NIRMALA COLLEGE OF PHARMACY MUVATTUPUZHA

Muvattupuzha P.O., Ernakulam Dist., Kerala – 686661

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FIRST CYCLE NAAC ACCREDITATION 2023

CRITERION 1

CURRICULAR ASPECTS

1.2.2 Percentage of students enrolled in Certificate/ Add-on/Value added programs and also completed online MOOC programs like SWAYAM, NPTEL etc. as against the total number of students during the last five years

Submitted to

THE NATIONAL ASSESSMENT AND ACCREDITATION COUNCIL

1.2.2. Number of students enrolled in subject related Certificate/ Add-on/Value added programs and also completed online MOOC programs like SWAYAM, NPTEL etc. year wise during last five years

REPORT ON THE ADD-ON COURSE OFFERED BY THE INSTITUTION DURING THE ACADEMIC YEAR 2019-2020

S. No	Courses	View Page
1.	Quality By Design Setting of Qualitative Targets	View Page
2.	Basic Course in Yoga and Meditation	View Page
3.	Sigma Plot: A Tool for Statistical Analysis	View Page

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🌐 www.nirmalacp.org

Managed by Nirmala College Society (Reg.-No.ER 928/2001), Diocese of Kothamangalam

Affiliated to Kerala University of Health Sciences, Thrissur Approved by Government of Kerala & Pharmacy Council of India, New Delhi . Certified by ISO 9001:2015. Accredited by IAO & NBA (UG Pharmacy).

NBA
NATIONAL BOARD OF ACCREDITATION

NIRMALA COLLEGE OF PHARMACY, MUVATTUPUZHA
Affiliated to Kerala university of Health sciences Thrissur
Approved by Government of Kerala, AICTE and PCI, New Delhi

Report On add on course Submitted to Head of the Department

AY 2019-2020

Name of add on course: **Quality By design-Setting qualitative targets**

Program to which Courses Offered:

M Pharm	2018-2020 Batch
	2019-2021 Batch
B Pharm	2017-2021 Batch

Number of students Enrolled: 31

M Pharm	13 Students
B Pharm	18 Students

Number of students Completed: 31
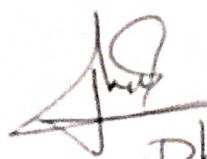
Date of starting the course: 1/08/19

Date of completion: 25/10/19

Number of Hours Class conducted: 35hrs

Assessment Method carried Out: Assignment Report

Course Coordinator: Dhanish Joseph

NIRMALA COLLEGE OF PHARMACY, MUVATTUPUZHA
Affiliated to Kerala university of Health sciences Thrissur
Approved by Government of Kerala, AICTE and PCI, New Delhi

Submitted by:

Name: Aimy Kuriakose

Roll number: 3

Register number: 170091278

VII Semester B Pharm

November 2019

Module Objective:

At the end of this module I will understand
   A. Current application of computers in drug development.
   B. Design and develop highly sustainable, reproducible and high quality drug products with reduced product variability and defects.
   C. The various factors that contribute towards development of a drug delivery system.
   D. Formulate and perform a analysis of drug delivery system using statistical software.

Module Outcome:

At the end of this module I gained knowledge about
   A. The current application of computers in drug development
   B. The design and develop highly sustainable, reproducible and high quality drug products with reduced product variability and defects.
   C. Knowledge about the various factors that contribute towards development of a drug delivery system.
   D. To formulate and perform a analysis of drug delivery system using statistical software.

COMPUTER AIDED DRUG DEVELOPMENT

SUMMARY

DESIGN EXPERT SOFTWARE

Design-Expert is a statistical software package from stat-ease Inc. that is specifically dedicated to performing design of experiments (doe). design – expert offers comparative tests, screening, characterization, optimization, robust parameter design, mixture designs and combined designs. statistical significance of these factors is established with analysis of variance (anova). graphical tools help identify the impact of each factor on the desired outcomes and reveal abnormalities in the data. the optimization feature can be used to calculate the optimum operating parameters for a process.

ASSIGNMENT

QUESTION

Design the experiments to enhance the solubility of a poorly soluble drug using the surfactants like tween 80 and Sodium Lauryl Sulfate. Identify the combination of surfactant required to get the maximum solubility. (above 75%) (Table 2.1)

	+1	-1
Tween 80	3 MG	1 MG
SLS	5 MG	1 MG

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REPORT

1. **DOE (Table 2.2)**

Std	Run	Factor 1 A:Tween 80 mg	Factor 2 B:SLS mg	Response 1 Solubility %
1	11	1	1	62
2	8	1	1	58
3	9	1	1	64
4	1	3	1	74
5	4	3	1	72
6	3	3	1	69
7	10	1	5	76
8	5	1	5	82
9	6	1	5	81
10	12	3	5	88
11	2	3	5	92
12	7	3	5	94

2. **ANALYSIS**

ANOVA for selected factorial model

Response 1: Solubility (Table 2.3)

Source	Sum of Squares	df	Mean Square	F-value	p-value	
Model	1446.00	2	723.00	90.37	< 0.0001	significant
A-Tween 80	363.00	1	363.00	45.37	< 0.0001	
B-SLS	1083.00	1	1083.00	135.37	< 0.0001	
Residual	72.00	9	8.00			
Lack of Fit	1.33	1	1.33	0.1509	0.7078	not significant
Pure Error	70.67	8	8.83			
Cor Total	1518.00	11				

➤ The contour graph can give accurate more optimization and prediction of response.

4. OPTIMIZATION (Table 2.4)

Constraints

Name	Goal	Lower Limit	Upper Limit	Lower Weight	Upper Weight	Importance
A:Tween 80	is in range	1	1.95	1	1	3
B:SLS	is in range	1	2.91	1	1	3
Solubility	is in range	75	85	1	1	3

Solutions

4 Solutions found (Table 2.5)

Number	Tween 80	SLS	Solubility	Desirability	
1	1.942	2.901	75.214	1.000	Selected
2	1.923	2.885	75.034	1.000	
3	1.904	2.901	75.000	1.000	
4	1.939	2.871	75.056	1.000	

CONCLUSION

From the above data, we can optimize the combination of sufactants like tween 80 and sodium lauryl sulfate to get the maximum solubility above 75% was found to be in range of 1.942 and 2.901.

# REPORT ON THE YOGA CLASS CONDUCTED (2019-2020)

Venue: Auditorium

Resource person:　　Sr. Infant Tresa, Yoga Instructor, Nirmala Medical Yoga Centre , Muvattupuzha

Students Attended: First Pharm D and First B.Pharm.

Total number students benifited:89

Topic : Yoga : Methods, types and philosophy

The add-on course on basic yoga and meditation was organised by the institution in collaboration with Nirmala yoga teachers training centre both theory and practical was arranged for first year B Pharm and Pharm D students.The professional yoga teacher Sr. Infant Tresa was appointed as the instructor. The class commenced on 24/09/2019.Sister delivered a class on theoretical back ground and significance of yoga for two hours. The practical training was arranged there in every week with a minimum of two sessions for total the duration of 30 hr, at the end of the session exam was conducted for students and a course completion certificate awarded to those who successfully completed the course.
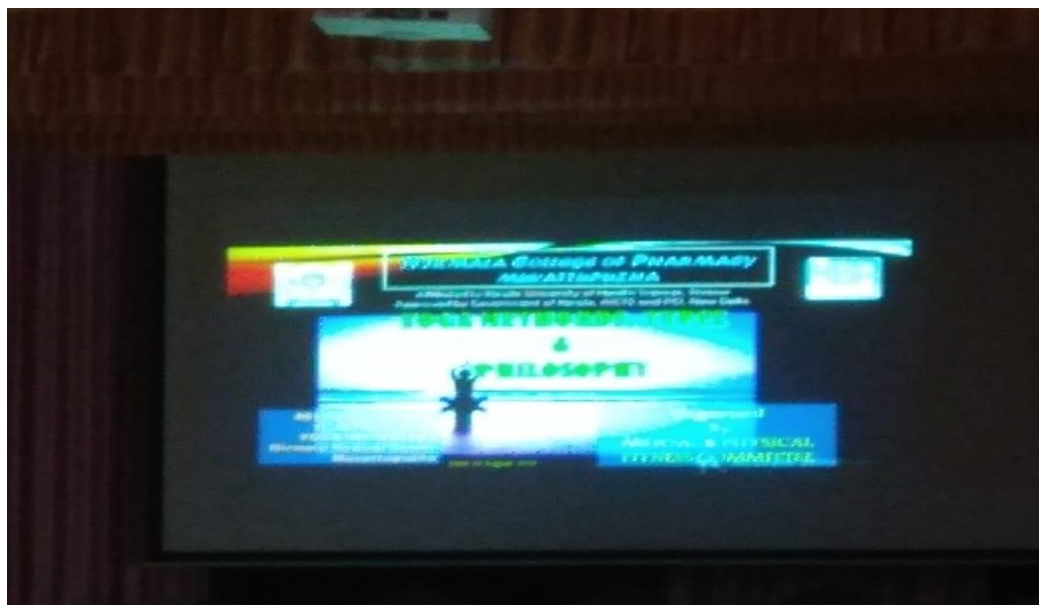
Sr. Infant Tresa delivering the lecture on theoretical aspects of yoga

Feedback link: First semester B Pharm (2019-2023): https://forms.gle/cyBEzPUfAHfgzhjt9

First year pharm D (2019-2025): https://forms.gle/2cksTQ3Dt8hZsSJE6

ADD-ON COURSE EXAMINATION MARK SHEET AND RESULTS (AY:2019-2020)

NAME OF ADDON COURSE: BASIC COURSE IN YOGA AND MEDITATION

Sl No	Adm No	Student Name	Program of study	Batch Name	Semester/Year	Section A (20 Marks)	Section B (30 Marks)	Total out of 50 Marks	Percentage of Marks	Result (Pass/Fail)
1.	1200	Abhiraj Raveendran	B Pharm	2019-2023	First semester	15	15	30	60	Pass
2.	1170	Aleena Raju	B Pharm	2019-2023	First semester	16	14	30	60	Pass
3.	1192	Alfeena Yunus	B Pharm	2019-2023	First semester	12	18	30	60	Pass
4.	1190	Alifna Sathar	B Pharm	2019-2023	First semester	15	17	32	64	Pass
5.	1191	Amrith Vishnu A D	B Pharm	2019-2023	First semester	16	16	32	64	Pass
6.	1193	Anaswara Sankar	B Pharm	2019-2023	First semester	14	14	28	56	Pass
7.	1171	Anita Baby	B Pharm	2019-2023	First semester	18	18	36	72	Pass
8.	1206	Anitta Saji	B Pharm	2019-2023	First semester	14	16	30	60	Pass
9.	1194	Anitta Trissa Antony	B Pharm	2019-2023	First semester	12	18	30	60	Pass
10.	1207	Anju Boban	B Pharm	2019-2023	First semester	12	17	29	58	Pass
11.	1173	Ann Mary George	B Pharm	2019-2023	First semester	16	17	33	66	Pass
12.	1172	Ann Mariya Jose	B Pharm	2019-2023	First semester	9	17	26	52	Pass
13.	1162	Antony V R	B Pharm	2019-2023	First semester	17	13	30	60	Pass
14.	1163	Anupama Wilson	B Pharm	2019-2023	First semester	17	17	34	68	Pass
15.	1212	Anziya P A	B Pharm	2019-2023	First semester	14	14	28	56	Pass
16.	1174	Archana Remesh	B Pharm	2019-2023	First semester	15	14	29	58	Pass
17.	1208	Ashly Davis	B Pharm	2019-2023	First semester	17	17	34	68	Pass
18.	1218	Ashni S	B Pharm	2019-2023	First semester	16	18	34	68	Pass
19.	1209	Athira Vijayan	B Pharm	2019-2023	First semester	16	14	30	60	Pass
20.	1175	Aysha Saja P.S	B Pharm	2019-2023	First semester	16	17	33	66	Pass
21.	1195	Beema Mol As	B Pharm	2019-2023	First semester	16	15	31	62	Pass
22.	1176	Beema Ummer	B Pharm	2019-2023	First semester	17	18	35	70	Pass
23.	1177	Binsha Urumees	B Pharm	2019-2023	First semester	9	17	26	52	Pass
24.	1196	Deepthi Subramanian	B Pharm	2019-2023	First semester	17	16	33	66	Pass
25.	1178	Denila Shaji	B Pharm	2019-2023	First semester	18	18	36	72	Pass
26.	1216	Devika Ramakrishnan	B Pharm	2019-2023	First semester	16	17	33	66	Pass
27.	1164	Elsa Paul	B Pharm	2019-2023	First semester	16	17	33	66	Pass
28.	1197	Gadha T	B Pharm	2019-2023	First semester	17	17	34	68	Pass
29.	1201	Gourisree T	B Pharm	2019-2023	First semester	14	16	30	60	Pass

30.	1202	Hafsamol Nazer	B Pharm	2019-2023	**First semester**	16	17	33	66	Pass
31.	1179	Heleena Alex	B Pharm	2019-2023	**First semester**	13	17	30	60	Pass
32.	1180	Irin Rose Paul	B Pharm	2019-2023	**First semester**	11	18	29	58	Pass
33	1210	Jennifer Ann Joy	B Pharm	2019-2023	**First semester**	18	18	36	72	Pass
34	1219	Jisna Joy	B Pharm	2019-2023	**First semester**	12	18	30	60	Pass
35	1165	Jithesh M R	B Pharm	2019-2023	**First semester**	15	15	30	60	Pass
36	1211	Jithin Sunny	B Pharm	2019-2023	**First semester**	14	16	30	60	Pass
37	1181	Jobins Biju	B Pharm	2019-2023	**First semester**	13	18	31	62	Pass
38	1205	Mahima Francis	B Pharm	2019-2023	**First semester**	9	20	29	58	Pass
39	1221	Mariya Sunny	B Pharm	2019-2023	**First semester**	15	14	29	58	Pass
40	1182	Meenu Thomas	B Pharm	2019-2023	**First semester**	14	16	30	60	Pass
41	1168	Megha Jose	B Pharm	2019-2023	**First semester**	16	18	34	68	Pass
42	1203	Merin K Varghese	B Pharm	2019-2023	**First semester**	17	23	40	80	Pass
43	1183	Muneera PM	B Pharm	2019-2023	**First semester**	16	19	35	70	Pass
44	1198	Navya Joseph	B Pharm	2019-2023	**First semester**	16	17	33	66	Pass
45	1184	Nidhin T Paul	B Pharm	2019-2023	**First semester**	14	18	32	64	Pass
46	1166	Nikhila K Zidic	B Pharm	2019-2023	**First semester**	16	17	33	66	Pass
47	1185	Ninsi George	B Pharm	2019-2023	**First semester**	12	19	31	62	Pass
48	1214	Reena Hembrom	B Pharm	2019-2023	**First semester**	17	19	36	72	Pass
49	1204	Reshma Ann Roy	B Pharm	2019-2023	**First semester**	18	20	38	76	Pass
50	1169	Revathi Ajithkumar K E	B Pharm	2019-2023	**First semester**	18	18	36	72	Pass
51	1167	Sandra Sibi	B Pharm	2019-2023	**First semester**	12	16	28	56	Pass
52	1186	Sangeetha Sukumaran	B Pharm	2019-2023	**First semester**	15	17	32	64	Pass
53	1199	Shaniya Salim	B Pharm	2019-2023	**First semester**	14	14	28	56	Pass
54	1217	Sreelakshmi R	B Pharm	2019-2023	**First semester**	13	17	30	60	Pass
55	1187	Susan Baiju	B Pharm	2019-2023	**First semester**	15	17	32	64	Pass
56	1220	Taniya Benny	B Pharm	2019-2023	**First semester**	15	14	29	58	Pass
57	1215	Varsha Elizabeth Joby	B Pharm	2019-2023	**First semester**	15	15	30	60	Pass
58	1189	Varsha V Chandra	B Pharm	2019-2023	**First semester**	18	21	39	78	Pass
59	1245	Aleena Benoy	Pharm D	2019-2025	**First Year**	20	17	37	74	Pass
60	1222	Amy Thankachan	Pharm D	2019-2025	**First Year**	18	18	36	72	Pass
61	1238	Angelin Jaimon Augustine	Pharm D	2019-2025	**First Year**	16	18	34	68	Pass
62	1246	Anjaly Saji	Pharm D	2019-2025	**First Year**	17	12	29	58	Pass
63	1239	Archa S Nair	Pharm D	2019-2025	**First Year**	14	15	29	58	Pass
64	1225	Ashna Joy	Pharm D	2019-2025	**First Year**	15	14	29	58	Pass
65	1226	Dona Basil	Pharm D	2019-2025	**First Year**	19	13	32	64	Pass
66	1227	Elizabeth Rachal James	Pharm D	2019-2025	**First Year**	17	12	29	58	Pass
67	1240	Elmy Issac John	Pharm D	2019-2025	**First Year**	18	14	32	64	Pass
68	1241	Farzana Nazar	Pharm D	2019-2025	**First Year**	18	17	35	70	Pass
69	1228	Goutam Gopakumar	Pharm D	2019-2025	**First Year**	12	17	29	58	Pass
70	1242	Jisa Elizabath Sabu	Pharm D	2019-2025	**First Year**	14		14	28	Pass
71	1248	Jismy Jaison	Pharm D	2019-2025	**First Year**	15		15	30	Pass

2

72	1243	Josna C Jayan	Pharm D	2019-2025	**First Year**	21	14	35	70	Pass
73	1229	Linette Sabu	Pharm D	2019-2025	**First Year**	17	15	32	64	Pass
74	1249	M P Fida Firdouse	Pharm D	2019-2025	**First Year**	18	21	39	78	Pass
75	1250	Niveena Varghese	Pharm D	2019-2025	**First Year**	18	17	35	70	Pass
76	1230	Parvathy B Nair	Pharm D	2019-2025	**First Year**	18	18	36	72	Pass
77	1231	Pooja Raj AB	Pharm D	2019-2025	**First Year**	17	14	31	62	Pass
78	1251	Siyana Rahim	Pharm D	2019-2025	**First Year**	17	15	32	64	Pass
79	1233	Sneha Roy	Pharm D	2019-2025	**First Year**	19	21	40	80	Pass
80	1234	Sona Vincent	Pharm D	2019-2025	**First Year**	19	14	33	66	Pass
81	1235	Sreelakshmi Sreekumar	Pharm D	2019-2025	**First Year**	19	15	34	68	Pass
82	1232	Shefin Siby	Pharm D	2019-2025	**First Year**	18	21	39	78	Pass
83	1236	Stebin Mathew	Pharm D	2019-2025	**First Year**	18	14	32	64	Pass
84	1237	Aleena Elsa Jaccob	Pharm D	2019-2025	**First Year**	17	15	32	64	Pass
85	1223	Aneeta Baiju	Pharm D	2019-2025	**First Year**	18	21	39	78	Pass
86	1247	Aswarya Shiji	Pharm D	2019-2025	**First Year**	18	14	32	64	Pass
87	1244	Mebel Augstine	Pharm D	2019-2025	**First Year**	17	15	32	64	Pass
88	1188	Tansya Babu	Pharm D	2019-2025	**First Year**	14	21	35	70	Pass
89	1224	Anjana Raj	Pharm D	2019-2025	**First Year**	15	15	30	60	Pass

Name and Signature Course Coordinator : Dr.Deepa Jose

3

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Affiliated to Kerala university of Health sciences Thrissur
Approved by Government of Kerala, AICTE and PCI, New Delhi

AY 2018-2019

Add on course report Submitted to Head of the department

Name of add on course: **Sigma Plot a statistic Tool**

Course Organised for : M Pharm Students

Number of students Enrolled: 9

Number of students Completed: 9

Date of starting the course: 18/12/18

Date of completion: 27/02/19

Number of Hours Class conducted: 35hrs

Assessment Method carried Out: Assignment Report

Course Coordinator: Dhanish Joseph

Dhanish Joseph

for.

Dr. Daijo Dasie

NIRMALA COLLEGE OF PHARMACY, MUVATTUPUZHA

Affiliated to Kerala university of Health sciences Thrissur
Approved by Government of Kerala, AICTE and PCI, New Delhi

Submitted by:

Name: Betsy Sunny

Roll number: 1

Program M Pharm

March 2019

1.1 INTRODUCTION TO BIOSTATISTICS

SUMMARY Biostatistics are the development and application of statistical methods to a wide range of topics in biology. It encompasses the design of biological experiments, the collection and analysis of data from those experiments and the interpretation of the results.

Probability value (P value): The level at which statistical significance occurs from a finding. It reflects the strength of the results found in a study and determines the likelihood that results were due to chance.

A null hypothesis is a hypothesis that says there is no statistical significance between the two variables. It is usually the hypothesis a researcher or experimenter will try to disprove or discredit. An alternative hypothesis is one that states there is a statistically significant relationship between two variables.

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One way annova: The one-way analysis of variance is used to determine whether there are any statistically significant difference between the means of 2 or more independent groups; used to compare 2 or more samples.

ASSIGNMENT

The disintegration times (min) of 4 different batches of immediate release tablet are given below. identify which batches are similar.(Table 2.6)

D.T 1	D.T.2	D.T.3	D.T.4
1	3.5	2.5	1.8
1.5	4.5	3.5	2.4
2	3.6	4.1	2.3
3	5.1	2.4	3.1
1.5	3.2	3.1	3.8

Sunday, March 17, 2019, 22:31:17

REPORT
One Way Analysis of Variance

Data source: Data 1 in Notebook1

Normality Test (Shapiro-Wilk):   Failed   (P < 0.050)

Test execution ended by user request, ANOVA on Ranks begun

Sunday, March 17, 2019, 22:31:17

Kruskal-Wallis One Way Analysis of Variance on Ranks

Data source: Data 1 in Notebook1

Group	N	Missing	Median	25%	75%
D.T.1	5	0	1.500	1.250	2.500
D.T.2	5	0	3.600	3.350	4.800
D.T.3	5	0	3.100	2.450	3.800
D.T.4	5	0	2.400	2.050	3.450

$H = 11.454$ with 3 degrees of freedom. (P = 0.010)

The differences in the median values among the treatment groups are greater than would be expected by chance; there is a statistically significant difference (P = 0.010)

To isolate the group or groups that differ from the others use a multiple comparison procedure.

All Pairwise Multiple Comparison Procedures (Tukey Test):

Comparison	Diff of Ranks	q	P	P<0.050
D.T.2 vs D.T.1	61.500	4.649	0.006	Yes
D.T.2 vs D.T.4	36.500	2.759	0.207	No
D.T.2 vs D.T.3	22.000	1.663	0.642	Do Not Test
D.T.3 vs D.T.1	39.500	2.986	0.149	No
D.T.3 vs D.T.4	14.500	1.096	0.866	Do Not Test
D.T.4 vs D.T.1	25.000	1.890	0.540	Do Not Test

Note: The multiple comparisons on ranks do not include an adjustment for ties

One way annova: The one-way analysis of variance is used to determine whether there are any statistically significant difference between the means of 2 or more independent groups; used to compare 2 or more samples.

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D.T 1	D.T.2	D.T.3	D.T.4
1	3.5	2.5	1.8
1.5	4.5	3.5	2.4
2	3.6	4.1	2.3
3	5.1	2.4	3.1
1.5	3.2	3.1	3.8

REPORT
One Way Analysis of Variance

Sunday, March 17, 2019, 22:31:17

Data source: Data 1 in Notebook1

Normality Test (Shapiro-Wilk): Failed (P < 0.050)

Test execution ended by user request, ANOVA on Ranks begun

Kruskal-Wallis One Way Analysis of Variance on Ranks

Sunday, March 17, 2019, 22:31:17

Data source: Data 1 in Notebook1

Group	N	Missing	Median	25%	75%
D.T.1	5	0	1.500	1.250	2.500
D.T.2	5	0	3.600	3.350	4.800
D.T.3	5	0	3.100	2.450	3.800
D.T.4	5	0	2.400	2.050	3.450

$H = 11.454$ with 3 degrees of freedom. (P = 0.010)

The differences in the median values among the treatment groups are greater than would be expected by chance; there is a statistically significant difference (P = 0.010)

To isolate the group or groups that differ from the others use a multiple comparison procedure.

All Pairwise Multiple Comparison Procedures (Tukey Test):

Comparison	Diff of Ranks	q	P	P<0.050
D.T.2 vs D.T.1	61.500	4.649	0.006	Yes
D.T.2 vs D.T.4	36.500	2.759	0.207	No
D.T.2 vs D.T.3	22.000	1.663	0.642	Do Not Test
D.T.3 vs D.T.1	39.500	2.986	0.149	No
D.T.3 vs D.T.4	14.500	1.096	0.866	Do Not Test
D.T.4 vs D.T.1	25.000	1.890	0.540	Do Not Test

Note: The multiple comparisons on ranks do not include an adjustment for ties

A result of "Do Not Test" occurs for a comparison when no significant difference is found between the two rank sums that enclose that comparison. For example, if you had four rank sums sorted in order, and found no significant difference between rank sums 4 vs. 2, then you would not test 4 vs. 3 and 3 vs. 2, but still test 4 vs. 1 and 3 vs. 1 (4 vs. 3 and 3 vs. 2 are enclosed by 4 vs. 2: 4 3 2 1). Note that not testing the enclosed rank sums is a procedural rule, and a result of Do Not Test should be treated as if there is no significant difference between the rank sums, even though one may appear to exist.

CONCLUSION

The differences in the median values among the treatment groups are greater than would be expected by chance; there is a statistically significant difference (P = 0.010)

And found to be no significant difference between rank sums 4 vs. 2, then you would not test 4 vs. 3 and 3 vs. 2, but still test 4 vs. 1 and 3 vs. 1 (4 vs. 3 and 3 vs. 2 are enclosed by 4 vs. 2: 4 3 2 1)and these batches are similar also.