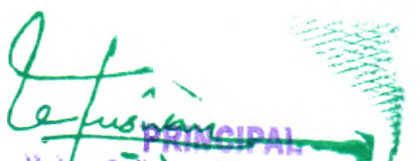
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VALUE ADDED COURSE EXAMINATION

VALUE ADDED COURSE NAME: Robust Control Systems

Time: 1 Hr

Marks: 30

Date: 24/04/24

Student Name: MUHAMMED
BADHUSHA S

Reg. No: NCEL05RE008

Department: Electrical and Electronics Engg.

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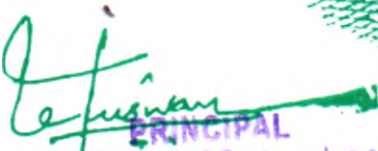
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28. ZMP stands for _____
- a) Zero movement power
 - b) Zero magnetic point
 - c) **Zero moment point** ✓
 - d) Zero metric point
29. ANN stands for _____
- a) **Artificial neural network** ✓
 - b) Arithmetic neural network
 - c) Artificial neural node
 - d) None of the mentioned
30. In ANN, neurons are represented by _____
- a) **Processing element** ✓
 - b) Memory
 - c) Wires
 - d) None of the mentioned


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5. A Control System with excessive noise, is likely to suffer from which of the following?
- a) Oscillations
 - ✓ b) **Saturation in amplifying stages** ✓
 - c) Loss of gain
 - d) Vibrations
6. In closed loop control system, what is the sensitivity of the gain of the overall system, M to the variation in G?
- a) $G/1+GH$
 - ✓ b) **$1/1+GH$** ✓
 - c) $G/1+G$
 - d) $1/1+G$
7. With negative feedback in a closed loop control system, the system sensitivity to parameter variation:
- a) Becomes infinite
 - b) Becomes zero
 - ✓ c) **Decreases** ✓
 - d) Increases
8. Which of the motions in actuators are preferred?
- ✓ a) **Rotary** ✓
 - b) Stationary
 - c) Non-Stationary
 - d) Translator
9. Assertion (A): The servo robot is a closed loop system
Reason(R): It allows for a feedback
- ✓ a) **Both A and R are true and R is not correct explanation of A** ✓
 - b) Both A and R are true but R is not correct explanation of A
 - c) A is true but R is false
 - d) A is false but R is true
10. The basic components of hydraulic fluid power system are :
- a) Reservoir
 - b) Pump and lines
 - c) Actuating devices and control valves
 - ✓ d) **All of the mentioned** ✓



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VALUE ADDED COURSE EXAMINATION

VALUE ADDED COURSE NAME: Robust Control Systems

Time: 1 Hr

Marks: 30

Date: 24-04-24 Student Name: Abidh. A

Reg. No: KNCCE20EE018

Department: Electrical and Electronics Engg.

(ANSWER ALL QUESTIONS-EACH CARRY 1 MARK)

(NO NEGATIVE MARKS)

25
30
AF

1. What is Control System?

- ☒ a) Control system is a system in which the output is controlled by varying the input
- b) Control system is a device that will not manage or regulate the behaviour of other devices using control loops
- c) Control system is a feedback system that can be both positive and negative
- d) Control System is a system in which the input is controlled by varying the output

2. Which of the following is not the feature of a modern control system?

- a) Correct power level
- ☒ b) No oscillation
- c) Quick response
- d) Accuracy

3. What is the characteristic of a good control system?

- ☒ a) Insensitive to the parameter variation but sensitive to the input commands
- b) Neither sensitive to parameter variations nor sensitive to input commands
- c) Insensitive to the input command
- d) Sensitive to parameter variation

4. Which of the following element is not used in an automatic control system?

- a) Final control element
- b) Sensor
- ☒ c) Oscillator
- d) Error detector


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16. The laws of Robotics are:
- a) A robot may not injure a human being
 - b) A robot must obey the order given by human except when conflict with the first law
 - c) A robot must protect its own existence except when it is violating first and second law
 - ☒ d) Both b and c ✓
17. The basic components of robot are:
- a) The mechanical linkage
 - b) Sensors and controllers
 - ☒ c) User interface and power conversion unit
 - d) All of the mentioned ✓
18. Assertion (A): Degree of freedom is defined as the number of variables to define motion in the body in space.
Reason (R): Maximum degree of freedom can be six in a robot.
- a) Both A and R are true and R is not correct explanation of A.
 - ☒ b) Both A and R are true but R is not correct explanation of A. ✓
 - c) A is true but R is false
 - d) A is false but R is true
19. A _____ is connection between parts or links in a robot that allow motion.
- ☒ a) Hinge
 - ☒ b) Joint ✓
 - c) Dis joint
 - d) None of the mentioned
20. Classification of Robot is based on:
- a) Geometry and geometric classification
 - b) Left right classification
 - c) Based on control system
 - ☒ d) All of the mentioned ✓
21. Hierarchical level control involves :
- a) Level 1: Actuator control controls individual robot actuators
 - b) Level 2: Path control coordinates robot path movement
 - c) Level 3: Main control high level instruction interpreter
 - ☒ d) All of the mentioned ✓

11. Deciding the method of control by:
- a) The purpose of valve
 - b) Type of fluid
 - c) Design and purpose of the system
 - d) **All of the mentioned**
12. _____ is the back and forth motion of pistons inside of cylinders that provide the flow of fluid.
- a) Fluid pump
 - b) Gravity pump
 - c) **Reciprocating pump**
 - d) Displacement pump
13. Connectors and fittings are used in the fluid power system :
- a) **To connect to various sections of the fluid lines to each other**
 - b) To detach the fluid lines to the components of the system
 - c) They are used in the high pressure fluid system
 - d) None of the mentioned
14. A _____ translates signals from the controller into the motor voltage and current signals.
- a) Servo motor
 - b) **Servo amplifier**
 - c) AC motor
 - d) DC motor
15. An automatic apparatus or device that performs functions ordinarily ascribed to humans or operate with what appears to be almost human intelligence is called
- a) **Robot**
 - b) Human
 - c) Animals
 - d) Reptiles

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22. Non servo robots are also called as:

- a) Pick and place
- b) Fixed stop robot
- ☒ c) **Both of the mentioned**
- d) None of the mentioned

23. Characteristics of non-servo robot are:

- a) Relatively inexpensive compared to servo robots
- b) Simple, understand and operate
- ☒ c) Precise and reliable
- d) **Open loop system**

24. Which of the following is correct for proximity sensors?

- a) Inductive type
- b) Capacitive type
- c) Ultrasonic wave type
- ☒ d) **All of the mentioned**

25. Which of the following person used the name robot first time in print?

- a) Josef capek
- b) Karel capek
- ☒ c) **Isaac asimov**
- d) None of the mentioned

26. Principles of cybernetics was developed by _____

- a) Josef capek
- ☒ b) **Norbert wiener**
- c) Isaac asimov
- d) Karel capek

27. Which of the following represents muscles of a robot?

- ☒ a) **Actuators**
- b) Power supply
- c) Micro controllers
- d) Robotic arm

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5

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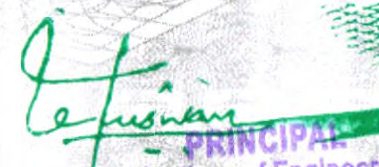
CERTIFICATE

This is to Certify that Mr. ABHIRAM M (NCE20EE001) of Electrical and Electronics Engineering Department has successfully completed the Certificate/Add-on Course on ROBUST CONTROL SYSTEMS

from 23/01/2023 to 24/04/2023 at Nehru College of Engineering & Research Centre, Pamapady.


Course Coordinator


HoD
EEE Department


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Principal
NCERC



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CERTIFICATE

This is to Certify that 1 Mr. ABIDH A (LNCE20EE016) of Electrical and Electronics Engineering Department has successfully completed the Certifictae/Addon Course on ROBUST CONTROL SYSTEMS

from 23/01/2023 to 24/04/2023 at Nehru College of Engineering & Research Centre, Pamapdy.

AJ
Course Coordinator

[Signature]
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EEE Department

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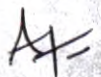
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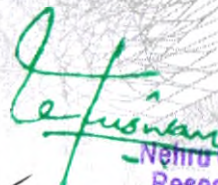
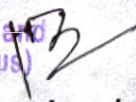
CERTIFICATE

This is to Certify that Mr. MUHAMMED BADHUSHA (NCE20EE008) of Electrical and Electronics Engineering Department has successfully completed the Certificate/Add-on Course on ROBUST CONTROL SYSTEMS

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HoD
EEE Department


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MINUTES OF DEPARTMENT ADVISORY COMMITTEE MEETING HELD ON 05/09/2023

A meeting of the Department Advisory Committee (DAC) was held on 5th July 2023 at 3:00 PM in the chamber of HoD, Mechanical Engineering department.

The following members were present:

1. Dr. APPADURAI M, Associate Professor, MECH
2. Lt. SANOJ T, Assistant Professor, MECH
3. Mr. MANURAJ K R, Assistant Professor, MECH
4. Mr. VIMAL M N, Assistant Professor, MECH
5. Mr. RAHUL R, Assistant Professor, MECH
6. Mr. RAKESH P R, Assistant Professor, MECH
7. Mr. Baisel Paul, Assistant Professor, MECH

The following decisions were taken:

1. It was decided to conduct a certificate course on "Additive Manufacturing" from 11th September 2023 to 17th November 2023 for a period of 30 hours.
2. The course will enhance the technical knowledge of students in the latest developments in the field of automation in manufacturing field.
3. It was decided to provide the course for 2022-26, 2021-25, 2020-24 batch UG students.
4. Also, it was decided to ensure compulsory attendance and staff advisors should monitor the same.

The meeting came to an end at 4:00 PM.





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DEPARTMENT OF MECHANICAL ENGINEERING

The Department of Mechanical Engineering is planning to conduct a 30 hour certificate course scheduled during the months; September to December of this academic year 2023-2024. The course is intended to be beneficial for students in their academics as well as professional life and therefore is offered to all S3/S5/S7 B.Tech Mechanical Engineering students. All students are hereby directed to enroll in the course mandatorily.

COURSE NAME : ADDITIVE MANUFACTURING
PROGRAM CO-ORDINATOR : Dr. Appadurai M
Associate Professor-
Department of Mechanical Engineering
DATE OF COMMENCEMENT : 11th September 2023
COURSE DURATION : 30 Hours



From,

Dr. Appadurai M

Associate Professor

Department Of Mechanical Engineering

Nehru College of Engineering and Research Centre

Pampady, Thrissur

To,

The Principal

Nehru College of Engineering and Research Centre

Pampady, Thrissur

Respected sir,

Sub: Permission to conduct ADD ON Course

The Department of Mechanical Engineering is planning to conduct 30 hour certification course "ADDITIVE MANUFACTURING" scheduled during the months September to December of this academic year 2023-2024 odd semester for S3/S5/S7 B.Tech Mechanical Engineering students.

I humbly request you to kindly grant the permission for the same.

Thanking You,

Place: Pampady

Date: 21/07/2023

Yours Sincerely

Dr. Appadurai M





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ADMISSION NOTIFICATION TO ADD-ON COURSE (2023-2024)

Applications are invited for admission for the Add-On Course 'ADDITIVE MANUFACTURING' offered by the Department of Mechanical Engineering, Nehru college of Engineering and Research Centre, Pampady.

Eligibility Criteria:

All UG/PG Engineering students are Eligible.

Interested Students can give their names to respective class advisors on before 3/08/2023

Timing:

2.00PM to 4.00PM. On Tuesday

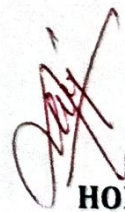
Attendance:

A minimum of 75% attendance is required for writing the examination.

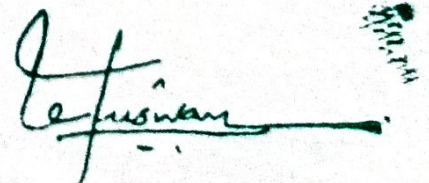
Important Dates:

Commencement of Classes: 9/11/2023

Examination date : 21/12/2023


HOD







DEPARTMENT OF MECHANICAL ENGINEERING

ENROLMENT LIST OF CERTIFICATE COURSE (2023-2024) (ODD SEM)

COURSE NAME: ADDITIVE MANUFACTURING

| S. No | Reg No | Name | Semester | Year |
|-------|-------------|----------------------|----------|------|
| 1. | NCE22ME001 | ABHIJITH S | 3 | II |
| 2. | NCE22ME002 | ABILASH SHARMA | 3 | II |
| 3. | NCE22ME003 | AJMAL P | 3 | II |
| 4. | NCE22ME004 | AKHIL K S | 3 | II |
| 5. | NCE22ME005 | ATHULKRISHNA J | 3 | II |
| 6. | NCE22ME006 | AVINKUMAR P S | 3 | II |
| 7. | NCE22ME007 | KRISHNANUNNI P.S | 3 | II |
| 8. | NCE22ME008 | NEERAJ K | 3 | II |
| 9. | NCE22ME009 | PRAJITH K NAIR | 3 | II |
| 10. | NCE22ME011 | SREERAJ E H | 3 | II |
| 11. | LNCE22ME012 | SANJAY T S | 3 | II |
| 12. | LNCE22ME013 | SAYOOJ K R | 3 | II |
| 13. | LNCE22ME014 | YEDUKRISHNAN T | 3 | II |
| 14. | NCE21ME002 | ABHIJITH R | 5 | III |
| 15. | NCE21ME003 | AJITH K | 5 | III |
| 16. | NCE21ME004 | ASWIN P | 5 | III |
| 17. | NCE21ME005 | HARIKRISHNAN K MENON | 5 | III |
| 18. | NCE21ME007 | K ABHIJITH | 5 | III |
| 19. | NCE21ME008 | KRISHNAJITH U | 5 | III |
| 20. | NCE21ME011 | SIDHARTH P | 5 | III |
| 21. | NCE21ME012 | SINGITH SAJI | 5 | III |
| 22. | NCE21ME013 | SURAJ R | 5 | III |
| 23. | NCE20ME001 | ADHITHYAN M A | 7 | IV |
| 24. | NCE20ME002 | AKASH MENON P | 7 | IV |
| 25. | NCE20ME004 | ARJUN P V | 7 | IV |
| 26. | NCE20ME006 | P S ARJUN NARAYAN | 7 | IV |
| 27. | NCE20ME007 | SRUTHIN C | 7 | IV |
| 28. | NCE20ME008 | S SAIKIRAN | 7 | IV |
| 29. | NCE20ME010 | YADHUKRISHNA K U | 7 | IV |
| 30. | NCE20ME011 | YASWANTH K | 7 | IV |
| 31. | NCE20ME012 | YOUNUS A Y | 7 | IV |
| 32. | LNCE20ME013 | AJITH KANNA | 7 | IV |



[Handwritten signature]

Head of the Department

| Students Profile | | | |
|------------------------|-----------------------------|------|------------------------|
| Reg. No. | Name | CGPA | Host /
Pvt/Host/DOS |
| 1 | NEERAMEDU ADITHYAN.N.A | | |
| 2 | 02 AKASH MENON.P | | |
| 3 | 03 ANAND.U | | |
| 4 | 04 ARJUN.P.V | | |
| 5 | 05 DIVI.K.G | | |
| 6 | 06 P.S.ARJUN NARAYAN | | |
| 7 | 07 SRUTHI.N.C | | |
| 8 | 8 S.SAIRAM | | |
| 9 | 9 VISHNU MOHAN.K | | |
| 10 | 10 YADHUKRISHNA.K.U. | | |
| 11 | 11 YASWATH.K | | |
| 12 | 12 YOUNUS.A.Y | | |
| 13 | 13 AJITH KANNA.K | | |
| 14 | NEELIME 002 ABHISITH A | | |
| 15 | 03 AJITH K | | |
| 16 | 04 ASWIN P | | |
| 17 | 05 HARIKRISHNAN K MENON | | |
| 18 | 07 K ABHISITH | | |
| 19 | 08 KRISHNANATH V | | |
| 20 | 11 SIDDHARTH P | | |
| 21 | 12 SINGITH JAJI | | |
| 22 | 13 SURAS R | | |
| 23 | NEERAMEDU ABHISITH S | | |
| 24 | NEERAMEDU ABILASH SHARMA K. | | |
| 25 | 03 ASHMA P | | |
| 26 | 04 AKHIL K S | | |
| 27 | 05 ATHUL KRISHNAN J | | |
| 28 | 06 AVINKUMAR P S | | |
| 29 | 07 KRISHNANUNNI P | | |
| 30 | 08 NEERAJ K | | |
| 31 | 09 PRASITH K NAIR | | |
| 32 | 11 SREERAJ E.H | | |
| 33 | 12 SANJAY T S | | |
| 34 | 13 SAYJOI K R | | |
| No. of Absentees | | | |
| Initial of the Faculty | | | |

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Mo. | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 10 | 10 | 10 | 10 | 10 | 11 |
| Dt. | 11 | 11 | 18 | 19 | 23 | 25 | 26 | 3 | 7 | 9 | 17 | 30 | 6 |
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| 34 | / | / | / | / | / | / | / | / | / | / | / | / | / |



Signature

| Reg. No. | Na |
|------------------------|--------------------------|
| 1 | NEERAMMOO1 ADITHYAN.M.V |
| 2 | 02 AKASH MENON.J |
| 3 | 03 ANAND.U |
| 4 | 04 ARJUN.P.V |
| 5 | 05 DIVI.K.G |
| 6 | 06 P.S.ARJUN NAR |
| 7 | 07 SRUTHIN.C |
| 8 | 8 S.SAIBRAN |
| 9 | 9 VISHNU MOHAN.H |
| 10 | 10 YADHUKRISHNA |
| 11 | 11 YASWATH.K |
| 12 | 12 YONUS.A.Y |
| 13 | 13 AJITH KANNAR.K |
| 14 | NEELIME 002 ABHISITH R |
| 15 | 03 AJITH K |
| 16 | 04 ASWIN P |
| 17 | 05 HARIKRISHNAN.K |
| 18 | 07 K ABHISITH |
| 19 | 08 KRISHNANATH V |
| 20 | 11 SIDDHARTH P |
| 21 | 12 SINGITH SASI |
| 22 | 13 SURAJ R |
| 23 | NEELAMMOO1 ABHISITH S |
| 24 | NEELAMMOO2 ABILASH SHARM |
| 25 | 03 AJMAL P |
| 26 | 04 AKHIL K S |
| 27 | 05 ATHUL KRISHNA |
| 28 | 06 AVINKUMAR P S |
| 29 | 07 KRISHNANUNNI F |
| 30 | 08 NEERAJ K |
| 31 | 09 PRASITH K NAR |
| 32 | 11 SREERAJ E H |
| 33 | 12 SANJOY T S |
| 34 | 13 SAYIDOT K R |
| No. of Absentees | |
| Initial of the Faculty | |

| Mo. | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 |
|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 7 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 8 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 11 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 12 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 13 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 14 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 15 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 16 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 17 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 18 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 19 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 20 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 21 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 22 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 23 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 24 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 25 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 26 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 27 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 28 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 29 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 30 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 31 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 32 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 33 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 34 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

| Mo. | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 |
|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 7 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 8 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 11 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 12 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 13 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 14 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 15 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 16 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 17 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 18 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 19 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 20 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 21 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 22 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 23 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 24 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 25 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 26 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 27 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 28 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 29 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 30 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 31 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 32 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 33 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 34 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |



Signature



DEPARTMENT OF MECHANICAL ENGINEERING
CERTIFICATE COURSE 2023-24 ODD SEMESTER-EXAM

COURSE NAME: ADDITIVE MANUFACTURING

Time : 1 Hr

Max Marks : 50

Answer all Questions
(Each carries 2 Marks)

1. From following, the alternative name for RP is _____

- (A) Additive Manufacturing
- (B) Layer Manufacturing
- (C) Direct CAD Manufacturing
- (D) All of the above

2. Which of the following is not Liquid-based RP system?

- (A) Stereo lithography Apparatus (SLA)
- (B) Laminated Object Manufacturing (LOM)
- (C) Solid Ground Curing (SGC)
- (D) Solid Object Ultraviolet-Laser Printer (SOUP)

3. Which of the following is not subtractive process?

- (A) Milling
- (B) Stereo-lithography
- (C) Sawing
- (D) EDM

4. Choose the correct sequence to generate prototype.

- (A) 3D CAD data - CAD solid model - STL file - RP prototype
- (B) CAD solid model - 3D CAD data - RP prototype - STL file
- (C) STL file - 3D CAD data - CAD solid model - RP prototype
- (D) 3D CAD data - STL file - CAD solid model - RP prototype

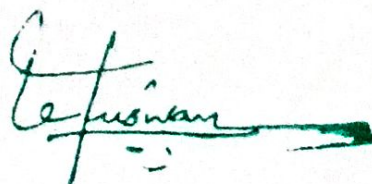
5. Full form of STL is _____.

- (A) Straight-lithography
- (B) Streto-lithography
- (C) Stereo-lithography
- (D) Straight-lipsography

6. What is the full name of SLS?

- (A) Selective Laser Simulator
- (B) Sintering Laser Simulator
- (C) Selective Laser Sintering
- (D) Stereolithography Laser Sintering





7. Process of converting STL file model in to layers is called _____ in RP.

- (A) Chopping
- (B) Slicing
- (C) Cutting
- (D) Trimming

8. Which of the following aspects is mainly concerned with molding the final shape around the basic skeleton?

- (A) Functional aspect
- (B) Operational aspect
- (C) Aesthetic aspect
- (D) None of these

9. The STL files translate the part geometry from a CAD system to _____.

- (A) CNC machine
- (B) CMM machine
- (C) RP machine
- (D) CAPP machine

10. In the _____ process, one starts with a single block of solid material larger than the final size of the desired object and material is removed until the desired shape is reached.

- (A) Subtractive process
- (B) Additive process
- (C) Formative process
- (D) All of above

11. Which of the following addresses the need to design a product for safety?

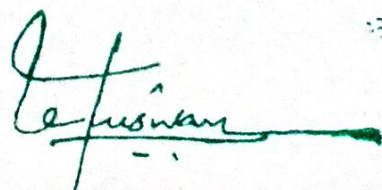
- (A) Soft-Hard Review
- (B) Effect Analysis
- (C) Experimental design
- (D) None of these

12. Full form of FDM is _____.

- (A) Fixed Development Modelling
- (B) Fusion Development Modelling
- (C) Fused Deposition Modelling
- (D) Focused Deposition Modelling

13. The process of obtaining a geometric CAD model from 3D points acquired by scanning/digitizing existing parts/products is best known as:

- (A) Forward Engineering
- (B) Backward Engineering
- (C) Reverse Engineering
- (D) Product Engineering



14. In the entire reverse engineering process for product design, which one is the first step?

- (A) CAD model updating
- (B) CAD modeling
- (C) Data pre-processing
- (D) Data capturing

15. Which of the following RP system is not developed by 3D systems?

- (A) Selective Laser Sintering (SLS)
- (B) Multi-Jet Modeling System (MJM)
- (C) Paper Lamination Technology (PLT)
- (D) Stereo lithography Apparatus (SLA)

16. Which of the following is used as base material in Stereolithography (SLA) process?

- (A) Thermoplastics, Metals powders
- (B) Thermoplastics, Eutectic metals.
- (C) Photopolymer
- (D) Titanium alloys

17. What is the third step in Reverse Engineering?

- (A) Digitization of the object
- (B) Creation of CAD model
- (C) Prototype
- (D) None of these

18. Which of the following advantage does not possess by the rapid prototyping process over the traditional prototyping process?

- (A) It consumes less time
- (B) Gives better quality
- (C) Reduces product launch time
- (D) It's cheaper

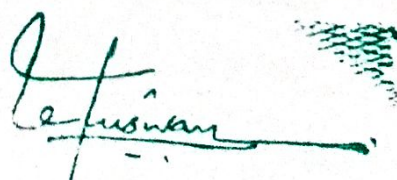
19. Which kind of laser is used to cut the sheets in LOM?

- (A) Ruby Laser
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- (C) He-Ne Laser
- (D) None of these

20. STL file format is represented by interaction of ____.

- (A) lines and hexagons
- (B) lines and rectangles
- (C) lines and triangles
- (D) lines and circles







21. Which among the following processes, is most important part of product development?

- (A) Packaging
- (B) Purchasing
- (C) Engineering Design Process
- (D) Marketing

22. Which material can be efficiently used as a support material?

- (A) ABS
- (B) PLA
- (C) Nylon
- (D) INF

23. Which file format cannot be converted into STL file format?

- (A) .prt
- (B) .sld
- (C) .dwg
- (D) .stp

24. STL files contains _____.

- (A) Mass properties of the model
- (B) Geometrical data
- (C) Drawing data
- (D) all of the above

25. To meet the customer's demand in today's market, we need:

- (A) Rapid Manufacturing
- (B) Conventional Manufacturing
- (C) Unconditional Manufacturing
- (D) None of these





NEHRU COLLEGE OF ENGINEERING AND RESEARCH CENTRE

(NAAC Re Accredited with A Grade)

(Approved by AICTE, Affiliated to APJ Abdul Kalam Technological University, Kerala)



DEPARTMENT OF MECHANICAL ENGINEERING

ENROLMENT LIST OF CERTIFICATE COURSE (2023-2024) (ODD SEM)

**COURSE NAME: ADDITIVE MANUFACTURING
ANSWER KEY**

1. (Ans:d)
2. (Ans:b)
3. (Ans:b)
4. (Ans:a)
5. (Ans:c)
6. (Ans:c)
7. (Ans:b)
8. (Ans:c)
9. (Ans:c)
10. (Ans:a)
11. (Ans:a)
12. (Ans:c)
13. (Ans:c)
14. (Ans:d)
15. (Ans:c)
16. (Ans:c)
17. (Ans:b)
18. (Ans:d)
19. (Ans:b)
20. (Ans:c)
21. (Ans:c)
22. (Ans:d)
23. (Ans:c)
24. (Ans:b)
25. (Ans:a)



Signature



DEPARTMENT OF MECHANICAL ENGINEERING

CERTIFICATE COURSE 2023-24 ODD SEMESTER-EXAM

COURSE NAME: ADDITIVE MANUFACTURING

Time : 1 Hr

Max Marks : 50

Student Name: Neeraj K N

Class: S4

**Answer all Questions
(Each carries 2 Marks)**

1. From following, the alternative name for RP is _____

- (A) Additive Manufacturing
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5. Full form of STL is _____.

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DEPARTMENT OF MECHANICAL ENGINEERING

CERTIFICATE COURSE 2023-24 ODD SEMESTER-EXAM

COURSE NAME: ADDITIVE MANUFACTURING

Time : 1 Hr

Max Marks : 50

Student Name: YADHUKRISHNA K U.

Class: 53

**Answer all Questions
(Each carries 2 Marks)**

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DEPARTMENT OF MECHANICAL ENGINEERING

CERTIFICATE COURSE 2023-24 ODD SEMESTER-EXAM

COURSE NAME: ADDITIVE MANUFACTURING

Time : 1 Hr

Max Marks : 50

Student Name: Abhilash

Class: SE

**Answer all Questions
(Each carries 2 Marks)**

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- (D) EDM

4. Choose the correct sequence to generate prototype.

- ☒ (A) 3D CAD data - CAD solid model - STL file - RP prototype
- (B) CAD solid model - 3D CAD data - RP prototype - STL file
- (C) STL file - 3D CAD data - CAD solid model - RP prototype
- (D) 3D CAD data - STL file - CAD solid model - RP prototype

5. Full form of STL is _____.

- (A) Straight-lithography
- (B) Stereo-lithography
- ☒ (C) Stereo-lithography
- (D) Straight-lithography

6. What is the full name of SLS?

- (A) Selective Laser Simulator
- (B) Sintering Laser Simulator
- ☒ (C) Selective Laser Sintering
- (D) Stereolithography Laser Sintering



7. Process of converting STL file model in to layers is called _____ in RP.

- (A) Chopping
- (B) Slicing
- ☒ (C) Cutting
- (D) Trimming

8. Which of the following aspects is mainly concerned with molding the final shape around the basic skeleton?

- (A) Functional aspect
- (B) Operational aspect
- ☒ (C) Aesthetic aspect
- (D) None of these

9. The STL files translate the part geometry from a CAD system to _____.

- (A) CNC machine
- (B) CMM machine
- ☒ (C) RP machine
- (D) CAPP machine

10. In the _____ process, one starts with a single block of solid material larger than the final size of the desired object and material is removed until the desired shape is reached.

- ☒ (A) Subtractive process
- (B) Additive process
- (C) Formative process
- (D) All of above

11. Which of the following addresses the need to design a product for safety?

- (A) Soft-Hard Review
- ☒ (B) Effect Analysis
- (C) Experimental design
- (D) None of these

12. Full form of FDM is _____.

- (A) Fixed Development Modelling
- ☒ (B) Fusion Development Modelling
- (C) Fused Deposition Modelling
- (D) Focused Deposition Modelling

13. The process of obtaining a geometric CAD model from 3D points acquired by scanning/digitizing existing parts/products is best known as:

- (A) Forward Engineering
- (B) Backward Engineering
- ☒ (C) Reverse Engineering
- (D) Product Engineering



14. In the entire reverse engineering process for product design, which one is the first step?

- (A) CAD model updating
- (B) CAD modeling
- ☒ (C) Data pre-processing
- (D) Data capturing

15. Which of the following RP system is not developed by 3D systems?

- (A) Selective Laser Sintering (SLS)
- (B) Multi-Jet Modeling System (MJM)
- ☒ (C) Paper Lamination Technology (PLT)
- (D) Stereo lithography Apparatus (SLA)

16. Which of the following is used as base material in Stereolithography (SLA) process?

- (A) Thermoplastics, Metals powders
- (B) Thermoplastics, Eutectic metals.
- ☒ (C) Photopolymer
- (D) Titanium alloys

17. What is the third step in Reverse Engineering?

- (A) Digitization of the object
- ☒ (B) Creation of CAD model
- (C) Prototype
- (D) None of these

18. Which of the following advantage does not possess by the rapid prototyping process over the traditional prototyping process?

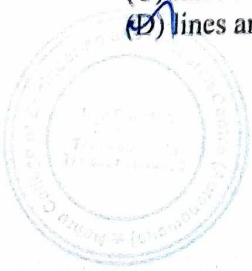
- (A) It consumes less time
- (B) Gives better quality
- (C) Reduces product launch time
- ☒ (D) It's cheaper

19. Which kind of laser is used to cut the sheets in LOM?

- (A) Ruby Laser
- (B) Carbon Dioxide Laser
- ☒ (C) He-Ne Laser
- (D) None of these

20. STL file format is represented by interaction of ____.

- (A) lines and hexagons
- (B) lines and rectangles
- (C) lines and triangles
- ☒ (D) lines and circles





21. Which among the following processes, is most important part of product development?

- (A) Packaging
- (B) Purchasing
- ☒ (C) Engineering Design Process
- (D) Marketing

22. Which material can be efficiently used as a support material?

- (A) ABS
- (B) PLA
- (C) Nylon
- ☒ (D) INF

23. Which file format cannot be converted into STL file format?

- (A) .prt
- (B) .sld
- ☒ (C) .dwg
- (D) .stp

24. STL files contains _____.

- (A) Mass properties of the model
- ☒ (B) Geometrical data
- (C) Drawing data
- (D) all of the above

25. To meet the customer's demand in today's market, we need:

- ☒ (A) Rapid Manufacturing
- (B) Conventional Manufacturing
- (C) Unconditional Manufacturing
- (D) None of these



NEHRU COLLEGE OF ENGINEERING AND RESEARCH CENTRE

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DEPARTMENT OF MECHANICAL ENGINEERING

MARK LIST OF CERTIFICATE COURSE (2023-2024) (ODD SEM)

COURSE NAME: ADDITIVE MANUFACTURING

| S. No | Reg No | Name | Semester | Year | Marks (50) |
|-------|-------------|----------------------|----------|------|------------|
| 1. | NCE22ME001 | ABHIJITH S | 3 | II | 41 |
| 2. | NCE22ME002 | ABILASH SHARMA | 3 | II | 39 |
| 3. | NCE22ME003 | AJMAL P | 3 | II | 45 |
| 4. | NCE22ME004 | AKHIL K S | 3 | II | 45 |
| 5. | NCE22ME005 | ATHULKRISHNA J | 3 | II | 38 |
| 6. | NCE22ME006 | AVINKUMAR P S | 3 | II | 40 |
| 7. | NCE22ME007 | KRISHNANUNNI P.S | 3 | II | 46 |
| 8. | NCE22ME008 | NEERAJ K | 3 | II | 45 |
| 9. | NCE22ME009 | PRAJITH K NAIR | 3 | II | 38 |
| 10. | NCE22ME011 | SREERAJ E H | 3 | II | 39 |
| 11. | LNCE22ME012 | SANJAY T S | 3 | II | 44 |
| 12. | LNCE22ME013 | SAYOOJ K R | 3 | II | 44 |
| 13. | LNCE22ME014 | YEDUKRISHNAN T | 3 | II | 46 |
| 14. | NCE21ME002 | ABHIJITH R | 5 | III | 41 |
| 15. | NCE21ME003 | AJITH K | 5 | III | 44 |
| 16. | NCE21ME004 | ASWIN P | 5 | III | 43 |
| 17. | NCE21ME005 | HARIKRISHNAN K MENON | 5 | III | 40 |
| 18. | NCE21ME007 | K ABHIJITH | 5 | III | 42 |
| 19. | NCE21ME008 | KRISHNAJITH U | 5 | III | 38 |
| 20. | NCE21ME011 | SIDHARTH P | 5 | III | 46 |
| 21. | NCE21ME012 | SINGITH SAJI | 5 | III | 42 |
| 22. | NCE21ME013 | SURAJ R | 5 | III | 39 |
| 23. | NCE20ME001 | ADHITHYAN M A | 7 | IV | 41 |
| 24. | NCE20ME002 | AKASH MENON P | 7 | IV | 38 |
| 25. | NCE20ME004 | ARJUN P V | 7 | IV | 45 |
| 26. | NCE20ME006 | P S ARJUN NARAYAN | 7 | IV | 45 |
| 27. | NCE20ME007 | SRUTHIN C | 7 | IV | 38 |
| 28. | NCE20ME008 | S SAIKIRAN | 7 | IV | 42 |
| 29. | NCE20ME010 | YADHUKRISHNA K U | 7 | IV | 44 |
| 30. | NCE20ME011 | YASWANTH K | 7 | IV | 43 |
| 31. | NCE20ME012 | YOUNUS A Y | 7 | IV | 39 |
| 32. | LNCE20ME013 | AJITH KANNA | 7 | IV | 45 |

Course Coordinator

Head of the Department



[Handwritten Signature]

Certificate ID U8WE8Y-CE000012



CERTIFICATE

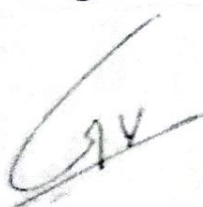
OF COMPLETION



This certificate is proudly presented to

YADHUKRISHNA K U

had successfully completed Add on Course - **Additive Manufacturing Processes** during the academic year 2023-2024 conducted by **Department of Mechanical Engineering** at Nehru College of Engineering and Research Centre, Pampady, Thrissur.


Program Coordinator


Head of the Department

Certificate ID U8WE8Y-CE000019



CERTIFICATE

OF COMPLETION



This certificate is proudly presented to

ABHISHEK M

had successfully completed Add on Course - **Additive Manufacturing Processes** during the academic year 2023-2024 conducted by **Department of Mechanical Engineering** at Nehru College of Engineering and Research Centre, Pampady, Thrissur.

Program Coordinator



Head of the Department

Certificate ID U8WE8Y-CE000023



CERTIFICATE

OF COMPLETION



This certificate is proudly presented to

NEERAJ K N

had successfully completed Add on Course - Additive Manufacturing Processes during the academic year 2023-2024 conducted by Department of Mechanical Engineering at Nehru College of Engineering and Research Centre, Pampady, Thrissur.


Program Coordinator


Head of the Department

Made for free with Certify'em

Certificate ID U8WE8Y-CE000018



CERTIFICATE

OF COMPLETION



This certificate is proudly presented to

ATHULKRISHNA C

had successfully completed Add on Course - **Additive Manufacturing Processes** during the academic year 2023-2024 conducted by **Department of Mechanical Engineering** at Nehru College of Engineering and Research Centre, Pampady, Thrissur.


Program Coordinator


Head of the Department

FROM

Ms. NEETHU M

ASSISTANT PROFESSOR

MTR DEPARTMENT, NCERC PAMPADY

TO

THE PRINCIPAL,

NCERC PAMPADY

Through HOD

Respected Mam,

SUBJECT: Requisition for conducting Certification Course on "IOT using ARDUINO" Reg.

Students need a deep understanding of upcoming methodologies to enhance knowledge dissemination for doing projects. IOT using ARDUINO based on combination of hardware and software provided that both should be synchronized with each other. In this course students will be able to understand works in terms of physical board and libraries and the IDE (Integrated Development Environment), so Mechatronics Engineering department would like to conduct a Certification Course on "IOT using ARDUINO" from 17-07-2023. It will be a 30 hour course scheduled for February to May of this academic year 2022-2023. Kindly request you to give the permission for the same.

All UG Engineering students of MTR Department are eligible for this course.

Sincerely,

PLACE: NCERC

DATE: 17/07/23



PRINCIPAL
Nehru College of Engineering and
Research Centre (Autonomous)
Nila Gardens, Pampady
Thiruvilwamala, Thrissur - 680588

FROM

MS NEETHU M

ASSISTANT PROFESSOR

MTR DEPARTMENT, NCERC PAMPADY

TO

HEAD OF THE DEPARTMENT

MTR DEPARTMENT

NCERC PAMPADY

SUBJECT: Requisition for conducting Certification Course on "IOT using ARDUINO" Reg.

Respected Mam,

As the Assistant Professor of Mechatronics Engineering, I would like to request your support and permission to conduct a certification course on "IOT using ARDUINO" from 17-07-2023. It will be a 30 hour course scheduled for February to May of this academic year 2023-2024. It is therefore important for students to have a deep understanding of upcoming methodologies to enhance knowledge dissemination to students for doing projects.

All UG Engineering students of MTR Department are eligible for this course.

Sincerely,

PLACE: NCERC

DATE: 12/07/23

FROM



Principal
Nehru College of Engineering and
Research Centre (Autonomous)
Nila Gardens, Pampady
Thiruvilwamala, Thrissur - 680588



**NEHRU COLLEGE OF ENGINEERING AND
RESEARCH CENTRE**
PAMPADY, THIRUVILWAMALA, THRISSUR DIST, KERALA-680588



(Approved by AICTE, Affiliated to APJ Abdul Kalam Technological University, Kerala)

DEPARTMENT OF MECHATRONICS ENGINEERING

The Department of Mechatronics Engineering is planning to conduct a 30 hour certificate course scheduled during the months; February to may of this academic year 2023-2024. The course is intended to be beneficial for students in their academics as well as professional life and therefore is offered to all **S5 B.Tech Mechatronics Engineering students**. All students are hereby directed to enroll in the course mandatorily.

COURSE NAME : IOT using ARDUINO

PROGRAM CO-ORDINATOR : Ms. NEETHU M
Assistant Professor ,Department of Mechatronics Engg

DATE OF COMMENCEMENT : 17th JULY , 2023

COURSE DURATION : 30 Hours



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NCERC/3125/S/AC/09/23

CIRCULAR

Subject: NCERC-Conduct of DAC&PAC meeting by all departments for the even semester of academic year 2023-24 Reg...

It is communicated to all department heads prior to the start of the upcoming even semester for APJKTU, which will begin in January. As a result, the Hods are requested to convene a meeting of the Department Advisory Committee (DAC) and the program Assessment Committee (PAC) before 20th Dec, 2023 in order to continuously evaluate and enhance the program's outcomes in all domains of programme, academic, non-academic and accreditation process.

Srinivasappa
Principal

Copy to:

All Heads of the Departments, Faculty members, NBA coordinators, office superintendent, Welfare officer, Work shop superintendent, HR, Academic Superintendent, Chairman and Managing Trustee.



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Nila Gardens, Pampady
Thiruvilwamala, Thrissur - 680588

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NEHRU COLLEGE OF ENGINEERING AND RESEARCH CENTRE
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DEPARTMENT OF MECHATRONICS
DEPARTMENT ADVISORY COMMITTEE(DAC)
MINUTES OF MEETING-20 /12/23

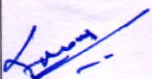
The Department Advisory committee (DAC) of the Mechatronics Engineering program was established on July 5, 2016, with the goal of regularly reviewing the program outcomes in all academic, non-academic, and accrediting processes. The DAC had its meeting on Dec 20/12/2023 in the board room Aryabhata block, NCERC, Pampady.

The meeting had started by 10:00 AM and the following faculty member, Academicians, Industrial persons and students' representatives had attended the meeting :

| s.n
o | Designation | Name | Attendance |
|----------|---|--|------------|
| 1 | Principal | Prof. (Dr). Karibasappa Kwadiki | |
| 2 | Head of the Department | Dr. Vijayakumar. K. | |
| 3 | Faculty Representatives from Department | Mr. Midhunraj P K
Ms. Neethu M | |
| 4 | Academic experts from other institutions/universities | Dr. Lalu, professor, GEC Thrissur | |
| 5 | Industrial Experts | Mr. Jevin George, Mahindra & Mahindra, Chennai | ABSENT |
| 6 | Student Representatives | Ms. Smruthy Ranjith
Mr. Rajith Krishnan | |



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Thiruvilwamala, Thrissur - 680588

| | | | |
|---|------------------------|----------------------------------|--|
| | | | |
| 7 | Alumini Representative | Mr.Ribin Mathew
Mr.Ebin sunny | 
 |
| 8 | NBA Coordinator | Mr Midhunraj P K |  |

Dr.K G Vishwanadhan, Chairman of DAC starts the session with a silent prayer in honour of our beloved Founder chairman, Late Sri.P.K.Das. The following points were discussed:

POINTS DISCUSSED

- 1.DAC recommend all faculties to join in professional societies like IEEE,ISTE,IAENG Etc...
- 2.The committee reviewed the quality of design projects by S5 students and phase I projects of final years.
- 3.The committee went over the process of identifying slow learners and the remedial classes that were offered.

ACTION TAKEN

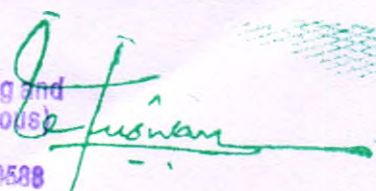
- 1.The remedial class registers were reviewed by DAC, and the slow learners class mentors were instructed to undertake slow learners counselling sessions in order to improve the results.
- 2.The committee made necessary modifications and recommended all class advisors to prepare individual attainments for each batch.
- 3.DAC recommend the department to create opportunities to students as well as faculties to join in professional societies like IEEE,ISTE,IAENG Etc...
- 4.The committee introduced a ADD-ON course "IOT using ARDUINO".

Secretary

Chairman



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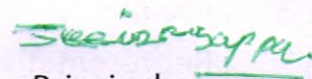


NCERC/3125/AC/09/23

CIRCULAR

Subject: NCERC-Conduct of DAC&PAC meeting by all departments for the ODD semester of academic year 2023-24 Reg...

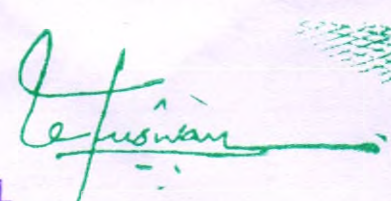
It is communicated to all department heads prior to the start of the upcoming odd semester for APJKTU, which will begin in August. As a result, the Hods are requested to convene a meeting of the Department Advisory Committee (DAC) and the program Assessment Committee (PAC) before 21st JULY, 2023 in order to continuously evaluate and enhance the program's outcomes in all domains of programme academic, non-academic and accreditation process.


Principal

Copy to:

All Heads of the Departments, Faculty members, NBA coordinators, office superintend, Welfare officer, Work shop superintend, HR, Academic Superintend, Chairman and Managing Trustee.




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**DEPARTMENT OF MECHATRONICS
DEPARTMENT ADVISORY COMMITTEE(DAC)
MINUTES OF MEETING- 22 /07 /23**

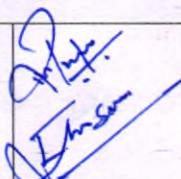
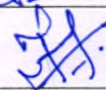
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The meeting had started by 10:00 AM and the following faculty member, Academicians, Industrial persons and students' representatives had attended the meeting :

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|----------|---|--|------------|
| 1 | Principal | Prof. (Dr). Karibasappa
Kwadike | |
| 2 | Head of the
Department | Dr. vijayakumar. k. | |
| 3 | Faculty
Representatives
from Department | Mr. Midhunraj P K
Ms. Neethu M | |
| 4 | Academic experts
from other
institutions/universi
ties | Dr. Lalu, professor, GECThrissur | |
| 5 | Industrial Experts | Mr. Jevin George, Mahindra & Mahindra, Chennai | ABSENT |
| 6 | Student
Representatives | Ms. Smruthy Ranjith
Mr. Rajith Krishnan | |



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Thrissur - 680588

| | | | |
|---|-----------------------|----------------------------------|---|
| 7 | Alumni Representative | Mr.Ribin Mathew
Mr.Ebin sunny |  |
| 8 | NBA Coordinator | Mr.Midhunraj P K |  |

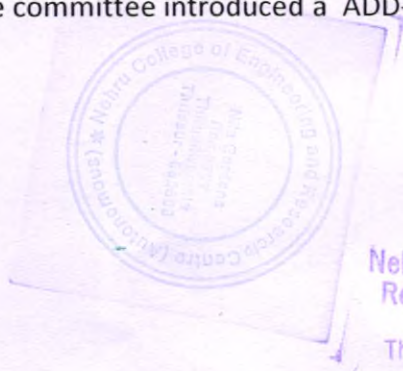
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POINTS DISCUSSED

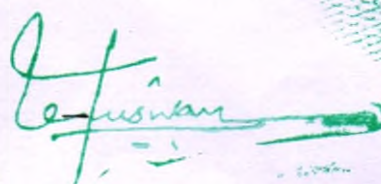
- 1.The committee examined how to implement and make all course outcomes known to students,as well as how to map them with Pos and PSOs using various platforms.
- 2.The committee discussed the quality of the content beyond the subjects and the circulation of the same.
- 3.The committee suggested conducting remedial class for slow learners.
- 4.The DAC also encouraged the s5 class advisor to encourage students to persue research oriented design projects in order to strengthen the department's R&D operations.
- 5.The committee also recommended that students use project.
- 6.Artificial intelligence Laboratory can be included.
- 7.Robotic operating system can be added for the upcoming semester to fill curricular gaps.
- 8.The committee examined the performance of department association and its related activities.

ACTION TAKEN

- 1.The committee reviewed students projects and advised faculty advisors to motivate students to do their projects in innovative areas.
- 2.The committee encouraged all faculties to upload the course materials in various digital platforms for students circulation, committee also suggest to include course outcomes, content beyond the syllabus etc... in the same.
- 3.The committee encouraged all class advisors to categorise students based on academic performance, give remedial classes for slow learners, and keep all appropriate departmental documentation on file.
- 4.The committee introduced a ADD-ON course "IOT using ARDUINO".



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SECRETARY CHAIRMAN

SYLLABUS:

1. Introduction to IOT

- Understanding IoT fundamentals
- IoT Architecture and protocols
- Various Platforms for IoT
- Realtime Examples of IoT
- Overview of IoT components and IoT Communication Technologies
- Challenges in IoT

2. Arduino Simulation Environment

- Arduino Uno Architecture
- Setup the IDE, Writing Arduino Software
- Arduino Libraries
- Basics of Embedded C programming for Arduino
- Interfacing LED, push button

3. Sensor and Actuators with Arduino

- Overview of Sensors working
- Analog and Digital Sensors
- Interfacing of Temperature, Humidity, Motion, Light and Gas Sensor with Arduino
- Interfacing of Actuators with Arduino.
- Interfacing of Relay Switch and Servo Motor with Arduino

4. Basic Networking with ESP8266 Wi-Fi module

- Basics of Wireless Networking
- Introduction to ESP8266 Wi-Fi Module
- Various Wi-Fi library
- Web server - introduction, installation, configuration
- Posting sensor(s) data to web server

5. Cloud Platforms for IOT

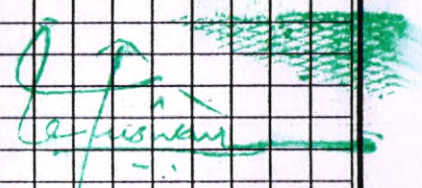
- Virtualization concepts and Cloud Architecture
- Cloud computing, benefits
- Cloud services -- SaaS, PaaS, IaaS
- Cloud providers & offerings
- Study of IOT Cloud platforms
- ThingSpeak API and MQTT
- Interfacing ESP8266 with Web services



PRINCIPAL
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Nila Gardens, Pampady
Thruvilwamala, Thrissur - 680506

| | Reg. No. | Name | Students Profile | | |
|------------------------|------------|-------------------|------------------|---------|------------------------|
| | | | CGPA | Arrears | Host./
Pvt.Host./DS |
| 1 | NCE22MC001 | Abdul Nahas | | | |
| 2 | 002 | Abhyuth Venu | | | |
| 3 | 003 | Adithyan | | | |
| 4 | 005 | Afsal | | | |
| 5 | 006 | Alan Baby | | | |
| 6 | 007 | Asun Krishna S | | | |
| 7 | 008 | Aswin Krishna R | | | |
| 8 | 009 | Aswin Nair N | | | |
| 9 | 010 | Aswin T T | | | |
| 10 | 011 | Athul Krishna | | | |
| 11 | 012 | Basil M prasad | | | |
| 12 | 013 | Gowri Sankar Das | | | |
| 13 | 014 | Karthik Sai | | | |
| 14 | 015 | Moh. Habeeb Hasan | | | |
| 15 | 016 | Moh. Nufais | | | |
| 16 | 017 | Moh. Fayis | | | |
| 17 | 018 | Moh. Mubsin | | | |
| 18 | 019 | Moh. Shifad | | | |
| 19 | 020 | Sachidanand | | | |
| 20 | 021 | Sidharth | | | |
| 21 | 022 | Normal nathi | | | |
| 22 | 010 | Aswin | | | |
| 23 | | | | | |
| 24 | | | | | |
| 25 | | | | | |
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| 30 | | | | | |
| 31 | | | | | |
| 32 | | | | | |
| 33 | | | | | |
| 34 | | | | | |
| No. of Absentees | | | | | |
| Initial of the Faculty | | | | | |

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Mo. | AUG | AUG | AUG | AUG | SEP | SEP | SEP | SEP | SEP | SEP | SEP | SEP | SEP |
| Dt. | 24 | 26 | 31 | 31 | 22 | 03 | 05 | 10 | 13 | 15 | 17 | 19 | 24 |
| Hr. | 5 | 6 | 6 | 6 | 5 | 6 | 5 | 5 | 6 | 6 | 6 | 5 | 6 |
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| 003 | 3 | A | A | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 005 | 4 | 1 | 1 | 1 | 1 | 1 | A | 1 | 1 | 1 | 1 | 1 | 1 |
| 006 | 5 | 1 | 1 | 1 | 1 | 1 | 1 | A | 1 | 1 | 1 | 1 | 1 |
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| | Reg. No. | Nan |
|------------------------|------------|--------------|
| 1 | NCF22MC001 | Abdul Nahu |
| 2 | 002 | Abhyuth Venu |
| 3 | 003 | Adithyan |
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| 5 | 005 | Alan Baby |
| 6 | 007 | Arun Krishn |
| 7 | 008 | Aswin Krishn |
| 8 | 009 | Aswin Nair |
| 9 | 010 | Aswin T.T |
| 10 | 011 | Athul Krishn |
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| 12 | 013 | Gowri Sankar |
| 13 | 014 | Karthik Raj |
| 14 | 015 | Moh. Habeeb |
| 15 | 016 | Moh. Nufar |
| 16 | 017 | Moh. Fayis |
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IOT using ARDUINO

1. Which of the following is NOT a key characteristic of IoT?
 - a) Real-time data collection
 - b) Remote control and monitoring
 - c) High energy consumption
 - d) Autonomous decision-making
2. Which IoT protocol is designed for low-power, low-bandwidth communication?
 - a) HTTP
 - b) MQTT
 - c) CoAP
 - d) FTP
3. What is the purpose of the IoT architecture layer called the "Perception Layer"?
 - a) Collects data from physical sensors
 - b) Processes data in real-time
 - c) Stores data in a cloud platform
 - d) Secures communication between devices
4. Which of the following is a real-time example of IoT?
 - a) Social media platforms
 - b) Smart thermostats
 - c) Email services
 - d) Video streaming apps
5. Which of the following is a challenge faced in IoT implementations?
 - a) Excessive network bandwidth
 - b) Data security and privacy issues
 - c) Unavailability of cloud storage
 - d) Lack of cloud computing infrastructure
6. Which of the following components is found in the Arduino Uno architecture?
 - a) ARM Cortex processor
 - b) AVR microcontroller
 - c) Raspberry Pi processor
 - d) ESP32 microcontroller
7. Which tool is used to write and upload code to an Arduino board?
 - a) Arduino IDE
 - b) MATLAB
 - c) Python
 - d) Visual Studio Code

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8. In Arduino programming, which of the following is a standard function?

- a) setup()
- b) execute()
- c) process()
- d) start()

9. What is the purpose of Arduino libraries?

- a) To interact with external hardware components
- b) To write complex code from scratch
- c) To modify the Arduino hardware
- d) To connect Arduino to the internet

10. Which programming language is primarily used for Arduino development?

- a) Python
- b) Embedded C
- c) Java
- d) JavaScript

11. Which of the following sensors is used to measure temperature?

- a) PIR sensor
- b) LM35 sensor
- c) MQ-2 sensor
- d) Photoresistor

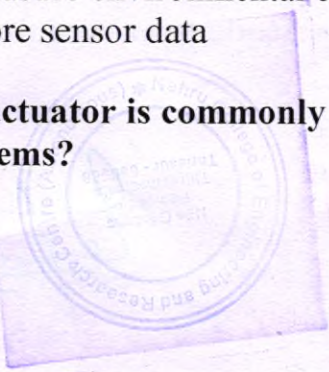
12. What is the main difference between analog and digital sensors?

- a) Analog sensors output continuous signals, while digital sensors output discrete signals
- b) Analog sensors are less accurate than digital sensors
- c) Analog sensors require more power than digital sensors
- d) Digital sensors require more calibration than analog sensors

13. What is the purpose of a relay switch in an IoT system?

- a) To convert digital signals to analog signals
- b) To control high-voltage devices with low-voltage signals
- c) To measure environmental conditions
- d) To store sensor data

14. Which actuator is commonly used to control position or movement in IoT systems?



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- a) Servo motor
- b) Humidity sensor
- c) Motion detector
- d) Photoresistor

15. Which sensor is commonly used to detect motion?

- a) Temperature sensor
- b) Light sensor
- c) PIR (Passive Infrared) sensor
- d) Gas sensor

16. What does the ESP8266 Wi-Fi module allow an Arduino to do?

- a) Control servo motors
- b) Connect to the internet and send/receive data
- c) Read sensor data
- d) Interface with displays

17. Which of the following is a common use of the ESP8266 module in IoT?

- a) Temperature sensing
- b) Wireless communication with cloud services
- c) Lighting control
- d) Motion detection

18. Which protocol is commonly used with the ESP8266 for web communication?

- a) FTP
- b) MQTT
- c) HTTP
- d) SMTP

19. In an IoT system using the ESP8266, what is a common way to send sensor data to a web server?

- a) Using serial communication
- b) Sending data via Wi-Fi using HTTP POST requests
- c) Using infrared signals
- d) Transmitting data through Bluetooth

20. What does the ESP8266 module require for configuration?



- a) A Bluetooth module
- b) An internet connection for programming
- c) A mobile app for configuration
- d) A microcontroller (e.g., Arduino)

21. Which of the following is a benefit of cloud computing in IoT?

- a) Faster processing on local devices
- b) Storage and processing of large amounts of sensor data
- c) Limited access to sensor data
- d) Lack of internet connectivity

22. Answer: Which cloud service model provides virtual machines and storage, allowing users to manage operating systems and applications?

- a) SaaS
- b) IaaS
- c) PaaS
- d) DaaS

23. Which of the following is a popular cloud platform for IoT applications?

- a) Amazon Web Services (AWS)
- b) Google Earth
- c) Microsoft Word
- d) Adobe Photoshop

24. What does the ThingSpeak API allow IoT devices to do?

- a) Run machine learning algorithms
- b) Post sensor data to the cloud and visualize it
- c) Control local devices
- d) Connect to Bluetooth peripherals

25. Which of the following is a key feature of MQTT in IoT systems?

- a) It requires a large amount of bandwidth
- b) It uses a publisher-subscriber model for lightweight messaging
- c) It is not suitable for mobile devices
- d) It is not secure



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26. Which cloud service model is most appropriate for developers who want to focus only on application development without worrying about infrastructure management?

- a) PaaS
- b) IaaS
- c) SaaS
- d) DaaS

27. Which type of data is typically sent from IoT devices to cloud platforms?

- a) Video data
- b) Large binary files
- c) Sensor readings (e.g., temperature, humidity)
- d) Audio recordings
- **Answer**

28. Which of the following is a popular method for interfacing IoT devices with cloud services?

- a) Direct file transfer via USB
- b) Bluetooth communication
- c) Using a REST API or HTTP requests
- d) Serial communication over RS232

29. Answer What is a key advantage of using cloud platforms for IoT applications?

- a) Reduces hardware requirements on local devices
- b) Limits data storage to a local device
- c) Makes IoT devices more expensive
- d) Increases the need for physical infrastructure

30. Which of the following is a challenge when using cloud platforms for IoT?

- a) Increased local storage space
- b) Limited internet connectivity for devices
- c) Simplified hardware interfacing
- d) Decreased data processing speed



ANSWERS

- 1)c) High energy consumption
- 2)c) CoAP
- 3)a) Collects data from physical sensors
- 4)b) Smart thermostats
- 5)b) Data security and privacy issues
- 6)b) AVR microcontroller
- 7)a) Arduino IDE
- 8)a) setup()
- 9)a) To interact with external hardware components
- 10)b) Embedded C
- 11)b) LM35 sensor
- 12)a) Analog sensors output continuous signals, while digital sensors output discrete signals
- 13)b) To control high-voltage devices with low-voltage signals
- 14)a) Servo motor
- 15)c) PIR (Passive Infrared) sensor
- 16)b) Connect to the internet and send/receive data
- 17) b) Wireless communication with cloud services
- 18)c) HTTP
- 19)b) Sending data via Wi-Fi using HTTP POST requests
- 20)d) A microcontroller (e.g., Arduino)
- 21)b) Storage and processing of large amounts of sensor data
- 22)b) IaaS
- 23)a) Amazon Web Services (AWS)

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- 24)b) Post sensor data to the cloud and visualize it
- 25)b) It uses a publisher-subscriber model for lightweight messaging
- 26) a) PaaS
- 27) c) Sensor readings (e.g., temperature, humidity)
- 28) c) Using a REST API or HTTP requests
- 29)a) Reduces hardware requirements on local devices
- 30)b) Limited internet connectivity for devices



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MARK SHEET

| Sl.No | Admn.No | Name | MARKS(30) |
|-------|-------------|---------------------------|-----------|
| 1 | NCE22MC001 | ABDUL NAHAS K V | 29 |
| 2 | NCE22MC002 | ABHIJITH VINU | 28 |
| 3 | NCE22MC003 | ADITHYAN H | 25 |
| 4 | NCE22MC005 | AFSAL S | 27 |
| 5 | NCE22MC006 | ALAN BABY | 24 |
| 6 | NCE22MC007 | ARJUN KRISHNA S | 26 |
| 7 | NCE22MC008 | ASWIN KRISHNA. R | 25 |
| 8 | NCE22MC009 | ASWIN NAIR N | 23 |
| 9 | NCE22MC010 | ASWIN T J | 23 |
| 11 | NCE22MC011 | ATHUL KRISHNA T | 23 |
| 12 | NCE22MC012 | BASIL M PRASAD | 23 |
| 13 | NCE22MC013 | GOWRISANKAR DAS S | 25 |
| 14 | NCE22MC014 | KARTHIK SAJU | 29 |
| 15 | NCE22MC015 | MOHAMMED HABEEB HASSAN | 30 |
| 16 | NCE22MC016 | MOHAMMED NUFAS | 30 |
| 17 | NCE22MC017 | MUHAMMED FAYIS P H | 30 |
| 18 | NCE22MC018 | MUHAMMED MUHSIN C K | 27 |
| 19 | NCE22MC019 | MUHAMMED SHIFAD A | 26 |
| 20 | NCE22MC020 | SACHIDANAND M S | 28 |
| 21 | NCE22MC021 | SIDHARTH KOOZHAM PARAMBIL | 25 |
| 22 | LNCE22MC022 | NIRMALNATH K V | 23 |
| 24 | NCE21MC010 | ASWIN | 26 |



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IOT using ARDUINO

29
30

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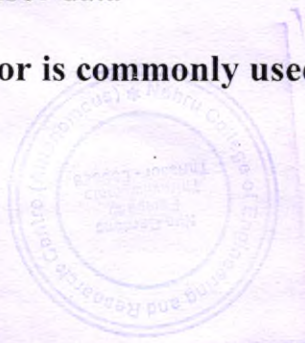
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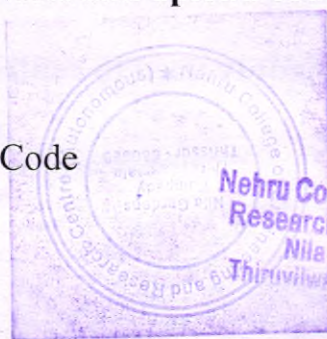
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IOT using ARDUINO

28
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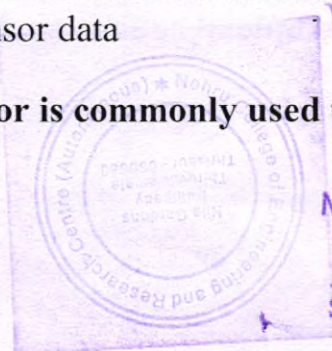
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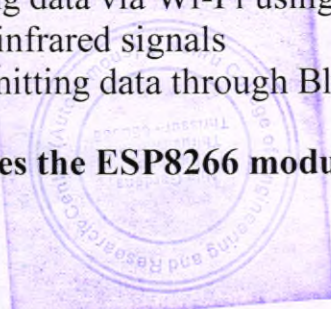
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Signature

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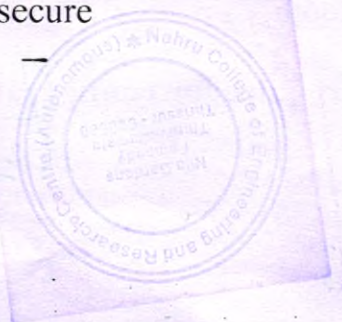
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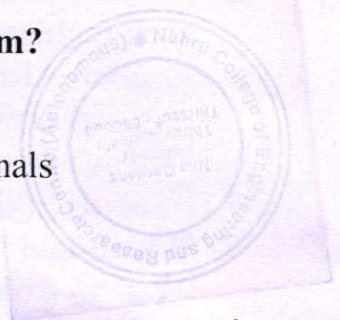
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- a) Control servo motors
- ✓ • b) Connect to the internet and send/receive data
- c) Read sensor data
- d) Interface with displays

17. Which of the following is a common use of the ESP8266 module in IoT?

- ✓ • a) Temperature sensing
- ✓ • b) Wireless communication with cloud services
- c) Lighting control
- d) Motion detection

18. Which protocol is commonly used with the ESP8266 for web communication?

- a) FTP
- b) MQTT
- c) HTTP
- ✓ • d) SMTP

19. In an IoT system using the ESP8266, what is a common way to send sensor data to a web server?

- a) Using serial communication
- ✓ • b) Sending data via Wi-Fi using HTTP POST requests
- c) Using infrared signals
- d) Transmitting data through Bluetooth

20. What does the ESP8266 module require for configuration?

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- a) A Bluetooth module
- ✓ b) An internet connection for programming
- ✓ c) A mobile app for configuration
- d) A microcontroller (e.g., Arduino)

21. Which of the following is a benefit of cloud computing in IoT?

- a) Faster processing on local devices
- ✓ b) Storage and processing of large amounts of sensor data
- c) Limited access to sensor data
- d) Lack of internet connectivity

22. Answer: Which cloud service model provides virtual machines and storage, allowing users to manage operating systems and applications?

- ✓ a) SaaS
- ✓ b) IaaS
- c) PaaS
- d) DaaS

23. Which of the following is a popular cloud platform for IoT applications?

- ✓ a) Amazon Web Services (AWS)
- b) Google Earth
- c) Microsoft Word
- d) Adobe Photoshop

24. What does the ThingSpeak API allow IoT devices to do?

- ✓ a) Run machine learning algorithms
- ✓ b) Post sensor data to the cloud and visualize it
- c) Control local devices
- d) Connect to Bluetooth peripherals

25. Which of the following is a key feature of MQTT in IoT systems?

- ✓ a) It requires a large amount of bandwidth
- ✓ b) It uses a publisher-subscriber model for lightweight messaging
- c) It is not suitable for mobile devices
- d) It is not secure



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CERTIFICATE OF COMPLETION

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conducted by the Department of Mechatronics Engineering, Nehru College of
Engineering and Research Centre, Pampady, Thrissur.

PROGRAM CO-ORDINATOR

HEAD OF DEPARTMENT



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CERTIFICATE OF COMPLETION

.....ABHIRAM VINU.....had successfully completed
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PROGRAM CO-ORDINATOR

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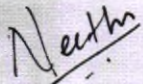
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Thiruvilwamala, Thrissur - 680 600

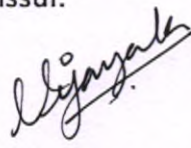




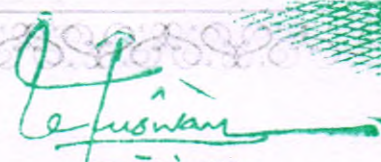
CERTIFICATE OF COMPLETION

..... AFSAL S had successfully completed
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CERTIFICATE OF COMPLETION

.....ALAN BABY.....had successfully completed
the Certified course " IOT USING ARDUINO " during 2023-24
conducted by the Department of Mechatronics Engineering, Nehru College of
Engineering and Research Centre, Pampady, Thrissur.

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Thiruvilwamala, Thrissur - 680588**

Nehru College of Engineering and Research Centre
MBA-2023-2025

| SL NO | REGISTER NO. | NAME OF THE STUDENT | MOOC COURSE | DATE OF EXAM | PASSED/FAILED |
|-------|--------------|-------------------------|---|--------------|---------------|
| 1 | NCE23MBA01 | AFEEFA M S | Air pollution and Control | 27-05-2024 | Passed |
| 2 | NCE23MBA02 | AL ANUDH N | Leadership and team effectiveness | 27-05-2024 | Passed |
| 3 | NCE23MBA03 | ANAS T S | Leadership and team effectiveness | 27-04-2024 | Passed |
| 4 | NCE23MBA04 | ANJANA P JAYAN | Leadership and team effectiveness | 27-04-2024 | PASSED |
| 5 | NCE23MBA05 | ANJANA S | Leadership and team effectiveness | 27-04-2024 | PASSED |
| 6 | NCE23MBA06 | ANKITHA HARI T | Leadership and team effectiveness | 27-04-2024 | PASSED |
| 7 | NCE23MBA07 | ANUGRAHA A | Leadership and team effectiveness | 27-04-2024 | PASSED |
| 8 | NCE23MBA08 | ANUPAMA K R | Leadership And Team effectiveness | 27-04-2024 | Passed |
| 9 | NCE23MBA09 | ANUSHA A | Leadership And Team effectiveness | 27-04-2024 | PASSED |
| 10 | NCE23MBA10 | APARNA C A | AI in marketing | 27-04-2024 | PASSED |
| 11 | NCE23MBA11 | ASWIN C BALAN | Leadership and team effectiveness | 27-04-2024 | Passed |
| 12 | NCE23MBA12 | BHAVANA REMESH | Leadership and team effectiveness | 27-04-2024 | Passed |
| 13 | NCE23MBA13 | DHANYA K | psychology of stress, health and well-being | 28-04-2024 | Passed |
| 14 | NCE23MBA14 | FARSEENA C K | psychology of stress, health and well-being | 28-04-2024 | Passed |
| 15 | NCE23MBA15 | FATHIMA ROSHNA | Education for sustainable development | 21-04-2024 | PASSED |
| 16 | NCE23MBA16 | FATHIMA SAJINA B | psychology of stress, health and well-being | 28-04-2024 | passed |
| 17 | NCE23MBA17 | GOKUL G S | leadership and team effectiveness | 27-04-2024 | Passed |
| 18 | NCE23MBA18 | GOPIKA M | Leadership and team effectiveness | 27-04-2024 | Passed |
| 19 | NCE23MBA19 | GOPIKA P | Leadership and team effectiveness | 27-04-2024 | Passed |
| 20 | NCE23MBA20 | GOURI M | Leadership and team effectiveness | 27-04-2024 | Passed |
| 21 | NCE23MBA21 | JEEVANLAL JOY | Leadership And Team effectiveness | 27-04-2024 | Passed |
| 22 | NCE23MBA22 | KALKKI PARVATHI R | Leadership And Team effectiveness | 27-04-2024 | PASSED |
| 23 | NCE23MBA23 | KIZHAKETHIL JOBY JOEL | Leadership and team effectiveness | 27-04-2024 | passed |
| 24 | NCE23MBA24 | MEGHA P G | Leadership and team effectiveness | 27-04-2024 | passed |
| 25 | NCE23MBA25 | MRIDUNA M | Leadership and team effectiveness | 27-04-2024 | passed |
| 26 | NCE23MBA26 | MUHSINA THASNEEM T | Leadership and team effectiveness | 27-04-2024 | passed |
| 27 | NCE23MBA27 | NAIR AADITYA ANANDKUMAR | Leadership and team effectiveness | 27-04-2024 | PASSED |
| 28 | NCE23MBA28 | NAIR SHREYA MOHANDASAN | Leadership And Team effectiveness | 27-04-2024 | Fail |
| 29 | NCE23MBA29 | NAKUL N KUTTY | Leadership and team effectiveness | 27-04-2024 | Passed |
| 30 | NCE23MBA30 | NANDANA P NAIR | Financial Statement Analysis And Reporting | 20-04-2024 | Passed |

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| | | | | | |
|----|------------|--------------------|--|------------|--------|
| 31 | NCE23MBA31 | NANDHANA M | Leadership for india inc:practical concepts and constructs | 20-04-2024 | Passed |
| 32 | NCE23MBA32 | NIMISHA U | Financial statement analysis and reporting | 20-04-2024 | Passed |
| 33 | NCE23MBA33 | NIMSHIYA N | Education for Sustainable Development | 21-04-2024 | PASSED |
| 34 | NCE23MBA34 | POOJA PRABHA P | Leader and team effectiveness | 27-04-2024 | passed |
| 35 | NCE23MBA35 | PRAJEESH KUMAR | Leadership and team effectiveness | 27-04-2024 | Passed |
| 36 | NCE23MBA36 | PRENEESH P U | Leadership and team effectiveness | 27-04-2024 | Fail |
| 37 | NCE23MBA37 | RAJANA P | Leadership and team effectiveness | 27-04-2024 | Passed |
| 38 | NCE23MBA38 | RANAFATHIMA T D | Leadership and team effectiveness | 27-04-2024 | passed |
| 39 | NCE23MBA39 | RISANA K | Leadership and team effectiveness | 27-04-2024 | passed |
| 40 | NCE23MBA40 | ROHINI S | AI in marketing | 27-04-2024 | Passed |
| 41 | NCE23MBA41 | SAJITH K | Leadership and team effectiveness | 27-04-2024 | Passed |
| 42 | NCE23MBA42 | SHENIYA M | Leadership and team effectiveness | 27-04-2024 | Failed |
| 43 | NCE23MBA43 | SHYAM PRAKASH | Leadership and team effectiveness | 27-04-2024 | Passed |
| 44 | NCE23MBA44 | SIBILFARHAN V A | Leadership and team effectiveness | 27-04-2024 | Passed |
| 45 | NCE23MBA45 | SILPA M J | Leadership and team effectiveness | 27-04-2024 | passed |
| 46 | NCE23MBA46 | SIYA S | Leadership And Team effectiveness | 27-04-2024 | Passed |
| 47 | NCE23MBA47 | SMRUTHI K | Leadership and Team Effectiveness | 27-04-2024 | Passed |
| 48 | NCE23MBA48 | SONA N | Financial statement analysis and reporting | 20-04-2025 | passed |
| 49 | NCE23MBA49 | SOORAJ S | Leadership and Team effectiveness | 27-04-2024 | Failed |
| 50 | NCE23MBA50 | SOWMYA M | Leadership and team effectiveness | 27-04-2024 | passed |
| 51 | NCE23MBA51 | SRADHA LAKSHMI P S | Leadership and team effectiveness | 27-04-2024 | Passed |
| 52 | NCE23MBA52 | SREEJITHA K | Financial statement analysis and reporting | 20-04-2024 | passed |
| 53 | NCE23MBA53 | SREELAKSHMI V S | financian statement analysis & reporting | 20-04-2024 | Passed |
| 54 | NCE23MBA54 | SREELEKHA P | Leadership and team effectiveness | 27-04-2024 | Passed |
| 55 | NCE23MBA55 | SREERAM K | Leadership And Team effectiveness | 27-04-2024 | PASSED |
| 56 | NCE23MBA56 | SURAJ S NAIR | modelling and analytics of supply chain management | 27-04-2024 | Passed |
| 57 | NCE23MBA57 | VAISAK BALAN NAIR | Leadership and team effectiveness | 27-04-2024 | Passed |
| 58 | NCE23MBA58 | VIDYA P V | Leadership and Team Effectiveness | 27-04-2024 | failed |
| 59 | NCE23MBA59 | VINITHA P V | Leadership and team effectiveness | 27-04-2024 | passed |
| 60 | NCE23MBA60 | V MAHESH MOHAN | Leadership and team effectiveness | 27-04-2024 | passed |

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NPTEL Online Certification

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This certificate is awarded to

NANDANA P NAIR

for successfully completing the course

Financial Statement Analysis and Reporting

with a consolidated score of **55** %

| | | | |
|--------------------|---------|----------------|---------|
| Online Assignments | 20.1/25 | Proctored Exam | 34.5/75 |
|--------------------|---------|----------------|---------|

Total number of candidates certified in this course: **849**

Prof. Kaushik Ghosh,
Professor (Chemistry)
Coordinator CEC

Jan-Apr 2024

(12 week course)

Prof. Ranjana Pathania,
Professor (BSBE)
Coordinator (NPTEL)



Indian Institute of Technology Roorkee



Roll No: NPTEL24MG22S364100035

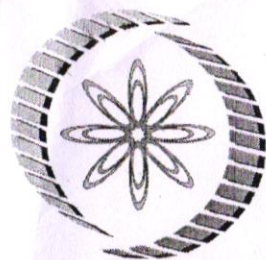
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No. of credits recommended: 3 or 4



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Elite

NPTEL Online Certification

(Funded by the MoE, Govt. of India)



This certificate is awarded to

ANUGRAHA A

for successfully completing the course

Leadership and Team Effectiveness

with a consolidated score of **61** %

| | | | |
|--------------------|----------|----------------|---------|
| Online Assignments | 23.44/25 | Proctored Exam | 37.5/75 |
|--------------------|----------|----------------|---------|

Total number of candidates certified in this course: **7482**

Prof. Kaushik Ghosh,
Professor (Chemistry)
Coordinator CEC



Jan-Apr 2024

(12 week course)

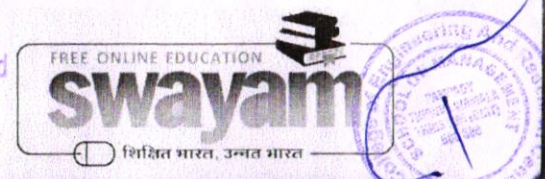
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Prof. Ranjana Pathania,
Professor (BSBE)
Coordinator (NPTEL)



Indian Institute of Technology Roorkee



Roll No: NPTEL24MG35S1064100181

To verify the certificate



No. of credits recommended: 3 or 4



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DEPARTMENT OF MCA- ACADEMIC YEAR 2023-24

Minutes of Meeting conducted on 27/10/2023

1. Principal's approval dt.06th – 17th November 2023 for Value Added courses
2. Topic of VA Course is fixed as Importance of Digital Marketing and E-Commerce
3. The syllabus may cover various sections related to Digital Marketing and E-Commerce activities
4. Class tutors must motivate the students to take the course seriously
5. Evaluation may be done through Quiz, Written Exams and Group activities
6. Certificates for successful students may be provided

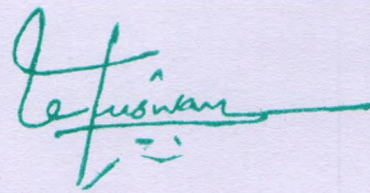
Coordinator – VA Courses-MCA

Faculty Attendees

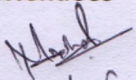
Dr.Sudheer.S.Marar 

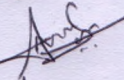
Pramod K 

Divya M 



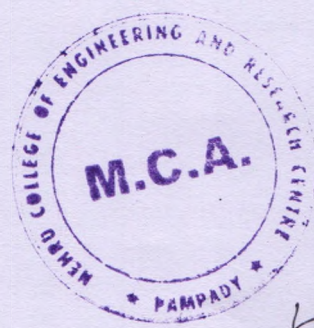
Student Attendees

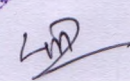
Mridula 

Arun Suresh 

Vismaya 

Unnimaya 







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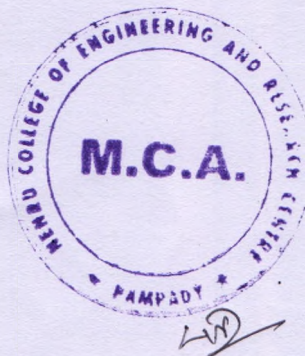
CIRCULAR

This is to inform you that the Department of MCA is conducting value added course on Importance of Digital Marketing and E-Commerce 06/11/23 to 17/11/23. Attendance is compulsory.

Pampady

30/10/23

HOD MCA





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DEPARTMENT OF MCA

PRESENTS

VALUE ADDED PROGRAM

**Importance of Digital
Marketing and E-Commerce**

DATE

06TH - 17TH NOVEMBER 2023

RESOURCE PERSON

SREEJITH K,

RESEARCH AND DEVELOPMENT ENGINEER AT LUMINAR TECHNOLAB

VENUE

KAPILA BLOCK, NCERC

For enquiries contact Coordinator Pramod K

☎ 9447068556





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DEPARTMENT OF MCA - ACADEMIC YEAR 2023-24

SYLLABUS IMPORTANCE OF DIGITAL MARKETING AND E-COMMERCE

06th – 17th November 2023

Unit 1: Introduction to Digital Marketing

Introduction to Digital Marketing: Evolution of digital Marketing, Traditional vs Digital Marketing, Digital Marketing Channels, Digital Marketing Plan, Digital Marketing Strategy, Digital Marketing Application and Benefits, Digital Marketing in India

Unit 2: Consumer and Digital Marketing

The Consumer and Digital Marketing: Consumer Behaviour on internet, Impact of Digital Technology on Consumer Behaviour, Attributes of online buying behaviour, Marketing Intelligence from user's online data understanding consumer demands, brand building on web.

Unit 3: Social Media Marketing

Social Media Marketing: Social Networking, Objectives of Social Media Strategy, Building social media strategy, Types of Social media marketing, Facebook marketing, LinkedIn marketing, Instagram marketing, YouTube Marketing, Twitter Marketing.

Unit 4: Intrusion Detection and Prevention

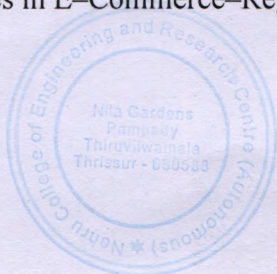
Introduction to E-commerce: Meaning and concept, E-commerce v/s Traditional Commerce, E-Business & E-Commerce History of E-Commerce – EDI – Importance, features & benefits of E-Commerce – Impacts, Challenges & Limitations of E-Commerce, Supply chain management & E-Commerce – E-Commerce infrastructure.

Unit 5: Marketing strategies & E – Commerce

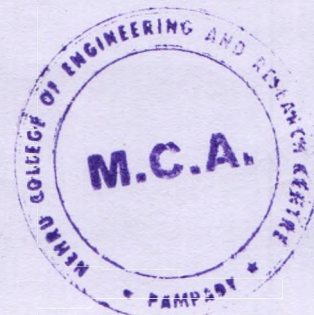
Website, components of website, Concept & Designing website for E-Commerce, Corporate Website, Portal, Search Engine – Internet. Advertising – Emergence of the internet as a competitive advertising media, Models of internet advertising, Weakness in Internet advertising, Mobile Commerce

Unit 6: Electronic payment system & Security

Electronic payment system, E-Banking-Concept, operations, online fund transfer-RTGS, ATM, etc, Security issues in E-Commerce-Regulatory framework of E-commerce.



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DEPARTMENT OF MCA - ACADEMIC YEAR 2023-24

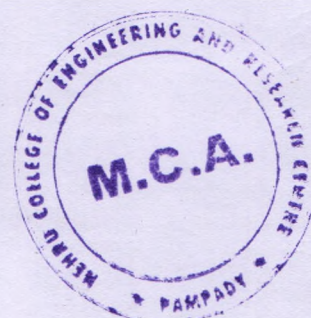
SCHEDULE OF IMPORTANCE OF DIGITAL MARKETING AND E-COMMERCE

06th – 17th NOVEMBER 2023

| No. | Date | Portions Covered |
|-----|------|-------------------------------------|
| 1 | 06 | Introduction to Digital Marketing |
| 2 | 07 | Digital Marketing Application |
| 3 | 08 | Digital Marketing in India |
| 4 | 09 | Consumer and Digital Marketing |
| 5 | 10 | Marketing Intelligence |
| 6 | 13 | Introduction to E-Commerce |
| 7 | 14 | Business Models in E-Commerce |
| 8 | 15 | Electronic Payment System |
| 9 | 16 | Marketing strategies & E – Commerce |
| 10 | 17 | Security issues in E-Commerce |



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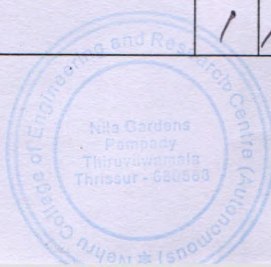
DEPARTMENT OF MCA - ACADEMIC YEAR 23-24

ATTENDANCE FOR ADD-ON PROGRAM

"IMPORTANCE OF DIGITAL MARKETING AND E-COMMERCE"

06th – 17th Nov 2023

| NO. | NAME | 06 | 07 | 08 | 09 | 10 | 13 | 14 | 15 | 16 | 17 |
|-----|---------------------|----|----|----|----|----|----|----|----|----|----|
| 1 | ABHISHEK C V | / | / | / | / | / | / | / | / | / | / |
| 2 | ABIN P S | / | / | / | / | / | / | / | / | / | / |
| 3 | ABIN R NAIR | / | / | / | / | / | / | / | / | / | / |
| 4 | ADHRIJA T S | / | / | / | / | / | / | / | / | / | / |
| 5 | AISWARYA G | / | / | / | / | / | / | / | / | / | / |
| 6 | AJMAL V M | / | / | / | / | / | / | / | / | / | / |
| 7 | ALTHAF N | / | / | / | / | / | / | / | / | / | / |
| 8 | AMANYURAG S | / | / | / | / | / | / | / | / | / | / |
| 9 | A M MOHAMMED FARHAN | / | / | / | / | / | / | / | / | / | / |
| 10 | ANJANA V S | / | / | / | / | / | / | / | / | / | / |
| 11 | ANJIMA A M | / | / | / | / | / | / | / | / | / | / |
| 12 | ANJU R | / | / | / | / | / | / | / | / | / | / |
| 13 | ANOOP KRISHNAN P | / | / | / | / | / | / | / | / | / | / |
| 14 | ANUPAMA N | / | / | / | / | / | / | / | / | / | / |
| 15 | ANURAG N K | / | / | / | / | / | / | / | / | / | / |
| 16 | APARNA DAS S | / | / | / | / | / | / | / | / | / | / |
| 17 | ARIFA O K | / | / | / | / | / | / | / | / | / | / |
| 18 | ARJUN C | / | / | / | / | / | / | / | / | / | / |
| 19 | ARUN SURESH | / | / | / | / | / | / | / | / | / | / |
| 20 | ASHISH T A | / | / | / | / | / | / | / | / | / | / |
| 21 | ASHLIN JAMES | / | / | / | / | / | / | / | / | / | / |
| 22 | ASNA A T | / | / | / | / | / | / | / | / | / | / |
| 23 | ASWANI M P | / | / | / | / | / | / | / | / | / | / |
| 24 | ASWIN SHIBU | / | / | / | / | / | / | / | / | / | / |
| 25 | BHARATH B | / | / | / | / | / | / | / | / | / | / |
| 26 | BHAVANA K N | / | / | / | / | / | / | / | / | / | / |
| 27 | DEEPAK D | / | / | / | / | / | / | / | / | / | / |



Signature

Signature

| | | | | | | | | | | | |
|----|----------------------|---|---|---|---|---|---|---|---|---|---|
| 28 | HIDAYATHUL MUFEEDA S | / | / | / | / | / | / | / | / | / | / |
| 29 | IFRA NASRIN A | / | / | / | / | / | / | / | / | / | / |
| 30 | JISHNU S | / | / | / | / | / | / | / | / | / | / |
| 31 | K AKASH | / | / | / | / | / | / | / | / | / | / |
| 32 | KARTHIKA K S | / | / | / | / | / | / | / | / | / | / |
| 33 | MALAVIKA M | / | / | / | / | / | / | / | / | / | / |
| 34 | MANEESHA C M | / | / | / | / | / | / | / | / | / | / |
| 35 | MOHAMMED ANAS P | / | / | / | / | / | / | / | / | / | / |
| 36 | MOHAMMED SADHIK M S | / | / | / | / | / | / | / | / | / | / |
| 37 | MRIDULA M | / | / | / | / | / | / | / | / | / | / |
| 38 | NANDANA C | / | / | / | / | / | / | / | / | / | / |
| 39 | NASRIN M | / | / | / | / | / | / | / | / | / | / |
| 40 | NIHANA SIDHIK | / | / | / | / | / | / | / | / | / | / |
| 41 | NIMYA S | / | / | / | / | / | / | / | / | / | / |
| 42 | PRANAV SUNNY | / | / | / | / | / | / | / | / | / | / |
| 43 | RAMSEENA CP | / | / | / | / | / | / | / | / | / | / |
| 44 | REVATHI K R | / | / | / | / | / | / | / | / | / | / |
| 45 | R H ADITHYA MOL | / | / | / | / | / | / | / | / | / | / |
| 46 | SAFLA M | / | / | / | / | / | / | / | / | / | / |
| 47 | SAJLA P K | / | / | / | / | / | / | / | / | / | / |
| 48 | SANDRA P G | / | / | / | / | / | / | / | / | / | / |
| 49 | SANJAY A B | / | / | / | / | / | / | / | / | / | / |
| 50 | SARANATH U | / | / | / | / | / | / | / | / | / | / |
| 51 | SHABINA V | / | / | / | / | / | / | / | / | / | / |
| 52 | SHAFEENA K I | / | / | / | / | / | / | / | / | / | / |
| 53 | SHYAMSANKAR T | / | / | / | / | / | / | / | / | / | / |
| 54 | SOBHITHA S P | / | / | / | / | / | / | / | / | / | / |
| 55 | SREEDHANYA T S | / | / | / | / | / | / | / | / | / | / |
| 56 | SREEMA R | / | / | / | / | / | / | / | / | / | / |
| 57 | SUJINA E S | / | / | / | / | / | / | / | / | / | / |
| 58 | UNNI MAYA V | / | / | / | / | / | / | / | / | / | / |
| 59 | VISMAYA S | / | / | / | / | / | / | / | / | / | / |
| 60 | V KEERTHI | / | / | / | / | / | / | / | / | / | / |



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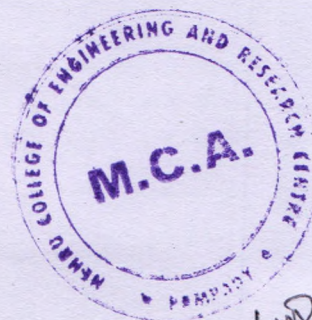
ACADEMIC YEAR 2023-24

IMPORTANCE OF DIGITAL MARKETING AND E-COMMERCE QUESTION PAPER

1. _____, social media, mobile apps, and other digital channels are all examples of digital marketing used by companies and companies.
 - A. Search Engines
 - B. Websites
 - C. Emails
 - D. All of the above
2. _____ are used in digital marketing.
 - A. Electronic devices
 - B. Internet
 - C. Both A and B
 - D. None of the above
3. _____ is/are the main component(s) of digital marketing.
 - A. SEO
 - B. SMO
 - C. SEM
 - D. All of the above
4. What is the full form of SEO?
 - A. Search Engine Optimal
 - B. Social Engine Optimization
 - C. Search Engine Optimization
 - D. Social Engine Optimal
5. What is the full form of SEM?
 - A. Social Engine Marketing
 - B. Search Engine Marketing
 - C. Search Engine Management
 - D. Social Engine Management
6. What is the full form of SMO?
 - A. Social Media Optimal
 - B. Search Media Optimal
 - C. Search Media Optimization
 - D. Social Media Optimization

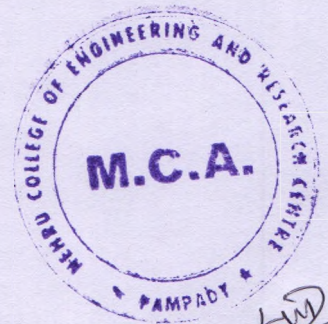


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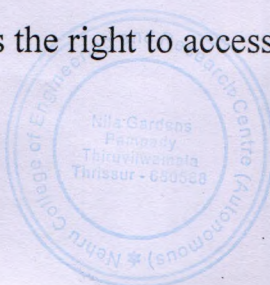


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7. The important On-Page SEO factor(s) is/are -
- A. Meta Tags
 - B. Sitemap
 - C. Canonical Tag
 - D. All of the above
8. Which of the following describes e-commerce?
- A. Doing business electronically
 - B. Doing business
 - C. Sale of goods
 - D. All of the above
9. The best products to sell in B2C e-commerce are:
- A. Small products
 - B. Digital products
 - C. Specialty products
 - D. Fresh products
10. Digital products are best suited for B2C e-commerce because they:
- A. Are commodity like products
 - B. Can be mass-customized and personalized
 - C. Can be delivered at the time of purchase
 - D. All of the above
11. How the transactions occur in e-commerce?
- A. Using e-medias
 - B. Using computers only
 - C. Using mobile phones only
 - D. None of the above
12. Which of the following refers to creating products tailored to individual customers?
- A. customization
 - B. aggregation
 - C. Direct materials
 - D. Reverse auction
13. Which factor determines who has the right to access different types of IT systems and information?
- A. Availability



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- B. Accessibility
- C. Reliability
- D. Scalability

14. Which is not a function of ERP?

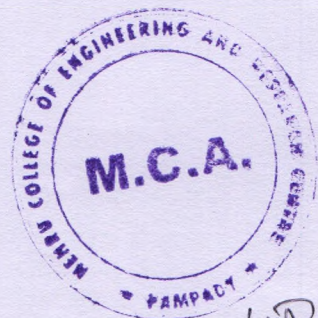
- A. Warehousing
- B. sales
- C. scheduling
- D. None of the above

15. In mobile marketing, the full form of LBS is _____.

- A. Location-based service
- B. List-based service
- C. Lead-based service
- D. None of the above



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ACADEMIC YEAR 23-24

IMPORTANCE OF DIGITAL MARKETING AND E-COMMERCE

1. ____, social media, mobile apps, and other digital channels are all examples of digital marketing used by companies and companies. D

- A. Search Engines
- B. Websites
- C. Emails
- ☒ D. All of the above

2. ____ are used in digital marketing. C

- A. Electronic devices
- B. Internet
- ☒ C. Both A and B
- D. None of the above

3. ____ is/are the main component(s) of digital marketing. D

- A. SEO
- B. SMO
- C. SEM
- ☒ D. All of the above

4. What is the full form of SEO? C

- A. Search Engine Optimal
- B. Social Engine Optimization
- ☒ C. Search Engine Optimization
- D. Social Engine Optimal

5. What is the full form of SEM? B

- A. Social Engine Marketing
- ☒ B. Search Engine Marketing
- C. Search Engine Management
- D. Social Engine Management

6. What is the full form of SMO? D

- A. Social Media Optimal
- B. Search Media Optimal
- C. Search Media Optimization
- ☒ D. Social Media Optimization

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15

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☒ D. Social Media Optimization

7. The important On-Page SEO factor(s) is/are - C

- A. Meta Tags
- B. Sitemap
- ☒ C. Canonical Tag
- D. All of the above

8. Which of the following describes e-commerce? C

- A. Doing business electronically
- B. Doing business
- ☒ C. Sale of goods
- D. All of the above

9. The best products to sell in B2C e-commerce are: B

- A. Small products
- ☒ B. Digital products
- C. Specialty products
- D. Fresh products

10. Digital products are best suited for B2C e-commerce because they: D

- A. Are commodity like products
- B. Can be mass-customized and personalized
- C. Can be delivered at the time of purchase
- ☒ D. All of the above

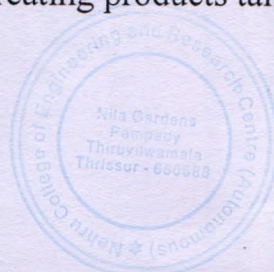
11. How the transactions occur in e-commerce? A

- ☒ A. Using e-medias
- B. Using computers only
- C. Using mobile phones only
- D. None of the above

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12. Which of the following refers to creating products tailored to individual customers? A

- ☒ A. customization
- B. aggregation
- C. Direct materials
- D. Reverse auction



13. Which factor determines who has the right to access different types of IT systems and information? B

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- ☒ A. Availability
- ☒ B. Accessibility
- ☒ C. Reliability
- ☒ D. Scalability

14. Which is not a function of ERP? D

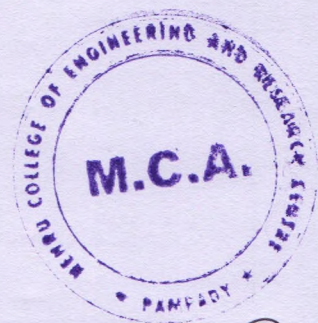
- ☒ A. Warehousing
- ☒ B. sales
- ☒ C. scheduling
- ☒ D. None of the above

15. In mobile marketing, the full form of LBS is A.

- ☒ A. Location-based service
- ☒ B. List-based service
- ☒ C. Lead-based service
- ☒ D. None of the above



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ACADEMIC YEAR 23-24

IMPORTANCE OF DIGITAL MARKETING AND E-COMMERCE ANSWER KEY

1. ____, social media, mobile apps, and other digital channels are all examples of digital marketing used by companies and companies.

- A. Search Engines
- B. Websites
- C. Emails
- D. All of the above

Answer: D) All of the above

2. ____ are used in digital marketing.

- A. Electronic devices
- B. Internet
- C. Both A and B
- D. None of the above

Answer: C) Both A and B

3. ____ is/are the main component(s) of digital marketing.

- A. SEO
- B. SMO
- C. SEM
- D. All of the above

Answer: D) All of the above

4. What is the full form of SEO?

- A. Search Engine Optimal
- B. Social Engine Optimization
- C. Search Engine Optimization
- D. Social Engine Optimal

Answer: C) Search Engine Optimization

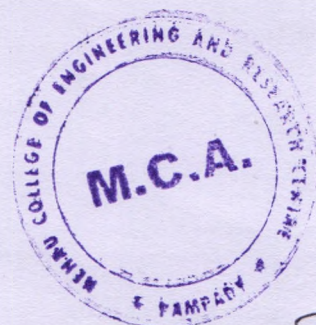
5. What is the full form of SEM?

- A. Social Engine Marketing
- B. Search Engine Marketing
- C. Search Engine Management
- D. Social Engine Management

Answer: B) Search Engine Marketing



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6. What is the full form of SMO?

- A. Social Media Optimal
- B. Search Media Optimal
- C. Search Media Optimization
- D. Social Media Optimization

Answer: D) Social Media Optimization

7. The important On-Page SEO factor(s) is/are -

- A. Meta Tags
- B. Sitemap
- C. Canonical Tag
- D. All of the above

Answer: D) All of the above

8. Which of the following describes e-commerce?

- A. Doing business electronically
- B. Doing business
- C. Sale of goods
- D. All of the above

Answer: A

9. The best products to sell in B2C e-commerce are:

- A. Small products
- B. Digital products
- C. Specialty products
- D. Fresh products

Answer: B

10. Digital products are best suited for B2C e-commerce because they:

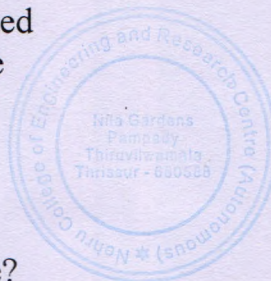
- A. Are commodity like products
- B. Can be mass-customized and personalized
- C. Can be delivered at the time of purchase
- D. All of the above

Answer: D

11. How the transactions occur in e-commerce?

- A. Using e-medias
- B. Using computers only
- C. Using mobile phones only
- D. None of the above

Answer: A



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12. Which of the following refers to creating products tailored to individual customers?

- A. customization
- B. aggregation
- C. Direct materials
- D. Reverse auction

Answer: A

13. Which factor determines who has the right to access different types of IT systems and information?

- A. Availability
- B. Accessibility
- C. Reliability
- D. Scalability

Answer: B

14. Which is not a function of ERP?

- A. Warehousing
- B. sales
- C. scheduling
- D. None of the above

Answer: D

15. In mobile marketing, the full form of LBS is _____.

- A. Location-based service
- B. List-based service
- C. Lead-based service
- D. None of the above

Answer: A Location-based service



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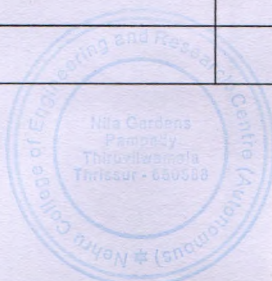
DEPARTMENT OF MCA - ACADEMIC YEAR 23-24

MARK LIST OF ADD-ON PROGRAM

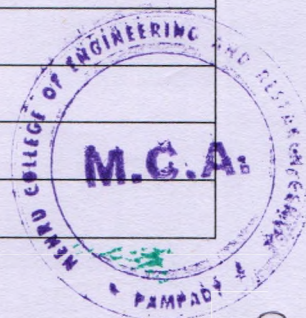
"IMPORTANCE OF DIGITAL MARKETING AND E-COMMERCE"

06th - 17th Nov 2023

| NO. | NAME | MARK |
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| 2 | ABIN P S | 14 |
| 3 | ABIN R NAIR | 13 |
| 4 | ADHRIJA T S | 13 |
| 5 | AISWARYA G | 14 |
| 6 | AJMAL V M | 14 |
| 7 | ALTHAF N | 13 |
| 8 | AMANYURAG S | 12 |
| 9 | A M MOHAMMED FARHAN | 14 |
| 10 | ANJANA V S | 13 |
| 11 | ANJIMA A M | 13 |
| 12 | ANJU R | 12 |
| 13 | ANOOP KRISHNAN P | 12 |
| 14 | ANUPAMA N | 13 |
| 15 | ANURAG N K | 12 |
| 16 | APARNA DAS S | 12 |
| 17 | ARIFA O K | 12 |
| 18 | ARJUN C | 14 |
| 19 | ARUN SURESH | 13 |
| 20 | ASHISH T A | 13 |
| 21 | ASHLIN JAMES | 12 |
| 22 | ASNA A T | 12 |
| 23 | ASWANI M P | 12 |
| 24 | ASWIN SHIBU | 12 |
| 25 | BHARATH B | 13 |
| 26 | BHAVANA K N | 14 |
| 27 | DEEPAK D | 14 |

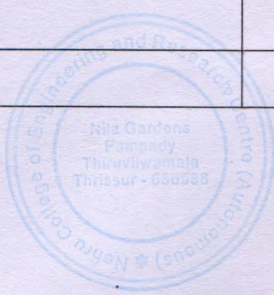


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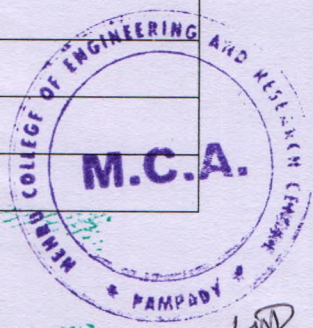


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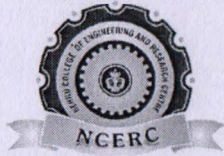
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| 33 | MALAVIKA M | 14 |
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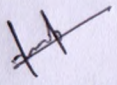
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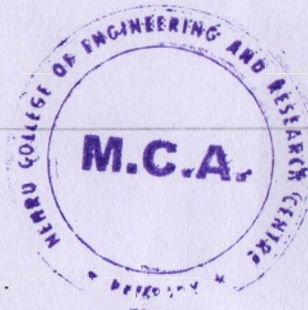
of

NCERC

college has actively participated

*in a value added program " Importance of Digital Marketing and E-Commerce ". Upon
completion of theoretical and practical modules and successfully completed the assessment
test this document of participation is presented.*


Course Co-ordinator




HOD-MCA Department

