| 富山高等専門学校 | | | 開講年度 平成29年度 (2 | 2017年度) | 授業科目 | シミュレーション工学特論 | | |
|--|-------------|---|---|--|--|--|--|--|
| 科目基础 | 楚情報 | | | | | | | |
| 科目番号 0096 | | | | 科目区分 | 専門 / 選 | 択 | | |
| 授業形態 | | 授業 | | 単位の種別と単 | 位数 学修単位: | 2 | | |
| 開設学科エンデザイ | | | | 対象学年 | 専1 | | | |
| 開設期前期 | | | | 週時間数 | 2 | | | |
| 教科書/教材 | | | | | | | | |
| 担当教員 | | 石黒 農 | | | | | | |
| | Ŧ | | | | | | | |
| 到達目標 | | | | | | | | |
| the comp learn two differenti | outer progr | am. And the nal heat tran ns, and conve | sfer analysis as a solution of parti | ices method as a al differential eq | a concrete nume uation. It is aime | rical analysis method. And you will | | |
| ルーブリ | ノック | | 1 | | | | | |
| | | | Ideal Level of Achievement (Very Good) | Standard Level of Achievement (Good) | | Unacceptable Level of Achievement (Fail) | | |
| Evaluation 1: It is evaluated that you can derive the some partial differential equations or not. | | | You can derive some differentia equations. | You can derive only fundamental differential equations. | | You can not derive fundamental differential equations. | | |
| Evaluation 2:It is evaluated that you can express partial differential equations using a difference method or not. | | | You can expand a few kinds of type partial differential equations using difference method. | You can expand fundamental partial differential equations using difference method. | | You can not expand fundamental partial differential equations using difference method. | | |
| Evaluation 3:It is evaluated that you can express appropriate answer about boundary condition or not. | | | | You can explai boundary conc | | You can not explain theory of boundary condition. | | |
| Evaluation 4: It is evaluated that you can implement difference equations into computer program or not. | | | You can solve some partial differential problems. | You can solve partial differen | fundamental tial problems. | You can not solve fundamental partial differential problems. | | |
| Evaluation 5:It is evaluated that you can express visually some partial differential equations answer using computer graphics, or not. | | | You can express visually applied partial differential equations answer using computer graphics. | You can express visually fundamental partial differential equations answer using computer graphics. | | You can not express visually fundamental partial differential equations answer using computer graphics. | | |
| | | 目との関係 | <u>s</u> | ł | | | | |
| | | | | | | | | |
| 概要 programmi difference r heat transfe | | | ture, you will learn outline of some numerical method as base of the implementation of computer ing for more good understanding the simulation engineering. And then, you will learn finite method as concrete of the numerical simulation. Finally, you will implement the two-dimensional fer analysis as a partial differential equation problem into computer programming. Inct will be performed with both of lecture and computer program practice. The lecture will be | | | | | |
| berformed | | | based on the Japanese textbook. You will become who be able to construct program of the partial equation about some simulation of physic phenomena. The kind of the computer program s not limited in the lecture, but you must be able to show simulation result by computer graphics. | | | | | |
| 注意点 | | | | | | | | |
| 授業計画 | ۵. | ł | | | | | | |
| | - | 週 打 | 受業内容 | | 週ごとの到達目標 | E | | |
| 前期 | 1stQ | 1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (| Drientation of this lecture. Explana imulation and how to formulate th | tion of some he model. | We will understand using simulation why we need to learn in live. | | | |
| | | 2週 c | planation of how to solve or derive the partial ferential equations using separation of variable thod. Part one. | | | and how to derive the partial ation using mathematical analysis. | | |
| | | E 3週 c | Explanation of how to solve or der lifferential equations using separa nethod. Part two. | ive the partial tion of variable | You will understand how to derive the partial differential equation using mathematical analysis. | | | |
| | | 4週 E | explanation of how to convert the equation into the finite differences | differential method. | You will understand how to convert the differential equation into the finite differences method. | | | |
| | | 5週 c | Explanation of how to convert the lifferential equation into the finite nethod. | ellipse type differences | You will understand how to convert the ellipse type differential equation into the finite differences method. And then, you will understand the Gauss-seidel method, the SOR method and how to construct difference equation systems. | | | |
| | | 6週 c | xplanation of how to convert the ifferential equation into the finite nethod. Part two. | ellipse type differences | You will understand how to convert the ellipse type differential equation into the finite differences method. And then, you will understand the Gauss-seidel method, the SOR method and how to construct difference equation systems. | | | |
| | | 7週 t | xplanation about how to impleme ype lifferential equation into computer | | You will understand how to implement the ellipse type differential equation into computer program. | | | |

| 8週 | Intermediate exa | | | Examination will | he nerformed f | or ovaluating | |
|-------------|--|---|---|---|--|---|--|
| | | mination. | | Examination will be performed for evaluating intelligibility. The test will be based on the review of the lecture note. | | | |
| 9週 | Explanation of intermediate examination's answer. And explanation of how to convert the parabola type differential equation into finite differences method. | | | You will understand how to convert the parabola type differential equation into finite differences method, and explicit method on computer program, and Crank-Nicholson implicit scheme. | | | |
| 10週 | differential equat | ion into finite diffe | parabola type erences | You will understand how to convert the parabola type differential equation into finite differences method, and explicit method on computer program, and Crank-Nicholson implicit scheme. Part two. | | | |
| 11週 | differential equat | ion into finite diffe | | You will understand how to convert the parabola type differential equation into finite differences method, and explicit method on computer program, and Crank-Nicholson implicit scheme. Part three. | | | |
| 12週 | dimensional para | You will understand how to convert the two- dimensional parabola type differential equation into finite differences method, and explicit method on computer program, and Crank-Nicholson implicit scheme. | | | | | |
| 13週 | Explanation of how to convert the two- dimensional parabola type differential equation into finite differences method. Part two. | | | You will understand how to convert the two- dimensional parabola type differential equation into finite differences method, and explicit method on computer program, and Crank-Nicholson implicit scheme. Part two. | | | |
| 14週 | Explanation of how to implement the two- dimensional parabola type differential equation into computer program. | | | You will understand how to implement the two- dimensional parabola type differential equation into computer program. | | | |
| 15週 | dimensional para | bola type differen | he two- tial equation | You will understand how to implement the two- dimensional parabola type differential equation into computer program. Part two. | | | |
| 16週 | Final examination | 1. | | Examination will be performed for evaluating intelligibility. The test will be based on the review of the lecture note. | | | |
| リキュラムの | の学習内容と到達 | 目標 | | | | | |
| | | | | | | | |
| | | 1 | - | | | | |
| Examination | Presentation | Mutual Evaluations between students | Behavior | Portfolio | Report | 合計 | |
| 80 | 0 | 0 | 0 | 0 | 20 | 100 | |
| 40 | 0 | 0 | 0 | 0 | 0 | 40 | |
| 40 | 0 | 0 | 0 | 0 | 20 | 60 | |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 10週 11週 12週 13週 14週 15週 16週 リキュラムの 分野 Examination 80 40 | 9週 parabola type diff differences method 10週 Explanation of ho differential equation method. Part two 11週 Explanation of ho differential equation method. Part three 12週 Explanation of ho dimensional para into finite different 13週 Explanation of ho dimensional para into finite different 14週 Explanation of ho dimensional para into computer provent 15週 Explanation of ho dimensional para into computer provent 16週 Final examination U==================================== | 9週 parabola type differential equation differences method. 10週 Explanation of how to convert the differential equation into finite differential equation for how to convert the dimensional parabola type differentiate dimensional parabola type differentiate dimensional parabola type differentiate dimensional parabola type differentiate computer program. 13週 Explanation of how to convert the dimensional parabola type differentiate dimensional parabola type differentiate computer program. 14週 Explanation of how to implement to dimensional parabola type differentiate computer program. 15週 Explanation of how to implement to dimensional parabola type differentiate computer program. 16週 Final examination. リキュラムの学習内容と到達目標 分野 学習内容 客 0 40 0 0 0 | 9週 parabola type differential equation into finite differences method. 10週 Explanation of how to convert the parabola type differential equation into finite differences method. Part two. 11週 Explanation of how to convert the parabola type differential equation into finite differences method. Part three. 12週 Explanation of how to convert the two-dimensional parabola type differential equation into finite differences method. 13週 Explanation of how to convert the two-dimensional parabola type differential equation into finite differences method. 13週 Explanation of how to convert the two-dimensional parabola type differential equation into finite differences method. Part two. 14週 Explanation of how to implement the two-dimensional parabola type differential equation into computer program. 15週 Explanation of how to implement the two-dimensional parabola type differential equation into computer program. 16週 Final examination. リキュラムの学習内容と到達目標 女野 学習内容 学習内容の到達目標 Examination Presentation Mutual Evaluations between students Behavior 80 0 0 0 0 0 40 0 0 0 0 0 | 99回 parabola type differential equation into finite differences method. method, and exp program, and Ci You will underst type differential method, Part two. 10週 Explanation of how to convert the parabola type differential equation into finite differences method. Part two. You will underst type differential method, and exp program, and Ci Part two. 11週 Explanation of how to convert the parabola type differential equation into finite differences method. Part three. You will underst type differential equation of how to convert the two- dimensional parabola type differential equation into finite differences method. You will underst dimensional par- into finite differences method. 13週 Explanation of how to convert the two- dimensional parabola type differential equation into finite differences method. Part two. You will underst dimensional para into finite differences on computer pro implicit scheme. 14週 Explanation of how to implement the two- dimensional parabola type differential equation into computer program. Part two. You will underst dimensional parabola type differential equation into computer program. Part two. 15週 Final examination. You will underst dimensional parabola type differential equation into computer program. Part two. 16週 Final examination. Examination differential into computer program. Part two. 15週 Final examination. Portfolio 20 0 0 0 | 学短 parabola type differential equation into finite differences method. method, and explicit method on program, and Crank-Nicholson i You will understand how to convert the parabola type differential equation into finite differences method. Part two. 11週 Explanation of how to convert the parabola type differential equation into finite differences method. Part two. You will understand how to convert type differential equation into finite differences method. Part three. 11週 Explanation of how to convert the parabola type differential equation into finite differences method. Part three. You will understand how to convert type differential equation into finite differences method, and explicit method on program, and Crank-Nicholson i Part three. 12週 Explanation of how to convert the two- dimensional parabola type differential equation into finite differences method. You will understand how to comvert method, and explicit method on program, and Crank-Nicholson i Part three. 13週 Explanation of how to convert the two- dimensional parabola type differential equation into finite differences method. Part two. You will understand how to comp dimensional parabola type differential equation into computer program. 14週 Explanation of how to implement the two- dimensional parabola type differential equation into computer program. Part two. You will understand how to impl dimensional parabola type differential equation into computer program. 15週 Final examination. You will understand how to impl dimensional parabola type differential equation into computer pro | |